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Globalization and Economic Integration

Edited by
Bruno Dallago and Sara Casagrande

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Guest Editors

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About the Editors

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Bruno Dallago, PhD, is Professor of Economics at the Department of Economics and Management, University of Trento, Italy. He was a visiting professor at various universities, including the University of California at Berkeley, the University of North Carolina at Chapel Hill, Hitotsubashi University, Kyoto University, Corvinus University of Budapest, Zhejiang University, and Tshwane University of Technology at Pretoria. He was the president of the European Association for Comparative Economic Studies (1995-1996), consultant to international organizations, and a member of various international journal and scientific evaluation and advisory boards. His research interests include the European Union, comparative economic systems, globalization and integration, the transforming economies of Central and East Europe, entrepreneurship and small and medium-sized businesses, and local economic development. He is the author of more than 150 journal articles and author and editor of several scholarly books, including *One Currency, Two Europes* (World Scientific, 2016), *Transformation and Crisis in Central and Eastern Europe: Challenges and Prospects* (with Steven Rosefielde, Routledge, 2016), *A Global Perspective on the European Economic Crisis* (edited with Gerd Guri and John McGowan, Routledge, 2016), *The Routledge Handbook of Comparative Economic Systems* (edited with Sara Casagrande, 2023), and *Industrial Cooperation and the Silk Road: China, Russia and Central Asia and BRI* (edited with Zhikai Wang, 2026, forthcoming).

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Sara Casagrande, Ph.D., is a postdoctoral research fellow in Comparative European Studies. Her research activity focuses on the European integration process, European institutions and institutional variety, and the economic, political, and social prospects of the Eurozone. She is the author of journal articles and presentations at conferences. Among her most recent publications, she is a co-editor of *The Routledge Handbook of Comparative Economic Systems* (2023).

Preface

This Reprint collects the articles on globalization and economic integration published in the Special Issue of the *Journal of Risk and Financial Management*. The choice of topic was directly related with different events—including the emergence of new economic and political powers, the international crisis, the COVID-19 pandemic, the revival of geopolitical and geostrategic conflicts, the emergence of protectionist policies, the difficulties met by integration processes, and the crisis of international organizations—that fostered processes leading to the crisis of the US-led international economic order. Globalization was largely the distinct mark of the latter, along with a significant degree of economic integration among countries and economic and social agents.

This Reprint explores features, trends, and challenges of globalization and its coevolution with economic integration processes, including the working of markets in that context. It analyzes the processes that were put in motion by the crisis of the global system and the forces leading these processes. These include the role of emerging and developing countries, the dilemma of efficiency vs. vulnerability, the difficulties met by integration processes, the influence of corruption on innovation, market volatility and stock returns, the consequences of income inequality, migration, financialization and sovereign investors, foreign direct investment, customs risk management, multipolarity, sanctions, and protectionism. These forces and processes, individually and jointly, may destructure the unipolar global and integrated system and lead to a multipolar world economy. They may also question the resilience of regional integration processes, with consequences for financial and labour markets, international trade and finance, value chains, and policy making. Given the complex and multifaceted nature of the issues involved, this Reprint presents contributions from different branches and perspectives of economics and from authors from a variety of theoretical and methodological approaches, countries and experiences.

The Reprint is addressed to scholars who are interested in understanding whether the ongoing economic and geopolitical processes jeopardize globalization and integration or whether their management requires different approaches and new strategies. It is also of interest for policy makers and businessmen, particularly those who think that in the present circumstances, a long-term and complex perspective is necessary to understand the issues and manage the processes.

Bruno Dallago and Sara Casagrande
Guest Editors

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Editorial

Introduction: Globalization and Economic Integration

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1. Introduction

The purpose of this Special Issue is to explore the challenges and trends of the process of globalization and its coevolution with integration processes in different parts of the world. It also aims to analyze the forces pushing towards economic integration, disintegration, decoupling, de-risking and confrontation. Particular attention is paid to the processes that are leading to a multipolar world economy and that may call into question the resilience of regional integration processes, such as the European Union (EU). The consequences for financial markets, labour markets, international trade, value chains and policy making are also considered.

The main question addressed in this Special Issue is whether the ongoing processes in the international economy, also in relation to geostrategic and political developments, jeopardize globalization and integration or whether they require different approaches or offer new opportunities.

In particular, this Special Issue is attempting to host and coordinate contributions from different brands of economics, spanning from standard yet innovative macro- and microeconomic approaches through to political economy, institutional economics and development and management studies. The nature of globalization and integration is extremely complex and multifaceted, and their interrelations are also multiple and non-linear, with feedback and circular processes playing a prominent role. This requires that, along with duly exploiting the advantages of disciplinary specialization, we also aim to gesture towards the need for, and the advantages of, a deeper and more coordinated interaction between different relevant disciplines and approaches.

Globalization and integration processes underwent a profound evolution and transformation in recent decades. The emergence of new global players both at the regional (South and East Asia) and national level (BRICS), as well as at the microeconomic level (value chains, emerging multinationals), together with social, political, economic, health and geopolitical events, seems to lead towards a multipolar world economy. Western capitalist countries and emerging countries of the East and the South seem determined to take different paths, following divergent national interests. Well established integration processes, such as the EU, have difficulty managing the heterogeneity of its member countries and disruptive international events, as well as reconciling national interests with community objectives. More recent integration processes, such as the Shanghai Cooperation Organization (SCO) and the BRICS, together with their multilateral institutions, are apparently strengthening the role of the East and the South in the international economy and politics, in contrast with West-dominated globalization and integration and Western institutions.

Do these forces and processes advance a new organization and governance of globalization and integration, or do they lead to disrupting globalization and making disintegration prevail? Do they, and the new attempts at area integration, represent important steps in the

ongoing dispute for dominance over the world economy? Or do they represent the building blocks of a new, multipolar international order? What will the gains and the losses be? What are the roles of demography, innovation, technology, skills and education, inequalities and mobility in these new scenarios? How will labour markets, financial markets and international trade evolve? How will the role of international institutions change?

The purpose of this Special Issue is to answer these and possibly other questions, and to investigate the nature of globalization and integration after years of exogenous and endogenous shocks and conflicts. This Special Issue also aims at analyzing the evolving features of globalization and integration and their differences with respect to globalization at the end of the 20th century, their coevolution with integration processes, and the reactions to recent challenges.

The 17 papers that compose this Special Issue clearly demonstrate how globalization and integration are processes that reveal opportunities, challenges and vulnerabilities that make convergence far from certain, and can prevent, impede or revolutionize future integration and globalization processes. After discussing the meaning and interconnection between globalization, integration and convergence in Sections 2 and 3, Section 4 summarizes the relevant themes of the papers in the Special Issue. Finally, Section 5 provides concluding remarks.

2. Different Views of Globalization

The term "globalization" is first attested in the 1920s (Axford, 2013). However, the term became popular in the 1990s, referring to a set of processes often considered to be irreversible and deeply linked to important technological breakthroughs, particularly in communication and information technologies (Martell, 2010). As a matter of fact, globalization is a more complex phenomenon based on much wider, more complex and far-reaching premises.

Globalization refers to the organization, governance and management of the world economy based on various fundamental institutional, political and technological features. The concept of globalization is multifaceted (Gygli et al., 2019), but its central characteristic is that of a worldwide process of socio-economic integration, interaction and interdependence based on the elimination of barriers to trade, the flow of capital, the movement of people, and the free circulation of ideas and technology. The corollary to these freedoms is the necessity to define and protect the rights of those who might be harmed, particularly with respect to their property rights, by people moving to and investing in other countries. In a sense, globalization requires the attenuation of the sovereignty of countries in exchange for the economic, political and social advantages that globalization creates. Embedded in the concept of globalization and its advantages is the commitment that it also promotes economic, institutional and policy convergence.

Globalization, by definition, requires the participation and the cooperation of a significant proportion of the world's countries and economic and political agents, including international institutions, governments, forms and consumers, which govern, support and contribute to the continuous cross-border exchange of resources, capital flows, knowledge and the production of goods and services. This requires the evolution of a new international division of labour and specialization, as well countries' adaptation to it, based on processes of liberalization and the free flow of tangible and intangible resources and goods, including trade and the free movement of commodities, ideas and people. This contributes to the accelerated growth of economic activity across national and regional political boundaries, involving the increased movement of ownership rights, via trade and investment, and of people, via migration (Cernat, 2006). Creating trans-border networks of connections among economic, political and social actors, mediated through a variety of flows of people,

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information and ideas, capital, and goods, is also fundamental (Gygli et al., 2019). This must be accompanied by political and social processes spreading and coordinating worldwide policy making approaches, values and prices, ideas and information (Dreher, 2006; Nye & Keohane, 2000). Fundamental preconditions for unbounding these processes are the cross-border liberalization and simplification of economic activity. Effective incentives to global economic processes are also fundamental, including the international protection of capital and labour and the income they produce across borders, properly regulated at the international level and by the pressure of competition.

These fundamental issues notwithstanding, various views of globalization exist among scholars. The supporters of the "hyper-globalization" perspective (as Rodrik, 2011 defines it) see globalization as a linear and irreversible development of global capitalism, supported by the continuous liberalization and interconnection of the world economy, particularly since the 1990s and 2000s (Anderson & Obeng, 2021). Neoliberal economic policies are seen as providing fundamental support to this endless development, together with democratic political systems and the abating of national states, with the desirable perspective of also extending it to developing countries (Friedman, 2000, 2005). This view extends the process, in line with liberal democracy, to explain the "end of history" (Fukuyama, 1989).

An opposing, and now dominant, view considers globalization as an undulating process steered by the interests of dominant countries and capitalists, policies and technological development, followed by reversals and declining phases driven by crises and political reversals (Szul, 2010; Ng & Pitakdumrongkit, 2023), with a particularly important role played by the international financial crisis of 2008 (James, 2018; Baldwin et al., 2023; Thakur-Weigold & Miroudot, 2024; Arimura & Sugino, 2024). Taking a more balanced position, other authors recognize the importance of globalization, but stress significant negative aspects and consequences, including inequalities and the prominence of cluster-based economic growth (Stiglitz, 2002; Tadić, 2006; Rodrik, 2011; Dreher, 2006; Milanovic, 2003; Gozgor & Ranjan, 2017).[1] Finally, a different strand of literature aims at measuring levels of globalization by means of composite indexes, an example of which is KOF Globalization (Dreher, 2006; Dreher et al., 2008; Gygli et al., 2019), a composite index for measuring the economic, social and political dimensions of globalization since 1970, the purpose of which is to offer a ranking of world countries according to their level of globalization.

The basic political and economic precondition of globalization is the real or reputed existence of a unique world economy under the dominance of one hegemonic country or a coordinated group of powerful countries. The countries participating in globalization share a reference currency and rely on the overview and support of an internationally accepted system of international organizations setting and enforcing the rules of economic interaction. In the 1990s, this was made possible by several major events: the inclusion of the former "second world" following the successful end of decolonization, which transformed previous colonies into sovereign states; the disruption of the socialist system in Central and Eastern Europe; and far-reaching market reforms in China.[2] A second precondition, strictly linked to the aforementioned, was the stipulation of a set of international agreements leading to the definition and establishment of a coherent international institutional framework. The core of this system was defined in Bretton Woods by the allied powers (essentially, the United States and Great Britain) at the end of WWII, and included the United Nations system with its specialized organizations (in particular, the World Bank, the International Monetary Fund and the GATT, transformed into the World Trade Organization in 1995).

Technology and technical development have also played a relevant role. First, a new form of technology, based partly on electronic solutions and partly on technical standardization, offered the possibility for new technical solutions and lower costs for those firms taking the risk of being significant contenders in the international arena. This development

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implied that countries and firms involved in globalization shared a unique technological system with unique technical standards and compatibilities. These new technologies offered a worldwide technical solution for the prompt, cheap and reliable international delivery of information and communication and for the transportation of goods and services (such as ICT and containers). However, standardization was also important in the sense that goods and services could be divided into numerous components produced and accepted worldwide, through a process involving the convergence of technical solutions and rules that led to the formation of transnational value chains, and made foreign goods usable in different countries (including electrical plugs and adaptors, cars' safety and pollution standards, service stations and spare parts, and many others) (David & Greenstein, 1990; Tassey, 2015). These solutions, together with the transformation of financial markets and scale and scope economies, opened the way for the concentration of capital in large transnational companies (TNCs) and the formation of truly international markets. In short, different local and national economic systems had to be integrated, technical systems had to be at least compatible and political and legal systems had to be inter-penetrable via shared principles and fundamental rules.

3. Globalization, Integration and Convergence

Globalization and integration have been leading concepts in the post-war decades, encompassing economic, political and social domains around the world. Their dominance increased further after the successful end of the decolonization movement and the transformation of former socialist countries into capitalist market economies. They acquired fundamental importance in explaining and managing modern economies and polities, usually coupled with the idea of convergence, either explicitly or implicitly.

The connections between the three concepts, however, is controversial, and the empirical evidence is unclear. The evidence of a causal relationship among the three processes and of worldwide convergence is elusive. Research highlights that similarities in the growth paths of GDP per capita are clear in the case of cluster of countries, but not worldwide (Casagrande & Dallago, 2024). Different clusters of countries have been identified, each one including countries growing at a similar pace and reacting in a similar way in periods of crisis and under the effects of policy making.

Convergence has traditionally been a subject of debate among social scholars and policy makers. In the economic literature, convergence is generally intended to convey a process of decreasing differences among countries according to several important parameters generally linked to the effect of globalization: catching up in terms of GDP per capita (Abramovitz, 1986), welfare (Ghirmay, 2014), interest rates and prices (Streeten, 2001), business cycle synchronization (Lopez et al., 2021) or institutions (Dallago et al., 1992).

These developments were necessary, yet insufficient. The possibility of producing goods and services in a different way, owing to institutional preconditions and technologies for the flourishing of globalization, also required a great deal of reorganization of production processes, financing and trade. This, in turn, depended on the willingness and capacity of the different constituents involved in the changes to adopt these changes. This included the willingness of national governments and businesses to take the opportunity, which depended on the willingness of the former to weaken national control over economic and financial activities and in part over technology, and of the latter in ceding control over finished products and their marketing and to be part of global value chains (GVCs). Moreover, users and consumers were obliged to accept goods and services with new technical and marketing features, produced in different ways and, in large part, in other countries.

Particularly important were changes in the production process, which was split according to components produced by the most efficient producer, independently of their

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location, and exported to the rest of the world by means of container and an efficient global transportation system. The production of complex goods, such as cars or computers, consisted in the locationally dispersed, yet coordinated, production of a set of components[3] which were typically assembled at the end of the process by the company which owned the brand of the product and often also the project, thereby capturing the most value.[4] Value chains typically include all the stages of production, including the design, marketing and distribution of the final product. These systems are usually called GVCs to emphasise the worldwide dispersion of the production locations, together with their carefully coordinated nature (Cigna et al., 2022; WTO, 2023).

The organization of production along the GVC standard creates significant benefits, including lower prices for consumers, but also displace workers and businesses that are outcompeted by the new organization. The specialization of countries and their industries became much more refined, competition keener and the interdependence of countries and industries much stronger. Consumers benefitted significantly in terms of lower prices and a wider variety of goods, which were also of higher quality. The integration of countries and industries had important consequences for policies, which could become more effective thanks to the greater synchronization of business cycles. However, the integration of financial markets also created greater fragility and exposure to systemic crises, as the international financial crisis of 2008–2009. As to the integration of real markets and of production, it is safe to say that integration proved to be a hindrance only in the case of lock-downs due to the COVID-19 pandemic and war and sanctions, but not because of financial meltdowns. Whether the final result is more favourable or detrimental for workers depends largely on the nature of the technology, that is, whether the technology in question is labour-augmenting or labour-replacing (Acemoglu & Johnson, 2023; Acemoglu & Restrepo, 2019; Frey, 2019). This clearly has important policy and institutional consequences.

The concept of integration is loose and multifaceted. Integration may be both a process accompanying globalization, and typically refers to markets, and a more limited but deeper process involving a subset of the world economy and society, typically a group of contiguous countries. In the former case of international economic integration, integration consists of increasingly stricter cooperation among the world economies through shared international institutions establishing and enforcing rules aimed at guaranteeing a levelled playing field for cooperation and competition. Within these fora, participating countries negotiate the dismantling of barriers that prevent or impede further integration. Technical standardization is also necessary, in order to make different components and goods and services compatible, and for the protection of expatriated assets (for example, people, capital or property rights). This solution is powerful, yet economically constrained. As the various versions of the so-called impossible trinity clarify (see Note 6), when economies are deeply integrated in a globalized world, economic policies face the limitation of having to choose only two out of the three institutional settings relevant for policy making.

In its second sense, integration implies agreements among participating countries that only involve the latter. This regional integration consists of an arrangement among a group of countries based on the reduction or the elimination of barriers to mutual trade, including the partial or full abolition of tariff and non-tariff restrictions on trade, and the coordination or unification of trade, monetary and fiscal policies. The final aim is to reduce costs for producers and prices for consumers, and consequently to increase welfare and mutual trade and improve competitiveness for the firms and economies involved. While international integration as a part of globalization creates global trade, regional integration promotes trade among participating countries, possibly diverting trade from the rest of the world. While global integration generates advantages for all (at least on the assumption that all of the countries in question are similarly competitive), regional integration reserves

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advantages for the group of participating countries, or may represent a defensive reaction vis-à-vis globalization. While, in this sense, regional integration is more limited, it is also more profound, in the sense that it may align monetary and fiscal policies, thus connecting the participating economies more strictly than in the case of international integration. Yet, if only indirectly, a flourishing club of integrated countries is likely to create—in a globally integrated world economy—advantages for all in the form of higher imports, flows of FDIs and the like. Ultimately, and provided that the world economy is globally integrated and in a second-best perspective, the differences between the economic outcomes of the two types of integration for the world economy are probably few, if indeed there are any. The case of the EU is symptomatic in this sense (Akram & Rashid, 2016; Mattoo et al., 2019).

The issue of regional integration is different from that of globalization, as well as being less complex, in that it involves only a limited number of countries, usually also more politically intimate. Typically, countries are neighbours which share significant trade, social and cultural exchanges, institutional similarities and compatibilities, and common economic and political interests, including in regional stability and environmental sustainability. While the general and particular conditions for integration appear more definite than in the case of globalization, integration is also more demanding. In fact, it consists of much more foundational changes that impinge on the basic institutions and structures of the countries involved, starting from the implementation of a blueprint for dismantling national entitlements, while building new shared or coordinated claims. Progress is consequently slower, and backlashes may be far-reaching and challenging to solve.

The particular features and consequences of integration depend on its particular nature. In the simplest case, namely, a free trade area, integration consists mainly in the abolition of restrictions to the free circulation of goods and services. Custom unions consist of a free trade area with a common trade policy. A common market includes a customs union with the free circulation of factors, while an economic community adds common or coordinated policies. Finally, the most demanding and ambitious form of economic integration, namely, an economic and monetary union, upgrades an economic union with common economic and monetary institutions and policies—above all, a single market and a single external tariff. An important feature of the most ambitious forms of integration is that participating countries accept to concede part of their sovereign powers to the advantage of purposefully set-up organs, such as a common central bank with sovereignty over monetary management and policies, in the case of a monetary union. Integration may then continue by attaining the political union, thus also changing the form of the state.

Integration has several consequences for the countries involved, some advantageous and some disadvantageous. Trade creation and trade diversion are important consequences, as much as the attraction of foreign direct investments (FDIs) both from within and outside the integrated area, duly attracted by, respectively, lower transaction costs and enlarged markets. Integration favours trade in the internal market of the integrated area, to the disadvantage of trade with external countries and firms, particularly if the integrated market coincides with a monetary union. For this reason, a monetary union, such as the EU, has been interpreted both as a defensive reaction to globalization and as an enhancement of globalization within Europe (Wincott, 2000). At the same time, dismantling barriers to trade, such as tariffs in the internal market, fosters and strengthens competition and favours the exploitation of scale and scope economies. Integration through lifting barriers between countries decreases transaction costs. Risks relative to economic and commercial activities may also decrease, such as risk and uncertainty relative to exchange rates in the case of a monetary union. Owing to the expansion of trade relations and production cooperation through FDIs, integration is likely to synchronize business cycles among countries, which

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allows for the coordination of policies. Finally, integration creates favourable conditions for specialization and vertical intra-industrial trade within the area.

Integration may also be accompanied by disadvantages, particularly when it remains incomplete or when its institutional and policy architectures are asymmetric. This may cause institutional ineffectiveness, for instance, when the competences of different organs (national or common) overlap or when incompleteness causes cases of institutional void. It may also cause policy ineffectiveness, when policy competences belong in different constituencies—for example, some may belong to national governments, and others to common organs—which may make effective policy coordination difficult. Another problematic consequence of an incomplete and asymmetric integration is that the consequences of common policies or institutions may be disparate for member countries. The solution would be to endow the integration with equalization instruments, i.e., policies that would compensate unintentional losers and tax away undue gains from winners. However, this would require political integration, which is by no means a trivial goal for different countries, however similar or politically intimate they may be. The European Union provides various examples of these problems and of their possible solutions.

The relation between globalization and the process of integration is critical, yet controversial, particularly when convergence is also considered. Although scholars generally agree that international and inter-country agreements for promoting economic integration—including the suppression of barriers and the harmonization of policies—have played an important role in increasing interdependence among countries and businesses, globalization, integration and interdependence are different concepts and processes. Integration demands both open and globalized markets and coordinated international management based on shared rules and practices restraining the power and role of national states (Waltz, 1999). While the expansion of trade creates interdependence, integration also requires supportive institutions and structures, as attested by various transnational integration endeavours, and particularly the EU. Therefore, interdependence does not necessarily lead to integration, if other conditions are missing.

4. The Relation Among the Three Processes

Although the direct and causal relationships between globalization, integration and convergence are not unequivocal, and can be difficult to demonstrate, many scholars maintain that globalization inevitably leads to integration and, through this, to convergence, particularly the convergence of economic indicators. This tradition has a comparatively long history, which includes important contributions by Abramovitz (1986) and Barro and Sala-i-Martin (1992). These authors maintain that the growth rate of countries with lower levels of GDP per capita will be faster and will catch up with more developed countries due to the advantages of the follower (e.g., in terms of technology that can be imported or copied).[5] Quantitative evidence both confirms (Lau et al., 2022) and contradicts (Kenworthy, 1997; Rey & Montouri, 1999; Caggiano & Leonida, 2009) such convergence. Also important is the observation that globalization may support convergence among countries while heightening divergence within them, so that it may not be inappropriate to see in the processes of globalization both an impetus towards convergence and forces that destabilize and create both divergences and great transformations in society and the world order at large (Grinin & Korotayev, 2015). A significant obstacle to full economic integration is that it would also require social and political integration, as well as the convergence of informal institutions, all of which is difficult to obtain.

Nobel laureate Amartya Sen (2002) laid the groundwork for the methodological and philosophical analysis of the relation between what is general and what is particular in the nature of human beings and societies, and the dangers that are engendered by

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disregarding the complex relation between these two apparently opposite, yet intimately linked, essences. Sen (2002, p. 53) emphasises that "it is not possible to attribute to an individual an exclusive identity—or a prevailing one, according to situations—to an exclusive group." This approach highlights the fundamental dilemma of the relation between globalization and integration: While the former has a general—in a sense, public—value, the latter represents a particular and separate—in a sense, private—solution. The former is open and inclusive, whereas the latter is closed and exclusive. How can the two dovetail together? In Sen's (2002, p. 56) words, "When confronted with an alternative, the different loyalties deriving from diverse types of identity may come into conflict on the priorities to be given. . . we have to choose and decide, and the alternative to a reasonable choice is an unreasonable choice."

Are globalization and regional integration incompatible? Both require a choice, by countries and economic, political and social actors. This Special Issue answers that they are not necessarily incompatible, but this is true only under certain conditions. Trade in the case of the EU provides an instructive example. European integration was preceded and accompanied for years by a debate concerning trade diversion and trade creation. The point was that an important formal—institutional and organizational—integration by countries with open economies and sharing important complementarities and affinities would entail further deep trade integration between those countries (trade creation), to the detriment of their trade with the rest of the world (trade diversion). In short, integration generates conditions and incentives for member countries to replace external trade (with non-member countries) with trade with other member countries. This did in fact occur in the case of EU countries: Their internal integration is overwhelming, around 60% of their global trade, on average. However, this did not result in disadvantage for trade with the rest of the world, which also increased in absolute value, although not as a share of total trade. While the former effect was due to integration, the latter was due to globalization.

Globalization and integration, therefore, offer the potential to reap increasing returns in trade and other activities. Based on this finding, other critical questions come to the forefront, concerning the conditions for a positive relation between the two processes and for the sustainability of a virtuous relation producing positive spillovers for the integrated parties. These questions involve such strategic issues as selecting and establishing appropriate institutional and organizational frameworks, how to accommodate gains and losses, how to manage openness and global rights vs. national sentiments and interests and how to balance leadership or hegemony with multilateralism and equity—in short, how to set up and govern the institutional and organizational architecture for the governance and management of globalization and integration.

As may be seen from these summary notes, there are various common elements between globalization and integration. Both require certain preconditions and the necessity of coordinating other aims, such as national sovereignty and national interest, with the globalization and integration processes. Yet, together with commonalities and complementarities, there are also incompatibilities and impossibilities. The different versions of the globalization trilemma shed light on the complexity of these processes.[6]

In this Special Issue, we purposefully choose to concentrate on the main actors—countries and firms—and their initiatives, leaving the grand institutional foundations of globalization and integration—the international institutions part of the United Nations system or of regional aggregations—in the background. One important result of this Special Issue is that initiatives are successful and stable when gainers are more numerous and stronger than losers. This depends on which countries and actors are better able to lead and adapt to the new global context, which initiatives are more successful and which spillovers and feedbacks they promote. The complexity of globalization and integration arises from

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their difference compared to competitive economic activities, in which case losers exit (Hirshman, 1970).

In globalization and integration, the fundamental players are states and large companies, both of which have a degree of sovereignty: from a monopoly on power and military force to overwhelming economic and financial control in markets. Therefore, the playing field is not levelled: If powerful countries or companies are losing or failing in the globalization race and integration advancement, at least in relative terms, these countries and companies may retaliate by assigning priority to short-term national interest or using their market power to take over (Mearsheimer, 2018). This is what is taking place in Western countries, faced with poor growth prospects and pressing competition from emerging countries. Grand reforms and institutions (such as Bretton Woods, WTO, EU) may impose some order upon international interactions. However, being typically drawn up by the winners of a major war, they may be at odds with emerging powers and do not solve political–economic imbalances. Similar observations hold for transnational projects and for microeconomic forms of globalization and integration (such as in the case of international specialization and GVCs), when one party is advantaged over and against another. These initiatives may promote globalization and integration, but, if they are at odds with the interests of countries and powerful firms, retrenchment of the loser may follow (Autor et al., 2016).

5. The Special Issue and the Main Themes of Globalization and Integration

This Special Issue identifies various salient aspects of the relation between globalization and integration and the forces that can promote disintegration, and contributes to highlighting various general and more particular issues using different theoretical approaches, encompassing both qualitative and quantitative analysis. The first group of articles deals with fundamental dilemmas of and alternatives to globalization and integration. They are concerned with the features of institutions, technology and comparative advantage, as well as geopolitical issues. A second group of articles investigates the complex interaction between integration and globalization, which can produce both positive and negative outcomes, such as corruption and volatility. A third group of articles focuses upon the consequences for globalization and integration of producing winner and losers and the profound transformation of sectors and institutional structures that cause heterogeneous reactions by states, including nationalism and defiance. A fourth group of papers investigates varieties of the globalization–integration relation, with particular reference to the difference between global and regional integration and the emergence of new challenges in terms of market integration (e.g., labour and financial markets), FDI, customs risk management and new global players. The final group of articles analyzes two political approaches that are becoming widespread and that impede the process of globalization, namely, protectionist policies and sanctions.

5.1. Dilemmas and Alternatives to Globalization and Integration

The first task is to assess whether and how globalization and integration may fit together and mutually strengthen one another or whether the answers to these questions depend on particular conditions and circumstances. The Special Issue addresses these questions by looking at four critically important issues. The first issue is the change in revealed comparative advantage for emerging markets in the last half-century, which introduces the economic rationale for the effects of globalization and integration. Second, there is a complex trade-off between the advantages of economic integration and the significant vulnerabilities related to resilience and security. Third, the importance, strengths

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and limitations of competitive global infrastructure initiatives are analyzed in a comparative perspective by examining their geopolitical and qualitative implications. Fourth, the interaction between globalization and integration is examined in the complex case study of Central European countries as members of the European Union (EU), the end result of their systemic change after 1989.

The article by Andrea Boltho on Changes in Revealed Comparative Advantage in Machinery and Equipment: Evidence for Emerging Markets introduces the question of the economic rationale in the globalization and integration processes. The author focuses on the question of why some economies were successful in promoting high-tech sectors. To answer this fundamental question, he takes machinery and equipment as a rough proxy for high-tech goods, and computes Balassa's index of revealed comparative advantage for a number of emerging areas (East Asia, South-East Asia, South Asia, Eastern Europe, Latin America, Africa, and the Middle East) and for selected countries. The time span covers the years from the early 1970s to the early 2020s. The findings show the significant differences existing among areas and countries, which the article explains by way of differences in policies and the role of markets. In particular, the role of interventionist trade or industrial policies was crucial in fostering comparative advantage in some countries, whereas, in other countries, success was attained through the unhampered operation of market forces, including FDIs.

Paul Dragos Aligica and Robert Gabriel Ciobanu explore the complex trade-offs involved in global economic integration and consider integration dilemmas and alternatives in their essay on The Global Integration Dilemma: Functionalist Efficient Stability Versus Geoeconomic Vulnerability Risks. They emphasise that economic integration promotes efficiency, trade and cooperation through numerous mechanisms, such as customs unions. However, integration also introduces significant vulnerabilities, particularly when geoeconomic considerations prevail over pure economic goals, and interdependence is used as an economic weapon against partners. Based on the need to consider both sides of integration, the article illustrates how functionalist economic stability and efficiency are essential, but must be balanced with considerations of resilience and security. The article examines important case studies—the COVID-19 pandemic and Europe's reliance on Russian gas—to highlight the risks of overdependence in interconnected global systems and advocates for a mixed framework that integrates both efficiency and stability in order to balance economic benefits with the geopolitical risks of interdependence.

The comparison of different large global infrastructure initiatives is the topic of the review article authored by Euston Quah, Tan Jun Rui and Iuldashov Nursultan on A Comparative analysis of the Belt and Road Initiative with other global and regional infrastructure initiatives: prospects and challenges. Global infrastructure initiatives are fundamental for globalization and integration, yet it is important to assess the strengths and limitations of different initiatives. The first global infrastructure Chinese initiative is the Belt and Road Initiative (BRI), which is also the most important, owing to its substantial investment and expansive connectivity. BRI was followed later by other initiatives aiming to counterbalance BRI's influence, while potentially complementing regional infrastructure plans. These initiatives advocate for higher quality standards, transparency and sustainable relationships with member states, yet significant challenges persist regarding their ability to deliver superior net present value for developing economies. To clarify the strengths and limitations of the different initiatives, the article compares BRI to each alternative initiative, using insights from the literature and exploring how the value of quality soft infrastructure investments and norm absorption may be assessed through stated preference techniques.

László Csaba's perspective on Globalization and European Integration: A Central European Perspective explains why and how Central Europe will decide the future of

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the EU, and the ways it can cope with globalization. Central European countries began their transition to democracy and a capitalist market system at the end of the 1980s, and they became member countries of the EU in 2004. In their case, the relation between globalization and integration in the EU was mediated by the change in their political and economic system. The transformation of Central Europe from a group of former socialist countries into democratic market economies and members of the EU is generally considered to be a success, in terms of the convergence of their economies and their polities to the EU standards, thus stabilizing the EU's previously restive neighbourhood. However, sustaining this success is not automatic, as the ongoing challenges in terms of de-globalization risks and growing illiberalism bear witness. Moreover, the EU's declining competitiveness, and perhaps also attractiveness, requires major reforms and restructuring, both of the EU and its member states. The article aims at assessing how EU membership could also promote the globalization of its Central European member countries, in spite of the ongoing difficulties. The conclusion is that more focus on Ordnungspolitik (single market, competition policy and capital market union) is required, balanced by a lesser emphasis on the traditional institutions of re-distribution (the common agricultural policy and structural funds).

5.2. The Complex Interaction of Integration and Globalization

With the achievements of globalization and integration, interactions in the economy and among countries become stronger and more effective in influencing outcomes. Their effect is often positive for countries and market participants, but in various cases, the effect may be negative and even destabilizing, leading to instability and losses. A group of articles analyzes three important aspects of this complex interaction. First is the adaptation to globalization and integration, their outcomes and distortions, particularly with respect to corruption. The second looks at the interaction between market volatility, economic growth and cognitive biases. The third is the consequences for particular markets, prices and growth in an emerging country.

Roberto Iorio and Maria Luigia Segnana take a comparative approach to examine the impact of corruption on innovation in businesses. Their article on Heterogeneous Links Between Corruption and Innovation in a Global Economy demonstrates that the relationship between businesses and countries is heterogeneous. Their analysis is based on two principal research questions. The first deals with the role of corruption in helping or hindering innovative activities. The second aims at assessing the degree to which the institutional framework and business strategy influence the relationship between corruption and innovation in the case of domestic and international businesses. The quantitative analysis concentrates on Central-Eastern Europe and Central Asia and reaches two significant findings. First, institutional settings are important for the strength and the direction of the link when EU and non-EU countries are compared. Second, foreign and domestic ownership are affected differently by corruption at the firm-level: A "greasing" effect relevant for foreign firms in weak institutional environments turns useless or negative for foreign firms in settings with stronger controls over corruption.

Neha Parashar, Rahul Sharma, S. Sandhya and Apoorva Joshi investigate the interaction between market volatility, economic growth and cognitive biases in their article on Market Volatility vs. Economic Growth: The Role of Cognitive Bias. Cognitive biases have acquired considerable importance in explaining the volatile behaviour of markets in certain circumstances. Financial market volatility identifies abrupt and erratic changes in asset values and can have a marked impact on the expansion and stability of the economy. Market volatility is usually credited by conventional economic theory to have an inverse relationship with economic growth, both being critical indicators that influence economic stability and investment behaviour. This is because high volatility can discourage

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investments and erode trust. However, the actual behaviour of markets also depends on the cognitive biases of market actors—including herd mentality, overconfidence and loss aversion—and this renders the interaction more complex. Under the influence of cognitive biases, market actors may misread economic indicators, thereby making poor decisions and increasing market volatility, thus causing investors to behave erratically and irrationally, to the detriment of market efficiency and outcomes. The article investigates econometrically the interaction in the US, the UK and India over the period from April 2006 to March 2024, including the time of the international financial crisis. The authors find evidence of the predictive nature of market fluctuations on economic performance and highlight the substantial effect of cognitive biases on market volatility.

The third article, by Loc Dong Truong, H. Swint Friday and Nhien Tuyet Doan, further strengthens the findings of the article by Parashar et al. in a more particular relation and in an emerging country. The article topic concerns The Asymmetric Effects of Oil Price Volatility on Stock Returns: Evidence from Ho Chi Minh Stock Exchange in Vietnam over the period from 6 February 2012 to 31 December 2023. The authors analyze econometrically the relation between oil price volatility and market returns in both the short term and the long term. In the short term, they find that oil price volatility has negative, strengthened asymmetric effects on market returns. In the long term, the negative and positive changes in oil price volatility have significantly negative effects on market returns.

5.3. The Positive and Negative Sides of Globalization and Integration

We clarified above that globalization and integration are stable and evolve positively only if participating entities (countries and companies) receive advantages and gains that are at least as significant as, or preferably higher than, the disadvantages and losses they sustain. Only in this case are countries, firms and their constituents (citizens and workers, but also public budgets, country competitiveness and many others) able to avoid distress and may enjoy the advantages of cooperation, both directly and through policy processes of reform and the equalization of spillovers. As a rule, this does not hold, and different countries receive significant advantages or suffer crucial disadvantages and costs that may be permanent. This asymmetry of outcomes contributes to explaining the economic, political and social fragility of globalization and integration and the forces that foster disintegration and the formation of a multipolar world.

Four articles in this Special Issue clarify different aspects and components of these critical consequences that put the sustainability and success of globalization and integration at risk in the long run. The issue largely consists in the question of winners and losers and the lack of significant mechanisms for the equalization of spillovers in the interaction between globalization and integration. This issue concerns both countries and market actors. It is therefore vital to explain why certain countries or regions gain while others lose in the globalization and integration game. Important examples concern technological innovation, the flow of investments, the gain or loss of human capital, the development of critical infrastructure, the diffusion and role of entrepreneurship, the effect of incentives and disincentives, the level and effect of inequalities and social mobility, the definition and implementation of strategies and long-term effects, the role of governments, the existence of effective and efficient bureaucracies, the role and forms of state help and many others.

The four articles take different approaches and analyze issues at different levels of aggregation, but all provide valuable contributions to better understand and assess an intricate and often unclear set of questions. The first issue considered here analyzes the core of the relation between globalization and income inequalities as a potential danger to the very survival of globalization. The second issue concerns the development perspective of a disadvantaged continent in a globalized and integrated world. The third issue refers to

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a sector that flourished with globalization and became a significant source of inequality. The fourth issue examines an important new global actor that, in principle, should propel globalization and integration, but, it transpires, turns out to be problematic.

The article by Vladimir Popov, Is Globalization Coming to an End due to Rise in Income Inequality?, examines the relation between increasing inequalities caused by globalization and the recent rise of nationalism as a powerful element acting against globalization. The rise in inequalities refers to countries, groups of people and individuals, each of which may react by recurring to nationalistic policies, activities and demands. The article measures the rise of nationalism in many countries in recent decades, paying particular attention to the decline in the "pride in your own country" indicator from the World Values Survey. The author relates the indicator to the growth rates of per capita income and the change in income inequality (Gini coefficient) within the country. The outcome is statistically significant and shows that, when globalization lacks proper governance and is accompanied by a decline in real incomes for large groups of people, nationalist political forces may be successful in instigating anti-globalization and isolationist sentiments. In this perspective, the rise in income inequalities in major countries since the 1980s poses a threat, not only to their domestic social stability, but also to globalization.

The essay by Greg Mills and Richard Morrow looks at the situation and development perspectives of Africa in the frame of globalization. Their article, The Donkey and the Thorn Tree: Reappraising Globalisation and Africa, aims to explain why Africa failed to take advantage of the opportunities offered by globalization. One explanation considers the vulnerability of the continent due to unfavourable conditions in a kind of path-dependent explanation based on decades of weak economic performance: a burgeoning youthful population, insufficient infrastructure, benign donor neglect and more malign foreign interference. Yet, according to the authors, less economically developed countries from similar domestic environments in Asia, Europe and Latin America have successfully and rapidly developed. This observation suggests that lack of development in various African countries may be due to wrong development paths. The problem, in the authors' vision, is that Africa failed to take advantage of the opportunities of globalization in the form of open competition for business and markets, which leads to their conclusion that politics, not economics, is the principal development impediment. They demonstrate the strength of their conclusion by comparing Somaliland with Singapore, and conclude with an appeal for democratic politics as a fundamental precondition for development.

The article by Wladimir Andreff uncovers a significant source of inequality in professional sport, a sector that boomed largely through globalization. In his article on the Globalisation of Professional Sport Finance, Andreff analyses the model of finance, ownership, and several novel trends in global sport finance to explain the financial dimension of the global economic system of professional sport. The radical transformation of professional sport, particularly in European football and then spreading throughout other professional sport disciplines, took place during the 1990s. In that period, European football switched from gate receipts to TV rights revenues and from local/domestic to internationalized sources of revenue. The article evidences in detail how the whole distribution of sport financing was restructured. Starting from this first stage of finance globalization, sport finance underwent further transformations. Football moved from the globalization of flows (financing and revenues) to asset globalization (club ownership), up to the emergence of treating professional players as financial assets and crypto-assets penetrating the sport business.

In recent decades, sovereign wealth funds (SWFs) assumed a crucial role in globalization and integration. In principle, and considering the quantity of managed resources and the global business perspective, this new global actor should enhance the international

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movement of capital and facilitate economic development in domestic and host countries. However, as David M. Kemme stresses in his review article on The Sovereign Wealth Fund Paradox: Evolution, Challenges, and Unresolved Issues, the role of sovereign wealth funds turns out to have a problematic dimension. This dubious aspect arises from SWFs' lack of transparency and accountability. Moreover, state ownership gives rise to suspicions and realizations, among others, of political motivations, unfair commercial advantages and opportunities for corruption and national security threats. Although most SWFs have a beneficial role, the SWF landscape and individual SWFs' features, goals and behaviours are somewhat varied, and conclusions should be balanced so as to avoid easy generalizations. Moreover, SWF-related policies and enforcement mechanisms are host country-specific and highly variable, and a shared international regulatory framework has not yet emerged. The author provides a wealth of qualitative and quantitative information regarding SWFs and related policies, and identifies major concerns and policy options associated with them. It is concluded that SWFs in market-oriented democracies are more transparent and therefore less problematic.

5.4. Varieties of the Globalization–Integration Relation

Globalization and integration are complementary concepts, yet important distinctions and potential contrasts may exist between them, as elucidated above. Globalization may be defined in simple terms as the increasing interdependence among economies, markets, countries, people, technologies, knowledge, information and cultures (Scholte, 2008). Globalization is made possible by the foundation of relevant international institutions defining the rules overseeing interdependence and enforcing the protection of interdependent initiatives, relevant rights (such as copyrights) and assets (such as investments abroad), and by the reduction in barriers to interdependence, such as international trade, the liberalization of people and capital movements, the development and falling costs of transportation and the advancement of information and communication technologies. Historically, globalization also relied on prolonged periods of peace and the existence of an international order that guaranteed trade and the movement of people. Prominent cases are the East–West globalization in the Middle Ages when China and the established power of the Mongol empire guaranteed exchanges along the Silk Road. The globalization preceding WWI was based on the strength of the British empire and the prevailing globalization in the US hegemony. Yet, at the same time, globalization requires international order and guarantees to merchants, people and international investors. Fundamental factors for the economic convenience of globalization are improvements in the technology of transportation and communication reducing transportation and communication costs; people's propensity to take advantage of the opportunities provided by increasing economic integration; and supportive public policies (Mussa, 2000).

Four papers in this Special Issue consider both forms of integration and treat them at both the macroeconomic and microeconomic level. In the real world, the pressing question of whether globalized and integrated markets are always better must deal with the distortions and obstacles to the existence of a truly playing field. Therefore, the adaptation of markets to a globalized and integrated world may be at odds with supranational cooperation when societies and markets are distorted. A prime example would be the features of the relation between migration and financial markets. This is the subject of the article by Juan David González-Ruiz, Camila Múnera-Sierra and Nini Johana Marín-Rodríguez on the Perspectives on Migration and Financial Markets Research. The article analyses the economic features and effects of the trans-border movement of people on financial markets by means of scientometric and bibliometric instruments. The authors' findings underscore the existence of noteworthy obstacles to the smooth and effective working of these markets.

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The significant international flow of remittances by migrants and the role of microfinance play a significant role in financial markets. In spite of the importance of financial resources that migrants move, however, the scant integration of migrants in formal banking systems negatively impacts financial markets and their dynamics, with evident policy implications.

The flow of significant amounts of FDIs among countries is one of the salient features of globalization and the integration of economies. Sheng-Ping Yang, in his article on The Determinants and Growth Effects of Foreign Direct Investment: A Comparative Study, concentrates on the factors that determine inward foreign direct investments. In particular, the author takes an econometric approach to look at the effect of FDIs on productivity and their contribution to economic growth. Based on the analysis of 34 OECD and 50 non-OECD countries from 2010 to 2019, he finds that FDIs positively influence productivity in both OECD and non-OECD countries, particularly when the flow interacts with important features of the recipient economy, especially economic freedom and robust economic infrastructure and development levels. This conclusion also highlights important differences between OECD and non-OECD countries. Economic freedom attracts FDIs above all in OECD countries, but, in itself, it does not contribute significantly to growth; conversely, economic freedom significantly fosters economic growth in non-OECD countries. The effect of robust economic infrastructure and development levels is more univocally positive and more important in both groups of countries. These finding have significant consequences for policies. In particular, the promotion of economic freedom is effective in fostering productivity gains from FDIs.

An interesting case of looking at globalization and integration from the "reverse" side is presented in the review article by Sandra Karklina-Admine, Aldis Cevers, Arturs Kovalenko and Armands Auzins on the Challenges for Customs Risk Management Today: A Literature Review. The aim of the authors is to focus on customs risk management by means of a thorough review of the scientific literature over the period of 2005–2024 and complementing it with a qualitative content analysis and synthesis. When countries are involved in and must adapt to globalization and integration, their customs services must continuously improve their organization, professional quality and operational methods, and streamline these to the prevailing practices worldwide in a well structured, integrated and systematic way to manage customs risks. With globalization, integration and technological development, the customs operating environment changed significantly, the speed of transaction accelerated and uncertainty increased markedly, due to the growth of trade and travel volumes and the significant change in the role of customs and its methods of control. These events create additional fiscal, security, financial, and safety risks, affecting the resources available to customs services and influencing how customs administrations manage and approach their tasks. The current depreciation of the geopolitical situation added significant risks and complexity to the role and work of customs. The article concentrates on the challenges of customs risk management and the effectiveness of their work and advances considerations for improvements.

The fourth article in this section is authored by Panagiotis E. Petrakis, Anna-Maria Kanzola and Ioannis Lomis. Their article on Adapting to Multipolarity: Insights from Iterated Game Theory Simulations—A Preliminary Study on Hypothetical Optimal Global Cooperation begins from the observation that the global geopolitical landscape shifted toward multipolarity following the rise of new powers. This structural change and the complexities of multipolarity require new strategic frameworks and international institutions for promoting global stability and cooperation. They use an iterated prisoner's dilemma approach extended to a multiplayer setting to examine the impact of multipolarity on international cooperation in search for a hypothetical optimal global cooperation. Their study confirms that the increase in the number of large countries leads to higher

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levels of cooperation. Moreover, multipolarity may foster new forms and processes of economic development based on fair international competition, provided that cultural and value systems support cooperation. This outcome also requires that strategies and cooperative dynamics evolve appropriately in a way that supports international economic policy integration and sustainability, and manages vulnerabilities in the relations between great powers.

5.5. The Forces Disrupting Globalization

This Special Issue includes two articles dealing with two particularly important challenges to globalization and integration: the increasing use of sanctions and the threat of protectionism. The former is the topic of the article by Steven Rosefielde on Impairing Globalization: The Russo-Ukrainian War, Western Economic Sanctions and Asset Seizures. Rosefielde's case studies concern the nature and effects of the succeeding waves of sanctions that Western countries imposed on Russia following its invasion of Ukraine in 2022. He offers a valuable interpretation of the effect of sanctions based on demand and supply adjustment possibilities. The case of universal non-substitution, which maximizes sanctions' adverse impact on GDP, holds when import, export, production, distribution and finance are inflexible. The article elaborates on these conditions and, by using predictions by international organizations on the expected GDP losses for Russia, draws inferences about the efficiency of Russia's workably competitive markets. The findings show that the Russian economic system exhibits moderate universal substitutability. It is therefore less vulnerable to sanctions than Western policy makers suppose. The relative inefficacy of sanctions against Russia will hardly push the Russian government to stop the war, in spite of the indubitable costs that Russia is sustaining. Although sanctions are compatible with Pareto-efficient free trade and globalization, the lack of focus by Western countries, due to their geostrategic goals and the intensification of the war, puts the effect of sanctions at risk. Sanctions are more effective when they are precision-targeted. Conversely, the expanded array of sanctions is degrading free trade, and spurring de-globalization and anti-Western coalitions. Given enough time, the goals of free trade and globalization could be set back for decades.

The article by Marek Dabrowski on The Risk of Protectionism: What Can Be Lost? takes a broader approach by examining a wide set of protective measures to invite the reader to reflect on what can be lost due to protectionism. There is no doubt that protectionism is on the rise, often hidden by a host of politically attractive but economically misleading slogans—from regaining control of value chains through the reindustrialization of leading Western countries to correcting "hyper-globalization". These new leading slogans create serious challenges to the global trade system and global economic development. Growing geopolitical goals and strategies, tensions and conflicts are jeopardizing trade and financial transactions. This situation may easily create irreversible damage in terms of a spiral of trade and financial wars and retaliations, through which protectionism could cause significant losses to our economies and ways of life. The article analyses the likely consequences of the dangerous reversal in four areas that have benefited from globalization and economic integration since the 1980s: economic growth, poverty reduction, decrease in global economic inequalities and disinflation. The article concludes by discussing potential remedies that may aid in preventing the protectionist drift.

6. Conclusions

The present time is one of reconsideration of the post-war global economic and political order and of disruptive actions against that order, without any perspective so far for the construction of a new global order. The most likely perspective seems to be that of a

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multipolar world in the making. The post-war order was based on the Bretton Woods agreements among the powers that were winning WWII, particularly Anglo-Saxon powers. The order was de facto a unipolar capitalist order under the undisputed hegemony of the United States. The concept of globalization gained strength precisely in this context, fueling the expectation that all world countries would tend to converge towards a model of liberal capitalism, thus transforming the world into a global village.

In due time, the Bretton Woods order came to involve the entire Western world and, after the start of the transformation in Central-Eastern Europe in 1989 and the disruption of the Soviet Union, it also came to involve the former socialist world, together with the "third world". China, after economic reforms initiated under Deng Xiaoping in 1978, is also often included in this one-world system. Although this view is increasingly disputed on a geopolitical basis, and so also on an economic basis, there is no doubt that the world economies are strongly interconnected is many ways and are mutually integrated.

This observation overlooks an important issue on the nature of the world system. The presence of a hegemonic power like the US can determine a single world order, but it does not eliminate the heterogeneity of countries, nor the emergence of winners and losers in the process of globalization. These factors are now pushing towards a multipolar world. Although it was born as a hegemonic, unipolar system, the rise of emerging powers introduced the fundamental question of whether the system continues to have a unipolar nature or, perhaps better, whether it is progressively transforming de facto—but not yet de jure—into a multipolar system. More important for this Special Issue is that the continuation of the world system rests on one hypothesis: that the world economy will continue to rely on globalization and integration. The present time, with intensifying economic, political and geostrategic challenges to globalization and integration, is dangerously challenging the very institutional and political basis of the world economy. If the drive to globalization melts down, so too will the world system inevitably enter into a critical situation. The liberal order of globalization may even disrupt, or completely change, the current conception of globalization and integration through new forms of organization and governance, including the expansion of forms of economic organization such as state capitalism or political capitalism and of political systems such as illiberalism and autocracy.

Clearly, there are many other issues that could be interesting and important to consider for meticulously explaining the features and importance of globalization and integration. This Special Issue presents various perspectives, analytical approaches and case studies that, together, offer a manageable yet broad overview of the issues at stake and a deep analysis of particular critical aspects of globalization and integration and their interaction, with the purpose, at this difficult time, that they can contribute to raising warnings and our understanding of the stakes. We have a world system that is greatly imperfect and also unpleasant in various senses, and is certainly in need of wide and deep reforms, but the alternatives with which we are apparently confronted appear much worse and considerably more dangerous by comparison. We trust that the knowledge and information that the Special Issue offers may provide a small, yet precious, contribution to readers to think carefully before contributing to moving in the direction of strengthening dangerous processes, and convince them to offer their support to the changes that have to be elaborated, agreed on and implemented to make the international economic system more viable, effective and fair.

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Notes

1 Empirical evidence seems to support the idea of a cluster-based regional convergence within the European Union, even among countries in the monetary union (Monfort et al., 2013; Cutrini, 2019; Iammarino et al., 2019; Casagrande & Dallago, 2024).

2 Wallerstein (2004) also included socialist countries in the capitalist world system led by the United States, albeit in a secondary role. He claims that there is only one "world-system" connected by a complex network of economic exchange relationships, including both socialist countries and the "third world". However, it is fair to say that their position was both subordinate and administratively and politically separated, with a significant part of economic activity also separated and in part autarchic.

[3] For example, in the case of a car, the number of components is around 30,000 to 40,000, depending on the make, model and complexity of the vehicle.

[4] The production process of an iPhone 14 offers a clear picture. Being assembled in China, the iPhone production is accounted as a Chinese export, thus contributing statistically to the U.S. trade deficit by an estimated $10 billion in 2018. However, companies in various countries actually contribute to the production: the iPhone is designed in California and assembled in factories owned by a Taiwanese company using components produced in various countries. In the end, the United States contributes 32% of the value of the iPhone's components, followed by South Korea (25%), Japan (11%) and Taiwan (7%). Chinese firms contribute only 4% of the iPhone components' value (Brooks & Vagle, 2025).

[5] This type of convergence is defined as beta-convergence. Sigma-convergence refers to the reduction in income differences across economies. Conditional convergence (Howitt & Mayer-Foulkes, 2002) refers to convergence under the condition of some equal condition among countries, such as saving rates or population growth rates.

[6] The classical impossible trinity or trilemma—based on the hypothesis of uncovered interest rate parity—was first presented by Mundell (1963) and Fleming in the early sixties. It foresees that it is impossible to have a fixed foreign exchange rate, free capital movements and an independent monetary policy simultaneously. Only two of these can be implemented at the same time (Bordo et al., 2015; Fleming, 1962; Mundell, 1963; Obstfeld et al., 2005). Later, globalization became the frame of the trilemma, of which there are different versions. According to the original formulation, "the political trilemma of the world economy" (Rodrik, 2000, 2011), globalization, the nation-state and democratic politics could not coexist and only two of them could be pursued. Of the three, national governments would initially address the distributive and governance challenges posed by globalization, giving way to the prominence of the nation state in the long run. In a recent article, Rodrik (2024) formulates a new trilemma, stressing that "it may be impossible simultaneously to combat climate change, boost the middle class in advanced economies, and reduce global poverty. Under current policy trajectories, any combination of two goals appears to come at the expense of the third."

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Changes in Revealed Comparative Advantage in Machinery and Equipment: Evidence for Emerging Markets

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Abstract: The paper computes Balassa's index of revealed comparative advantage for machinery and equipment (a rough proxy for high-tech goods) for a number of emerging areas (East Asia, South-East Asia, South Asia, Eastern Europe, Latin America, Africa, and the Middle East) and for selected individual countries over some 50 years, from the early 1970s to the early 2020s. The focus is on why some economies were successful in promoting high-tech sectors. As could be expected, experience differs hugely. In some countries, interventionist trade or industrial policies were crucial in fostering comparative advantage. In others, however, the role of policies appears to have been minor and successes were achieved thanks to the free play of market forces (including an important contribution, at least in some countries, coming from foreign direct investment).

Keywords: comparative advantage; emerging markets; growth; industrial policy

1. Introduction

Economic growth remains a goal for most countries and, indeed, most individuals. It can bring with it some undesirable effects, in particular for the environment, but the rising tide of green regulations and policies (notably in the more advanced economies) is beginning to reduce such negative externalities. Hence, policy makers still strive to achieve growth virtually everywhere. One form of growth that is particularly welcome is so-called "export-led" growth. This is seen as highly desirable for several reasons. It obviously leads to higher output per capita (assuming low population growth), but it also suggests, indirectly, that a country is competitive on the world scene, thus making further growth more likely in future; it also improves (other things equal) the external account, which, in fixed exchange rate systems, may act as constraint on the economy, and it brings in foreign currency, which, particularly in poorer countries, is a scarce resource.

What could be more welcome than a process of export-led growth centered not so much on primary products but on manufacturing and, if possible, on manufacturing in high technology sectors? This surely is a highway to lasting prosperity! But how many countries have actually achieved such a feat? The literature on export-led growth is not particularly encouraging. For the post-World War II period, a fairly general conclusion is that the many tests that have been carried out (often of the Granger-causality variety) have seldom succeeded in proving the hypothesis, at least for the advanced economies. A survey for post-war Western Europe concluded, for instance, that while "phases of export-led growth during cyclical upswing were almost certainly present . . . longer-run spells of above average growth pulled by foreign demand are . . . very difficult to detect" (Boltho 2020, p. 201). Rather than showing "export-led" growth, the evidence points to the almost opposite thesis of "growth-led" exports.

Many observers would, however, still argue that specializing in high-tech production, even if not specifically for exports, is very likely to enhance welfare and prosperity. After all, the high living standards of the United Kingdom, the United States, Germany, or Japan today are surely in part at least a consequence of their primacy in the early days of industrialization and of their gradual moves into new sectors characterized by ever more

complex production techniques (e.g., from textiles, to steel, to chemicals, to machinery, to ICT), which, in turn, led to successful exports. The literature on endogenous growth has suggested that a link exists between a country's growth and specialization in high-tech activities (Young 1991).

A way to combine the two strands (high-tech and foreign trade) is to look at one very simple synthetic indicator: the so-called index of "revealed comparative advantage" (Balassa 1965). This measures the ratio of a country's share of world exports in a particular product to its share of total world exports. Any index value above unity "reveals" that the country in question enjoys an apparent advantage in the world market for that particular product since its presence in that market is above what would normally have been expected given its weight in the world economy.[1] Balassa's revealed comparative advantage (henceforth RCA) index has been subject to criticism and alternative formulations have been suggested (see, for instance, Stellian and Danna-Buitrago 2022), but, in the words of these two authors: "Published studies do not agree on why one index is preferable to another, and the Balassa measure remains a reference in the literature" (*ibid.*, p. 46).

Hence, the paper sticks to Balassa's original RCA index formulation. Such an index can be easily computed given the availability of foreign trade data over prolonged periods of time. For an earlier work following a similar approach, see Balassa and Noland (1989). The paper's main aim is to look at how a large number of emerging markets performed over half a century in changing the composition of their foreign trade and on what were the main reasons for why some were successful. The next section discusses the approach followed. Section 2 looks at the main results while Section 3 provides some tentative explanations. The very brief Conclusions (predictably) conclude.

2. Approach

What could proxy "high-tech"? The choice of sectors in this area is vast and rapidly changing over time with very few uniform guidelines. One possible short-cut would be to use data on R&D expenditure as a percent of, for instance, an industry's total sales (and/or the numbers of scientists and engineers as a share of an industry's total employment) (cfr. Balassa 1977). Such data, however, are not easily forthcoming for many countries and for longer periods of time. A simplification, no doubt, would be to look at foreign trade and use category 7 of the standard international trade classification (SITC) which encompasses "Machinery and transport equipment". This is probably a proxy not so much for high-tech but for both medium- and high-tech activity, since not everything that is included in SITC 7 is of high technological sophistication (airplanes and electronic machinery are, the assembly of passenger cars, less so). The category also ignores advanced chemical and pharmaceutical products. It still, however, almost certainly covers the bulk of medium- and high-tech production both in the past and today. Its main drawback is that it cannot distinguish between the various sources of comparative advantage (factor endowment, technology, trade policies, institutions . . .) and can be influenced by the presence of trade barriers. On the other hand, it reflects both relative costs and non-price factors.

Data were collected on total manufactured exports and on exports of SITC 7 for a large number of emerging economies.[2] The main source was the United Nations (UN) for statistics between 1970 and 2022, complemented at times by data from the World Trade Organization (WTO). There are, inevitably, some gaps in these statistics as well as breaks in series that had to be filled in with either interpolations or with other, at times more arbitrary, adjustments. Several groups of countries were covered. The emerging world was subdivided between East Asia (China and the four so-called NICs, Hong Kong, Singapore, South Korea, and Taiwan), South East Asia (Indonesia, Malaysia, the Philippines, Thailand, and Vietnam), South Asia (Bangladesh, India, and Pakistan), Eastern Europe (the Czech Republic, Hungary, Poland, Russia, Romania, and Slovakia), Latin America (Argentina, Brazil, Colombia, Chile, the Dominican Republic, Ecuador, Mexico, and Peru), Africa (Algeria, Egypt, Kenya, and Morocco) and the Middle East (Iran, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates, plus Israel and Turkey).

The revealed comparative advantage (henceforth RCA) indices were calculated using as denominators not total world and country exports, but only world and country total manufactured exports, excluding, therefore, trade in primary products. As mentioned earlier, any index value above unity suggests the presence of an RCA in SITC 7 for the country in question. Growth in such RCAs would mean that exports and the production of machinery and transport equipment were growing. This, in turn, would have been likely to spur overall growth given that total factor productivity in the machinery and equipment sector is well above average (Herrendorf and Valentinyi 2012).

3. Findings

Figure 1 illustrates developments for the seven major areas selected above.[3] Three regions show clear improvements over time in their RCA indices which, by the end of the period, are all above the value of unity: East Asia most notably throughout the 50 years under examination, South-East Asia also virtually through the whole period, and Eastern Europe from the mid-1990s, following the sharp falls incurred during the early years of transition from communism to democracy.[4] None of this comes as a big surprise. The East and South-East Asian economies have long been highly competitive on the world market for manufactures. Eastern Europe has also been successful since the fall of the Berlin Wall, helped by low labor costs and rapid integration into Western Europe.

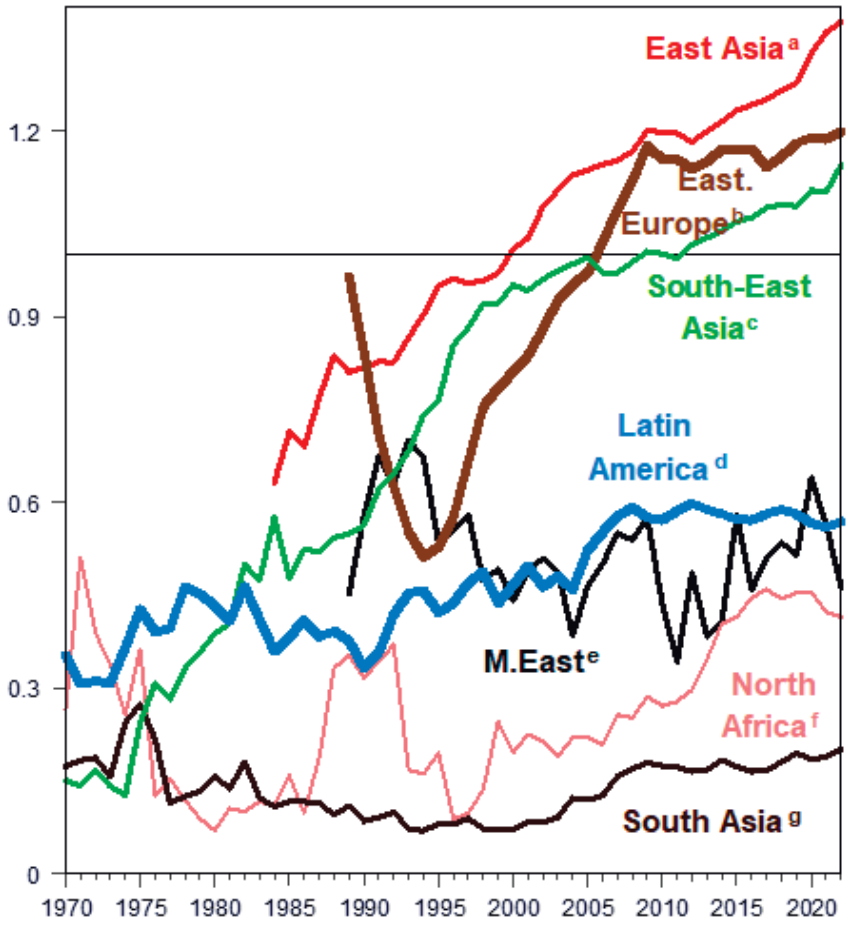


Figure 1. Emerging Markets-Revealed Comparative Advantage—Machinery and Transport Equipment (SITC 7). a. China, Hong Kong, Korea, Singapore, Taiwan; b. Czech Rep., Hungary, Poland, Romania, Slovakia; c. Indonesia, Malaysia, Philippines, Thailand, Vietnam; d. Argentina, Brazil, Chile, Colombia, Dominican Rep., Ecuador, Mexico, Peru; e. Kuwait, Oman, Qatar, Saudi Arabia, UAE; f. Algeria, Egypt, Morocco; g. Bangladesh, India, Pakistan. *Sources*: UN, *Commodity Trade Database*; WTO, *Statistics on Merchandise Trade*.

The picture for the other emerging areas here considered is more mixed. None have RCAs above unity, and few show strong long-run improving trends. There are sharp year-to-year fluctuations almost everywhere (which may, at times, reflect problems with the underlying statistics), but little evidence of a gradual upgrading in the export performance of what many would consider crucial sectors for longer-run economic growth.

Turning to individual countries, trend growth rates were computed for each one of them by regressing the RCA indices on time. Strongly positive trends were found in 16 cases (Table 1). Noteworthy in particular, are the performances of the city-state of Hong Kong (in East Asia), of the Philippines (in South-East Asia), and of Mexico (in Latin America). The latter may not come as a surprise given the country's strong and growing ties with the United States. The former two, on the other hand, may strike some observers as unexpected. Results for the other 23 countries are shown in Appendix A Table A1. Among the major countries, Argentina, India, and Indonesia manage some modest trend improvements, Brazil, Egypt, and Russia do not. Some economies show statistically significant negative trends (Algeria, Bangladesh, Oman, Pakistan, and Saudi Arabia).

Table 1. Time trends in revealed comparative advantage SITC 7—machinery and transport equipment.

	Time Period	Coefficient	t-Ratio *
Vietnam	1997–2022	0.038	14.5
Philippines	1970–2022	0.036	20.0
Slovakia	1993–2022	0.033	16.1
Romania	1989–2022	0.026	7.9
Hong Kong	1970–2022	0.025	25.8
China	1980–2022	0.024	19.2
Thailand	1970–2022	0.024	22.3
Czech Republic	1993–2022	0.022	13.3
Korea	1970–2022	0.021	21.0
Mexico	1970–2022	0.020	16.3
Morocco	1970–2022	0.019	14.4
Taiwan	1970–2022	0.017	27.6
Hungary	1993–2022	0.016	8.1
Turkey	1970–2022	0.015	20.8
Malaysia	1970–2022	0.015	5.6
Poland	1993–2022	0.014	6.9

* A value that indicates whether the coefficient on time in the regression is statistically significant; usually a value above 2 suggests that it is. *Sources*: Author's computations on data from: United Nations, *UN Comtrade Database* and World Trade Organization, *Statistics on Merchandise Trade*.

4. Explanations

This section focuses primarily on the success stories shown in Table 1 and illustrated by Figures A1–A4 in Appendix A. What can throw light on the reasons for these positive performances? Were they primarily the result of market forces or of public sector intervention?[5] Was it entrepreneurs, little hindered by intrusive governments or excessive regulation, who spotted opportunities at home and abroad in relatively capital-intensive or advanced technological activities, invested on a large scale and reaped the ensuing profits? Or was performance helped by large inflows of foreign direct investment (FDI) exploiting the benefits of low wages? Alternatively, was it instead governments who, in economies with relatively abundant labor and underdeveloped financial systems, felt that growth in capital-intensive activities, requiring large financial outlets, had to be encouraged

by some forms of active intervention to overcome private inertia? These are, of course, much-debated issues, which are far from having been fully solved.

One possible line of enquiry would be to look at the World Bank's ease of doing business indicators and seeing whether relatively deregulated economies did better than more interventionist ones. Correlating the trend growth rates of the RCAs for the 39 emerging economies here looked at with either the ease of business prevalent in 2019[6] or changes in that ease between 2009 (the first year for which data are available) and 2019 results in marginally statistically positive coefficients suggesting, *prima facie*, that deregulation may have had some positive effects on export performance in machinery and transport equipment. Adding inflows of FDI in percent of GDP over the whole period marginally improves the outcome, but the results are very tentative, and the time spans covered differ greatly (1970–2022 for the RCAs and FDI for most countries, but only 2009–19 for ease of business).[7] Hence, a more ad-hoc approach, which briefly looks at selected countries and episodes, will be followed.

Taking intervention first, it would seem that one form that may have been successful in the past (protectionism) can be ruled out for the trends shown here. Evidence for Britain in the 18th century and for a number of advanced countries in the 19th century suggests that industrial growth was almost certainly helped by tariffs or even full bans on imports (e.g., O'Brien et al. 1991; O'Rourke 2000; Clemens and Williamson 2004) and protectionism may well have helped some crucial industries to grow very rapidly in the Japan of the 1950s and 1960 (Boltho 1978). Such views are nowadays condemned by mainstream analysts, but, as was aptly said: "... the current focus on the postwar relative superiority of outward-oriented policies is empirically myopic, ignoring the fact that historically many capitalist economies, such as the United States and Japan, experience rapid growth under early conditions of protectionism" (Young 1991, pp. 369–70).

It is true that import substitution, a policy followed by many countries both in the distant past but also in more recent decades, gets a bad press. Two dangers, in particular, lurk behind the protectionism it usually entails: inefficiency and rent seeking. The absence of foreign competition can send domestic firms to sleep unless fierce domestic competition (as was the case in Japan) pushes companies to invest and improve productivity. The appeal of the higher profits, which a protected home market is likely to provide, encourages firms to lobby politicians and civil servants so as to obtain the desired trade barriers, thereby wasting resources and, possibly, encouraging corruption. The dangers are particularly present in relatively small economies with few firms in each sector and in countries with inefficient or corrupt administrators. Many developing countries, unfortunately, meet both criteria.

Be this as it may, over the last few decades, the world has embarked on a sustained campaign of foreign trade liberalization. World Bank estimates show, for instance, that for both high-income and low- and middle-income economies, the average weighted tariff rate had declined from some 5 and 25 percent, respectively, in the late 1980s to some 2 and 5 percent in 2017. Quantitative controls followed similar trends. Recent years have seen some movement in the opposite direction (largely, but not solely, thanks to Trump) and non-tariff barriers seem to have risen lately in a number of both advanced and developing economies (Kinzius et al. 2019), but trade today is nonetheless a lot freer than it was 50 years ago.

Other forms of intervention in more recent times have, however, not been absent. The most publicized has been industrial policy, a vague term involving a whole array of instruments designed to help particular sectors or firms, going from direct subsidies to favorable tax treatment, to easy access to credit, etc. Much of the modern literature on such schemes is critical or, indeed, scathing. It is entrepreneurs working in open markets, not bureaucrats working behind their desks, who generate successful products and hence exports. Yet, the economic history of several of the countries here looked at may suggest otherwise.

East Asia. Looking at the most successful area, East Asia (Figure A1), there can be little doubt that China's rising RCA resulted primarily from massive government intervention in machinery and other similar production. China's private sector is both dynamic and highly competitive, but heavier and high-tech industries were primarily in the hands of the government, which lavished favors on them. There was no such central planning elsewhere in East Asia but recent research suggests that industrial policies were important (Juhász et al. 2023). Thus, evidence from South Korea (henceforth Korea) suggests that the state played a crucial role in the country's industrialization, be this in steel (Redding 1999), in shipping (Lee 1990), and more generally in the economy (Amsden 1989; Lane 2022). Taiwan may seem a less obvious candidate, yet here too the government aided manufacturing companies through a variety of instruments (Rodrik 1995; Wade 2004), and, in particular, the production of semi-conductors via significant injections of capital in 1987 into TSMC, now the world's dominant firm in this sector (National Research Council 2003).[8] Three common features characterize the experience of these two countries: direct intervention to correct perceived market failures, stress on exports rather than on import-substitution, and a firm belief in the need for fierce competition for domestic firms both at home and on the world market (Cherif and Hasanov 2019). FDI, on the other hand, does not seem to have played much of a role. Both Korea and Taiwan recorded very small inflows, smaller than those of most of the countries here considered.

Hong Kong, however, provides a very different story. As was aptly said, Hong Kong's industrial policy can be described as "maximum support but minimal intervention" (Chen and Ng 2001, p. 225), the maximum support being a policy of almost unfettered "laissez-faire". Partly perhaps as a consequence, Hong Kong experienced massive de-industrialization. The share of manufacturing value added in GDP, which fluctuated between 20 and 30 percent in Korea and Taiwan between 1970 and 2020, went from 29 to 1 percent over the same time-period in Hong Kong. Yet, the territory's RCA in SITC 7 rose from 0.3 in 1970 to 1.6 in 2022, the second highest level in the sample of countries here covered. It is electronics production which spearheaded this development, thanks initially to very large Japanese and US foreign direct investment in assembly operations and exports (Tsui-Auch 1998). Today, electric and electronic items account for 95 percent of Hong Kong's SITC 7 exports. The technological upgrading that must have occurred seems to have owed little to targeted government efforts and much to the FDI of foreign corporations.

South-East Asia. How about the other South-East Asian success stories of Malaysia in the 1970s, of Thailand and the Philippines in the 1980s and 1990s, and of Vietnam more recently (Figure A2)? Malaysia and Thailand have on the whole had very different experiences, as exemplified by the growth of their car industry. In Malaysia, this was state led, with heavy government intervention in promoting national champions (the firm Proton being the most obvious example). In Thailand, by contrast, it was primarily led by the private sector, with little state interference, and an important contribution coming from Japanese investment (Abdulsomad 1999). In the Philippines, protectionism and import substitution were followed from the 1950 to the 1970s (with poor results), but from the 1980s onwards, the country embarked onto a phase of unilateral trade liberalization (Llanto and Ortiz 2015), including the freeing of restrictions on FDI. Crucial seems to have been the creation of a large number of Special Economic Zones, begun already in the 1970s. It is these that probably contributed to the very sharp rise in the country's RCA for SITC 7 at the time despite the then prevalence of inward-looking policies (Dohner and Intal 1989).

In Vietnam (for which the RCA index is only available from 1997), liberalizing reforms along Chinese lines came in the late 1980s, helped by the presence of a competent bureaucracy (Altenburg 2011), and, as in China, openness to trade and to FDI were encouraged, but the country maintained a large number of state-owned enterprises (SOEs) and was interventionist in its policies. Indeed, in the late 1990s, it even refused World Bank financial assistance, which was being offered in exchange for structural adjustments in line with the Bank's then policy (Bring 2023). The role of FDI has risen through time at the expense of

SOEs, but the economy remained in 2019 more regulated even than China's according to the World Bank's ease of doing business criterion.

The experience of these nine Asian countries is clearly mixed. Interventionist industrial policies would seem to have had clear successes in China, Korea, Taiwan, and Vietnam. Hong Kong and Thailand provide an opposite message. Here, it would seem that governments played a more passive role, limited to providing basic public goods. For Malaysia and the Philippines, the verdict is uncertain. Both dabbled with protectionism in the earlier years, when their RCAs soared, both liberalized their economies from the 1990s onwards, when their (by then high) RCAs stagnated or fell back.

Eastern Europe. The verdict is probably simpler for the five successful East European economies here selected (the Czech Republic, Hungary, Poland, Romania, and Slovakia). All five, over the shorter time-period 1993–2022, witnessed significant increases in their RCAs from about 1995 to about 2010, with Poland, however, seeing some setbacks more recently (Figure A3).

Three main features lie behind their successes. First, of course, was the abandonment of central planning and the acceptance of market forces leading to radical institutional changes. Second came openness to free trade, culminating, in 2005 (2007 for Romania), with entrance into the EU and its Single Market. Third, and not least, were inflows of FDI. Germany, in particular, sent some 15 to 20 percent of its total FDI to Eastern Europe between 1990 and 2019, creating greenfield sites and supply networks that greatly added to the recipient countries' exports. And, overall, the five countries recorded FDI inflows between 1990 and 2022 equivalent to 3 ½ percent of their GDP (unweighted average), well above the 2 percent of Western Europe over the same period. Their experience clearly shows that abandoning communism and embracing free markets can pay high dividends.

The laggard among these countries has been Poland. Its RCA was the slowest growing up to 2010 and has fallen back since. Performance was good in machinery, both electric and non-electric, but poor in transport equipment (including aircraft) and in telecommunications. There seems to be no obvious culprit for these developments. The exchange rate has not appreciated, except in 2023–24. FDI (as a percentage of GDP) has been lower than in the other four countries over the period as a whole, but the differences are not great. It has declined in the last decade, but that was also the case in the more successful Czech and Slovak economies. Nor, of course, has there been a backlash against liberalization.

Other Areas. Three more countries appear in Table 1 (and in Figure A4). The case of Mexico is probably the simplest one. Proximity to the largest single market in the world, the creation of NAFTA in 1992, and wage levels that were a fraction of those prevalent in the US, provided the country's exporters with a huge opportunity and also encouraged large inward flows of FDI. But a good deal of the country's impressive export performance since the early 1980s may have reflected Mexico's broadly successful import-substitution policies of previous decades, which had laid the basis for the country's industrialization (Ros 1994). And import substitution and selective industrial policies were still being followed in the 1980s despite the move to a more liberalized and open foreign trade regime, with apparent success in particular in the car and computer industries (*ibid.*). From the 1990s, the economy saw widespread liberalization, in part because of NAFTA's requirements (Peters 2003) but Mexico is still some way from being a fully *laissez-faire* economy.

Morocco, like many other developing countries, also moved away from a protectionist policy centered on import-substitution to gradual liberalization from 1980 onwards. The improvement in its RCA performance dates, however, from the early or mid-2000s, following the signing of an association agreement with the EU in 2000 which created a free trade area. It was mainly led by FDI in the automotive sector and in electronics linked to car production (Hahn and Auktor 2018). Targeting such specific sectors remained in place with financial incentives for FDI and the creation of special economic zones. FDI was clearly an essential input in the process (Ali and Msadfa 2019).

Turkey, not unlike Morocco, followed a protectionist policy of import substitution until about the early 1980s, years which saw little movement in its RCA. Some liberaliza-

tion was introduced from 1980 onwards, but subsidies to exporters and other forms of intervention remained widespread. This changed from 1995 as Turkey joined the WTO and established a customs union with the EU. Industrial policy moved away from sectoral targeting towards more "horizontal" measures (e.g., for regional development). Investment incentives remained in place but were less selective than earlier (Atiyas and Bakis 2015). Turkey's RCA moved upwards from the early 1990s but then stopped growing from the mid-2000s. Selective industrial policies are unlikely to have contributed to these trends (*ibid*.). From 2010, the country moved back to selective help and the targeting of medium- and high-tech sectors. Partly because of macroeconomic instability, partly because of a deterioration in the institutional environment, these policies have fallen well short of their aims, with the possible exception of the defense industry (Toksöz et al. 2023).

5. Conclusions

What is one to make of these very different experiences? As the saying goes: "there's more than one way to skin a cat". Successful mid- and high-tech industries may be fostered in a variety of ways. Two extremes stand out: Korea and Taiwan on the one hand, Hong Kong on the other. The former two show the benefits of an industrial policy that targets specific sectors but also imposes competition on them; the latter shows how the free play of market forces, combined with large inflows of FDI, can be equally successful. The latter message would also seem to apply to Eastern Europe, an area which has clearly embraced an outward-looking, free-trading approach. Most of the other countries here briefly looked at dabbled with both intervention and liberalization. China and Vietnam are interventionist but welcome FDI; Mexico has liberalized but still intervenes. The earlier successes of Malaysia, the Philippines, and Turkey owed something to industrial and import-substitution policies, but that was not the case for Thailand's relatively liberal stance in the 1980s or Morocco's more recent embrace of freer trade. These various, and admittedly vague, conclusions would merit further in-depth research.

The intellectual and also policy pendulum has been swinging in the direction of greater liberalization almost everywhere, at least until recently with, on the whole, beneficial effects. But this may no longer be the case now. The last few years have seen a significant dent in the globalizing of our economies, both developed and developing. As was put in a working document prepared by IMF staff members: "the world is facing the risk of fragmentation" (IMF 2023, p. 4). Recent years have seen a levelling off of both trade and capital flows as well as a surge of trade restrictions. The successes many emerging countries have seen on world markets, illustrated above by the rapid increases in their RCAs in advanced goods, and more generally by their closing of the income per capita gap with the rich world, owed a lot to the whittling down of protectionism and the acceptance of free capital flows, especially of the FDI variety. Political and military tensions are jeopardizing these achievements. Depending on the extent of fragmentation, costs could easily escalate, with world output being reduced by anything between 0.2 and as much as 7 percent over the longer run, with developing countries hit more than proportionately (*ibid*.). The time period covered in this paper may, in future, be seen as a "golden era" that, sadly, ushered in a less prosperous period.

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Appendix A

Table A1. Time trends in revealed comparative advantage SITC 7—machinery and transport equipment.

	Time Period	Coefficient	t-Ratio
Qatar	1989–2022	0.007	5.3
Indonesia	1970–2022	0.007	5.1
Israel	1970–2022	0.006	6.9
Argentina	1970–2022	0.006	3.6
India	1970–2022	0.005	7.3
Dominican Rep.	1974–2022	0.005	4.7
United Arab Emirates	1978–2022	0.004	1.7
Russia	1994–2022	0.003	2.0
Colombia	1970–2022	0.003	4.8
Chile	1970–2022	0.003	11.4
Brazil	1970–2022	0.002	1.4
Singapore	1970–2022	0.001	1.7
Ecuador	1970–2022	0.001	0.8
Egypt	1970–2022	0.001	1.2
Peru	1970–2022	0.001	2.5
Pakistan	1970–2022	−0.001	2.0
Bangladesh	1977–2022	−0.001	3.0
Algeria	1970–2022	−0.009	4.3
Iran	1997–2022	−0.001	0.8
Kenya	1976–2022	−0.003	1.7
Kuwait	1970–2022	−0.003	0.0
Saudi Arabia	1974–2022	−0.024	6.3
Oman	1979–2022	−0.040	14.3

Sources: Author's computations on data from: United Nations, *UN Comtrade Database* and World Trade Organization, *Statistics on Merchandise Trad*.

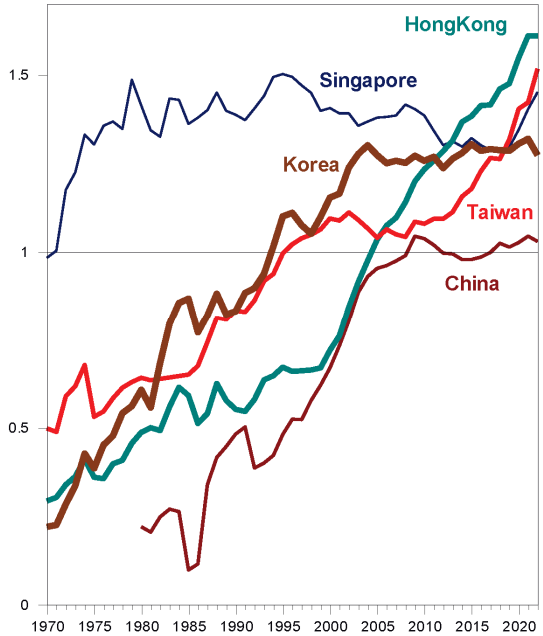


Figure A1. East Asia-Revealed Comparative Advantage—Machinery and Transport Equipment (SITC 7). *Source*: UN, *Commodity Trade Database*; WTO, *Statistics on Merchandise Trade*.

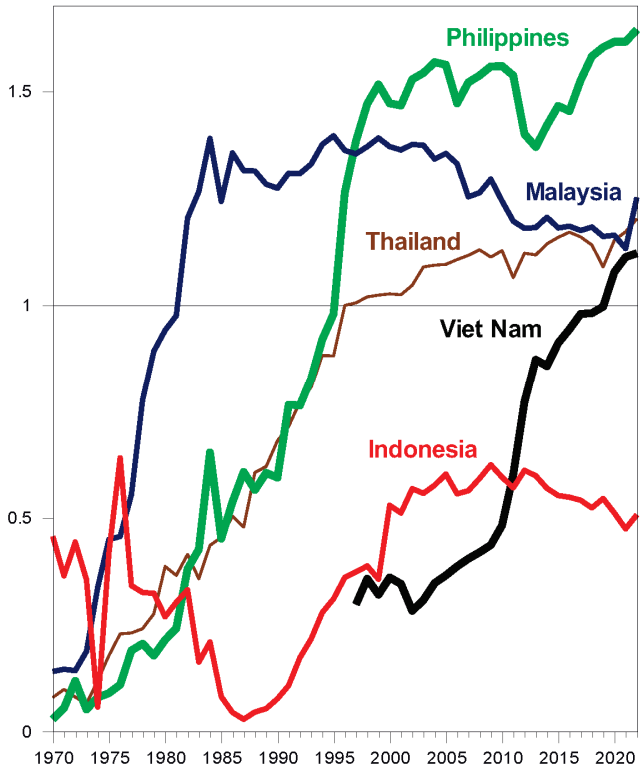


Figure A2. South-East Asia-Revealed Comparative Advantage—Machinery and Transport Equipment (SITC 7). *Source*: UN, *Commodity Trade Database*; WTO, *Statistics on Merchandise Trade*.

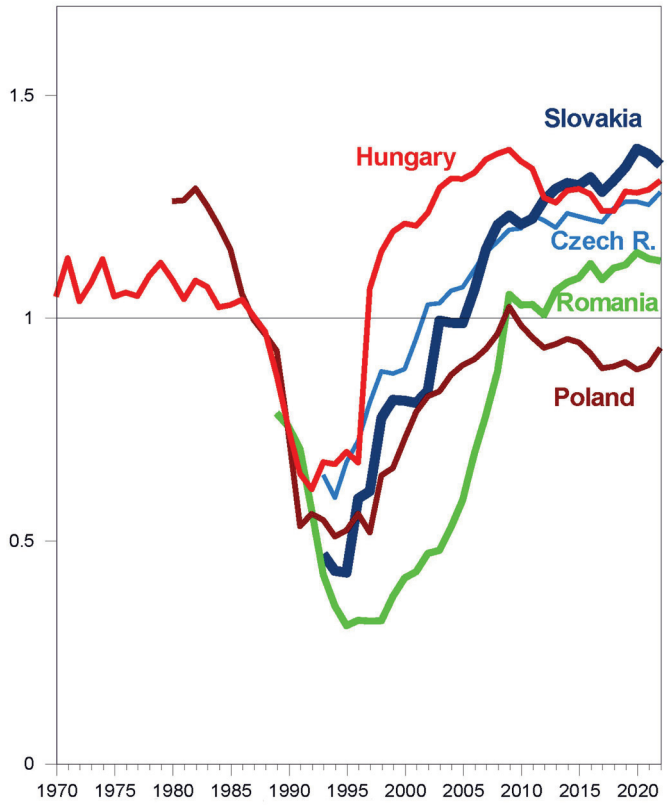


Figure A3. Eastern Europe-Revealed Comparative Advantage—Machinery and Transport Equipment (SITC 7). *Source*: UN, *Commodity Trade Database*; WTO, *Statistics on Merchandise Trade*.

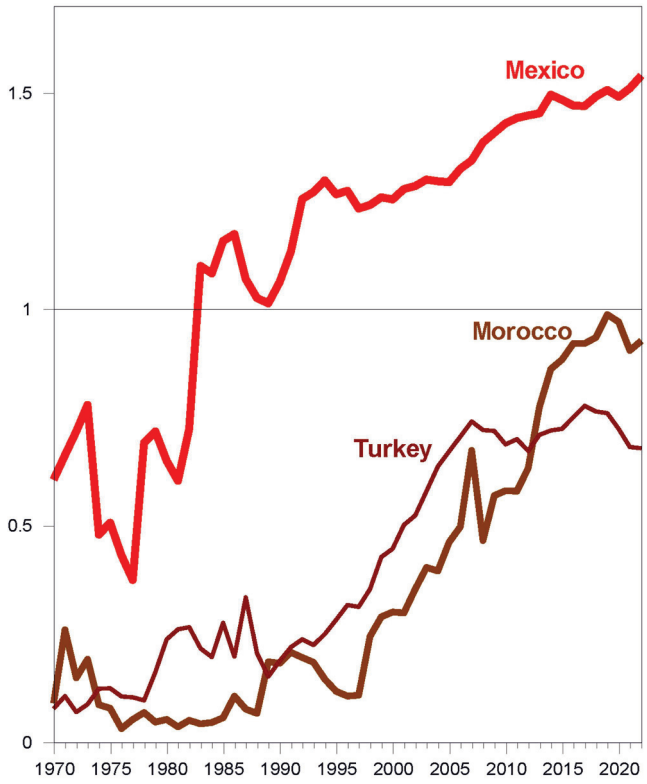


Figure A4. Others-Revealed Comparative Advantage—Machinery and Transport Equipment (SITC 7). *Source*: UN, *Commodity Trade Database*; WTO, *Statistics on Merchandise Trade*.

Notes

1 Take as an example the aircraft industry. UN data show that world exports of SITC 792 (the relevant category) were, in 2020, equal to USD 143 bn. France's exports in the same year amounted to USD 29 bn, giving it a share of just over 20 percent. France's share of world exports of manufactures in 2020 was equal to 3.15 percent. The ratio between these two shares, at 6.3, shows France enjoying a strong revealed comparative advantage in aircraft production.

2 Two (admittedly arbitrary) criteria were used in the choice of countries, designed to exclude very small economies: a GDP value in current US dollars of at least USD 100 billion in 2022; and a minimal presence of SITC exports in the starting year (usually 1970) of at least USD 1 million. A total of 39 countries were thus selected.

3 The various areas' averages are unweighted.

4 The Eastern Europe line excludes Russia, for which no data are available before 1994.

5 A third possible source of comparative advantage could be a country's institutional set-up, as argued in the "Varieties of capitalism" approach (Hall and Soskice 2001). According to these authors, modern advanced economies can be split into two major groups, coordinated market economies (such as, for instance, Germany, France, or Japan) and liberal market economies (such as the US and the UK), which, thanks to their deregulated financial and labour markets, tend to have an advantage in high-tech activities (Schneider and Paunescu 2012). This line of enquiry is, however, not pursued in what follows since there is no accepted division of the emerging markets here considered into the two categories set up by Hall and Soskice.

6 The World Bank has discontinued estimation of this indicator following suspicions that some of the 2019 data were tampered with (largely because of the alleged pressure that came from one major shareholder, China). A revised set of estimates should appear soon.

7 Limiting the RCA's trend growth and FDI inflows to the shorter 2009–2022 timespan does not improve the results.

8 Prior to that, the government-funded Industrial Technology Research Institute had built a semi-conductor plant, which it set up in 1980 as a private company (United Microelectronics Corporation, or UMC), and which is still a prominent player in the sector today.

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Essay

The Global Integration Dilemma: Functionalist Efficient Stability Versus Geoeconomic Vulnerability Risks

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Abstract: This article explores the complex trade-offs involved in global economic integration. While economic integration, through mechanisms such as customs unions, promotes efficiency, trade, and cooperation, it also introduces significant vulnerabilities, particularly in the context of geoeconomics and weaponized interdependence. Drawing on the theories of Jacob Viner and David Mitrany, this paper illustrates how functionalist economic stability and efficiency are essential but must be balanced with considerations of resilience and security. Case studies such as the COVID-19 pandemic and Europe's reliance on Russian gas during the Ukraine war highlight the risks of overdependence in interconnected global systems. Ultimately, this paper argues for a nuanced approach that balances economic benefits with the geopolitical risks of interdependence, advocating for a mixed framework that integrates both efficiency and stability.

Keywords: globalization; interdependence; trade-offs; strategic vulnerabilities; resilience

1. Introduction

The standard, traditional approach to the problem of economic integration identifies it as both an economic and a political desideratum. It is argued that economic integration provides economic benefits to the parties involved in an economic association, such as a free trade area or customs union. Moreover, economic integration has positive political externalities, such as bringing stable and lasting peace between the members of the economic association. By promoting economic integration, both economic well-being and social stability can be simultaneously achieved. Our paper takes, as a starting point, this conventional wisdom and revisits it in light of the recent lines of research on geoeconomics and "weaponized interdependence" as illuminated by a series of relevant recent case studies.

But beyond this depiction of economic integration, a more nuanced and complex social reality resides. Economic integration not only creates wealth; it also induces strategic vulnerabilities. As the emerging literature on weaponized interdependence (Farrell & Newman, 2019) argues, large-scale economic integration also creates asymmetries and structural vulnerabilities. Also, as the reemergence of geoeconomics has shown (Harris & Blackwill, 2016), states—especially the new rising powers—are prone to using economic means to achieve political goals. That includes taking advantage of the vulnerabilities created by interdependence.

Consequentially, global economic integration involves a series of trade-offs that should be carefully taken into account by both analysts and decision makers. While economic integration brings benefits—such as increased trade, investment, and cooperation—it also

introduces vulnerabilities—such as exposure to global financial shocks, geoeconomic risks, and the erosion of autonomy and control in economic policymaking. A singular focus fails to appreciate the strategic need to balance openness with policies critical for social stability, security, social cohesion, justice, and resilience.

It is our intention in this paper to revisit the problem of both the benefits and costs of economic integration. Our intention is not prescriptive but analytical. Our approach has two components: a conceptual dimension bolstered by a case study and an empirical dimension. By pointing out the complex structure of trade-offs associated with economic integration, we attempt to highlight the dilemma involved in such political and economic decisions. In the first part of our paper, we discuss two approaches to economic and political integration: Jacob Viner's assessment of the efficiency of customs unions and David Mitrany's model of functionalist integration, with the European Union case used as an illustration of a successful project of regional economic and political integration. In the second part, we explore the challenges of economic integration as they are underlined in the geoeconomics and the new "weaponized interdependence" literatures, and we use two examples to illustrate them: the shocks in the global chain supply induced by the COVID-19 pandemic and the geostrategic risks posed by Europe's reliance on Russian energy. In the last part of our paper, we revisit and extend Jacob Viner's discussion on the "Power versus plenty" framework in order to illuminate the more profound and complex structure of trade-offs involved in integration decisions. More precisely, we look at antinomic values—efficiency and resilience, peace/stability, and competition/rivalry—and show that every decision regarding encouraging, creating, or designing integration and interdependence is constrained by a trade-off of this kind.

2. The Case for Functionalist Efficient Stability

After the Second World War, economic integration was promoted as both a political and economic instrument with two main purposes. Beyond its obvious economic effects, it was envisioned as a way to bring European nations together in the aftermath of a devastating war, fostering cooperation and preventing similar conflicts in the future. As Béla Balassa argued (Balassa, 1961, p. 6), "[t]here is no doubt that—especially in the case of Europe—political objectives are of great consequence". Nevertheless, economic benefits remain the primary driver of economic integration. In the case of the European Union, however, economic and political considerations were deeply inter-related and played an equally significant role. In the following sections, we explore both the economic and political benefits of integration. To this day, Jacob Viner's analysis of customs unions and Mitrany's functionalist model serve as classical examples of the economic and political dimensions of integration. Revisiting them gives us a better sense of the basic conceptual structure behind the doctrines of functionalist efficient stability.

2.1. Jacob Viner's Theory of Customs Unions

Jacob Viner's theory offers a foundational framework for understanding economic integration through the lens of efficiency. Central to Viner's approach are the concepts of trade creation and trade diversion, introduced in his seminal work, *The Customs Union Issue* (1950). As Viner explains (2014, p. 54), "[t]he primary purpose of a customs union, and its major consequence for good or bad, is to shift sources of supply, and the shift can be either to lower or to higher-cost sources, depending on circumstances". A customs union is, therefore, a trade agreement in which member countries eliminate tariffs on each other's goods while imposing a common external tariff on imports from non-member countries. This dual dynamic of removing internal barriers and harmonizing external ones

is central to Viner's analysis of the economic efficiencies and inefficiencies that customs unions can produce.

This is the quintessential act of economic integration. While Viner's theory helps explain the efficiency aspect of economic integration, it also explains the logic of a tendency towards global economic integration as driven by the aim of efficiency. As Hosny stated (Hosny, 2013, p. 135), "Viner's study was the first to identify concrete criteria to distinguish between the possible advantages and disadvantages of economic integration". Trade creation, according to Viner, happens when a customs union causes goods to be imported from a member country instead of being produced domestically because it is cheaper to import them now that there are no tariffs. This means production is happening where it is most efficient (the member country can produce these goods at a lower cost). This shift is seen as positive, as it leads to more efficient production and lower prices.

Trade diversion, on the other hand, occurs when a customs union results in goods being imported from a member country instead of a non-member country, even though the non-member country could originally supply these goods at a lower cost (before the tariffs were removed). This happens because the tariffs on goods from outside the union make these goods more expensive than buying from within the union. This shift is not seen as positive because it moves away from the most efficient global production and can lead to higher prices. As Viner (2014, p. 55) says:

> Where the trade-creating force is predominant, one of the members at least must benefit, both may benefit, the two combined must have a net benefit, and the world at large benefits; but the outside world loses, at least in the short run, and can gain in the long run only as the result of the general diffusion of the increased prosperity of the customs union area. Where the trade-diverting effect is predominant, one at least of the member countries is bound to be injured, both may be injured, the two combined will suffer a net injury, and there will be injury to the outside world and to the world at large.

In brief, trade creation makes things more efficient and could lead to lower prices for consumers within the customs union. Trade diversion, on the other hand, is seen as a loss of efficiency because it shifts trade from where it is most cost-effective globally to more expensive sources within the customs union due to tariffs on external goods.

Although trade diversion might seem like a step away from global efficiency since it involves shifting imports from more cost-effective non-member countries to less efficient member countries due to the common external tariff, it inadvertently highlights the limitations of partial economic integration. This phenomenon can serve as a catalyst for expanding integration efforts and explains why efficient integration aims at a global scale. The inefficiencies arising from trade diversion can prompt countries to mitigate these losses by broadening the scope of their economic integration, potentially extending the customs union or forming free trade agreements with previously excluded countries. This expansion aims to recapture the efficiency lost to trade diversion by broadening the pool of countries among which tariffs are eliminated, thus moving closer to global economic integration.

The overall drive towards global economic integration, motivated by the pursuit of efficiency, reflects an understanding that the more borders can be made economically irrelevant, the more efficiently resources can be allocated on a global scale. This pursuit of efficiency, highlighted by the mechanisms of trade creation and the desire to overcome the inefficiencies introduced by trade diversion, underpins the logic of progressively expanding economic integration to encompass more countries, eventually aspiring towards a global level of integration and making the global economy more interconnected and efficient.

2.2. David Mitrany's Functionalist Model of Integration

David Mitrany's functionalism is a classical rendering of the political economy dimension of economic integration. Functionalism—developed in the context of the Second World War and its aftermath—starts from the assumption that we live in a historical moment profoundly different from the previous ages. The normative political concepts that mankind developed at the beginning of human civilization are not suitable anymore to help us navigate the challenges of our times. Human nature has not changed, but technological conditions, political institutions, and the ideological climate changed abruptly in the twentieth century. Brought together, these forces transformed—and are continually transforming—the traditional world into a new one whose shape and contours we are not clearly foreseeing now. As Mitrany (1971, p. 538) explains:

> Our present historical task is to bring the nations actively together, not to keep them peacefully apart; and so, find ways for the common government of the new critical global issues. That is precisely what the functional way tends to offer, as it cuts across existing political, ideological, geographical and racial divisions, without in the process breeding fresh distinctions and divisions of its own.

Starting from this observation, Mitrany gradually developed an approach to world organization that harmonizes (a) the idea that economic cooperation satisfies the needs of all agents who take part in exchange relationships with (b) the new political and economic reality of the administrative state. Moreover, he considers that (c) the development of modern science and technology has some externalities which can adequately be dealt with only at the international level. Hence, he proposes an alternative way of organizing the international system. First, it departs from the classical liberal solution (based on the idea that peace is a by-product of free economic relationships between private agents inside a legal framework shaped by the principles of the rule of law). Second, it departs from the realist solution (based on the idea that the balance of power politics acts as a deterrent of war). Last but not least, it departs from what, in the field of international relations, is called "the liberal solution", namely the idea that peace is the outcome of the intervention of some international organizations responsible for enforcing international law and providing certain public goods and services whenever required.

Mitrany argues that peace is the by-product of a gradual increase in human welfare. Human welfare, on the other hand, is the outcome of social and economic cooperation. But the main question still remains: how can the profound heterogeneity that defines the international system—a heterogeneity based on differences in culture, religion, moral sensibilities, historical experiences, and natural endowments—be overcome?

Mitrany rejects the idea that a political union of states, aggregated based on geographical or ideological criteria, may solve the cleavages posed by the structural heterogeneity of the international arena (Mitrany, 1943). Instead, he thinks that cooperation at different levels of the international system—local, regional, and global—can be achieved if states agree to solve practical or concrete problems together. Because an increased number of practical problems extends over the boundaries of multiple sovereign states, the response should also be trans-national. By creating an institution whose specific function is to deal with that particular problem—and only with that particular problem—states voluntarily renounce a part of their national sovereignty. The number of institutions created in this way is directly proportional to the number of practical or concrete problems that should be solved trans-nationally.

These practical problems might have a natural cause (such an epidemics, for example), or they might be produced by the technological and scientific developments (nuclear weapons, for example) or by certain social trends (massive immigration from one continent to another, for example). These institutions, whose jurisdiction and authority are shaped

by the aim for which they were created, gradually loose the sovereignty of national states and create a complex and interdependent international system. The shape, budget, and internal decision-making structures for each of these institutions should not be prescribed in advance through a formal treaty but decided according to local circumstances. Once created, according to Mitrany, these institutions or functional arrangements, as he calls them, should be run by experts or technocrats in order to make them free of any political disputes that may distort their initial function.

Mitrany's functionalism is, thus, a response to the need for international cooperation in a world where, on the one hand, there is a profound political and cultural diversity and, on the other hand, there is a multitude of problems that, by their very nature, cannot be resolved within the borders of the nation state and using the institutional instruments available to national states. Functionalism can be thought of as a gradual approach to economic and administrative integration based on step-by-step cooperation at different levels of social interaction.

2.3. Summing up the Functionalist Efficient Stability Thesis

Jacob Viner's efficiency-based perspective on economic integration and David Mitrany's functionalist–institutionalist perspective converge and complement each other in their shared emphasis on practical cooperation and gradual integration. To this day, their arguments remain foundational when it comes to the issue of cross-border integration and its manifest consequences and spillover effects. Whereas Viner provides the economic rationale for why countries should pursue integration (greater efficiency, lower costs, and increased prosperity), Mitrany offers the political rationale. Viner's economic logic assumes that countries will naturally seek greater efficiency by reducing trade barriers, but Mitrany highlights the need for robust institutional frameworks to manage the complexities that arise as integration deepens.

Both Viner and Mitrany advocate for gradual integration, though they approach it from different perspectives. Viner sees integration progressing as countries increasingly seek economic efficiency through trade creation, while Mitrany sees integration unfolding through the development of functional institutions that solve practical problems on a case-by-case basis. In both cases, integration is not achieved all at once but, rather, through a series of incremental steps.

This gradual approach ensures that integration is adaptive and responsive to the changing needs and challenges of the international community. Viner's customs unions may start small, involving only a few countries, but over time, they can expand as the benefits of efficiency become more apparent. Similarly, Mitrany's functional institutions may begin by addressing narrow issues, but as states work together, they build trust and capacity for cooperation, potentially leading to broader forms of integration.

Thus, Viner's and Mitrany's perspectives are mutually supportive, with Viner's efficiency-driven model providing the economic rationale for integration, while Mitrany's institutionalism offers the tools to ensure the politically peaceful stability rationale. Together, they form a framework for an argument that integration is both economically desirable and politically feasible, provided that it is pursued through a gradual, bottom-up process that is economically efficient and supported by political institutions.

As a concrete illustration of the approaches discussed above, the European Union serves as a pre-eminent example of successful economic integration. Established through a series of treaties, beginning with the Treaty of Rome in 1957, the EU has progressively removed trade barriers among member states, culminating in the creation of a single market that enables the free movement of goods, services, capital, and labor. This economic integration has significantly increased trade and investment within the union, fostering

economic growth and stability. According to Baldwin and Wyplosz (2019), the EU's single market has substantially boosted intra-EU trade, which grew from 22% of GDP in 1992 to approximately 33% by 2017. Furthermore, the EU has been instrumental in transforming Europe into a region of stability and peace.

In brief, the case for integration as the basis for functionalist efficiency and stability has been strongly supported both by the theoretical apparatus developed in the last one hundred years or so and by the practical results demonstrated by the historical experience of the second half of the 20th century.

3. Challenges of Economic Integration: Geoeconomic Risks of Interdependence

Today, we live in the most economically integrated world that history has recorded so far. Not only are our economies are massively integrated, but they have become more complex than ever, and this complexity is bolstered by the new technologies that are rapidly developing and hugely affecting every sector of human life. As noted, it was the hope of these thinkers that, once the world became fully integrated, economic ties would be strengthened, the economic well-being of every nation would drastically increase, and war would be replaced by "eternal peace".

Nevertheless, the emergence of geoeconomic ideas and practices in the last two or three decades has seriously challenged the assumptions and expectations of functionalist efficiency. Instead of entering into a new historical phase where trade and commerce completely replace conflict, we are actually witnessing the rise of a new kind of conflict that uses economic means to achieve political goals.

In the last couple of years, many authors have been engaging with this issue by using different conceptual toolkits. In the following, we illustrate the challenges posed to economic integration by focusing on two relatively new concepts and strains of literature developed in the international relations field: the geoeconomics and "weaponized interdependence" approaches.

3.1. Geoeconomic Challenges

Although there is no widely agreed upon definition of geoeconomics, we associate it with the use of economic and financial means to achieve political goals in the international arena. As tentative as it may appear, this definition tells us something about the nature of the relationship between politics and economics envisaged by geoeconomics: economic relations are put under the command of politics or, more precisely, economics is used as a means of statecraft. Initially, the concept of geoeconomics was introduced in the 1990s by Edward Luttwak, who coined the term in an article published in *The National Interest*, where geoeconomics is defined as "the admixture of the logic of conflict with the methods of commerce" (Luttwak, 1990, p. 19). Luttwak's thesis, broadly speaking, is that the end of the Cold War brought about a new form of competition between states, which departs from classical geopolitics based on the projection of military power. This new form of competition relies on economics as its primary driver. Instead of using military power and force to deter and to control one's enemy, now, one can use economic means, such as trade or investment policies or economic and financial sanctions, to achieve one's political ends.

It is often argued that the rise of China as a global power in the last two decades, along with its economic model, state capitalism, is one of the main causes of the emergence of geoeconomics today (Vihma, 2018). But geoeconomics is a specific phenomenon of our times. As Harris and Blackwill (2016) pointed out, there are three factors that determine the widespread use of geoeconomics as a means of statecraft. Firstly, the influence that markets exert today far exceeds the influence they have ever had in the past. As a consequence,

markets are one of the most efficient targets of the foreign policy of states. Secondly, modern states have far more resources at their disposal than their counterparts in the past. They can use these resources to advance their strategic interests without paying too much attention to economic efficiency considerations. Thirdly, new rising powers are more eager than ever to use economic instruments to gain influence in the international arena.

As it may seem obvious, non-democratic states are more prone to engage in geoeconomic activities than advanced democratic states. The strategic investments of China in Africa and the use of gas export by Russia as a means to establish political control over its neighboring countries are prime examples of geoeconomic activities. For instance, China's approach in Africa includes extensive investments in infrastructure projects, natural resource extraction, and manufacturing. These investments are often accompanied by favorable loan terms that bind recipient countries economically and politically to China.

Harris and Blackwill (2016) identified seven instruments of geoeconomics: trade policy, investment policy, economic and financial sanctions, cyber strategies, economic assistance, financial and monetary policy, and national policies related to energy and commodities. Trade policies, as the authors show, are often used to exert influence through tariffs, trade agreements, or embargoes, effectively shaping economic relations and dependencies. Investment policies involve direct investments or restrictions, impacting the economic landscape of both the investing and the recipient countries. Economic and financial sanctions serve as a tool to coerce or punish states by limiting their economic interactions and access to international financial systems. Cyber strategies encompass actions aimed at disrupting or stealing information—whether economic, scientific, or technological—that is used to gain leverage over an adversary's economy. Economic assistance, on the other hand, can build alliances and dependencies by providing financial aid or infrastructure development. Financial and monetary policies, such as manipulating currency values or leveraging sovereign wealth funds, can influence global markets and power dynamics. National policies related to energy and commodities are particularly impactful, as control over critical resources like oil, gas, and rare earth elements can be used to exert pressure or gain concessions from other states.

As it might be observed, states can employ a wide range of economic instruments to pursue their geostrategic interests. By integrating these tools, countries can effectively shape the international environment to their advantage. This multi-faceted approach to geoeconomics underscores not ony the shift from geopolitics to geoeconomics but also a challenge to the assumption of the functionalist stability doctrine.

3.2. Weaponized Interdependence

The geoeconomics principles were further elaborated more recently in an influential article authored by Henry Farrell and Abraham L. Newman in 2019. Their contribution investigates how states use global economic networks to assert power and influence over other nations, introducing the term "weaponized interdependence" to describe the strategic exploitation of key positions within these networks—such as finance, information, and supply chains. As they point out (Farrell & Newman, 2019, p. 44), their "account places networks such as financial communications, supply chains, and the internet, which have been largely neglected by international relations scholars, at the heart of a compelling new understanding of globalization and power".

Farrell and Newman give even more substance and conceptual clout to the questioning and reassessment of some of the claims made by the functionalist efficiency perspective on economic integration by identifying two primary mechanisms through which weaponized interdependence operates: the "panopticon" and "chokepoint" effects. The panopticon effect involves leveraging surveillance capabilities within networks to gather intelligence

and monitor activities, enabling powerful states to exert pressure through threats of exposure or sanctions. As they say (Farrell & Newman, 2019, p. 55), "States with access to the panopticon effect have an informational advantage in understanding adversaries' intentions and tactics". In such cases, this information "offers those states with access to the hub a strategic advantage in their effort to counter the specific moves of their targets, conduct negotiations, or create political frames".

Conversely, the chokepoint effect refers to the ability of dominant states to control critical junctures within networks, thereby blocking or restricting access for adversaries. This disruption can coerce compliance by causing economic isolation or depriving adversaries of essential resources. According to them (Farrell & Newman, 2019, p. 56), "Because hubs offer extraordinary efficiency benefits, and because it is extremely difficult to circumvent them, states that can control hubs have considerable coercive power". Conversely, "states or other actors that are denied access to hubs can suffer substantial consequences".

Moreover, as the authors emphasize, states do not possess equal access to or control over crucial nodes in global networks. Dominant states, particularly the United States; the European Union; and, more recently, China, benefit from their central roles in global financial, technological, and communication networks. This centrality provides these states with significant strategic advantages, allowing them to impose sanctions, restrict access to essential technologies, and manipulate financial flows to their benefit. Consequently, they can coerce or influence other states more effectively, reinforcing existing power imbalances. As Farrell and Newman note (Farrell & Newman, 2019, p. 57), "This geographic skew effectively means that only the United States and a couple of other key states and state like entities (most notably, the European Union [EU] and, increasingly, China) enjoy the benefits of weaponized interdependence, although others may still be able to play a disruptive role".

Equally important are domestic institutions, which shape the possibilities of state actions. As with geoeconomics, the political regime and domestic laws constrain both foreign policy choices and the potential to weaponize a state's position within global networks. These domestic frameworks influence how states can leverage economic and technological interdependencies for strategic advantages, limiting or enabling their capacity to use these networks as tools of coercion or influence. The key idea of the argument is that states' varying capacities to use these forms of coercion hinge on both the structure of the network they operate within and their domestic institutions. States with jurisdiction over central network hubs and strong institutional capacity can deploy both surveillance and chokepoint tactics. However, differences in institutional strength and norms may limit their use of these tools, even with jurisdiction over key hubs. When control of critical hubs is shared by a few states, they may need to coordinate to effectively leverage weaponized interdependence. Conversely, states that lack control or access to network hubs will be unable to exert these coercive measures (Farrell & Newman, 2019, p. 58).

As global integration networks have grown, a robust set of cases illustrating the validity of some of the key claims made from the geoeconomics and weaponized interdependence perspective has been established. Two of them are very salient: the crisis generated during the COVID-19 pandemic and the situation revealed by the Ukrainian conflict regarding the European dependence on Russian natural resources.

3.3. The COVID-19 Pandemic

In a relatively short period of time, China has become "the world's sole manufacturing superpower" (Baldwin, 2024). From a backward agrarian country, led by a communist party, China suddenly developed into a "formidable industrial powerhouse" (Wen, 2016). China is now "the workshop of the world—it is central to the entire global network of trade and production. Manufacturing inputs from China make up over 3.6% of every major nation's

manufacturing output" (Freeman & Baldwin, 2020a). Economists and political scientists alike have tried to explain this overwhelming economic growth of China. Nevertheless, the why of the economic success of China is not the purpose of our inquiry. We are, rather, interested in explaining how the disruption caused by the COVID-19 pandemic affected the global supply chain.

The COVID-19 pandemic caused a massive disruption of the global supply chain. A pandemic represents an exogenous factor, i.e., an external shock—similar to any other natural disaster—that can affect an economy to varying degrees. What makes the COVID-19 pandemic particularly significant is the scale of its economic impact. The pandemic erupted in late 2019 and early 2020 in Hubei, China. Due to the widespread reliance on Chinese supply chains across nearly all industries, the entire world was affected by the disruption caused by both the health crisis from the new coronavirus and the political response of the Chinese government, which imposed restrictions on the export of goods. For example, at the beginning of the COVID-19 pandemic, the Chinese government banned the export of protective masks (Hoekman et al., 2020).

As the world's largest manufacturing hub, having "a pivotal [role] in the network of dependencies" (Freeman & Baldwin, 2020b), China's factories were forced to stop production during strict lockdowns, causing massive effects across industries worldwide. According to the Global Value Chain Barometer, the lockdowns were the major source of global supply chain disruption, mainly due to labor shortages across China (Hong & Betti, 2023). Some of the economic effects of the lockdowns in China included shortages of raw materials, components, and finished goods. They significantly caused delays and increased costs for businesses reliant on Chinese production.

The lockdowns had a huge impact on the global supply chain, especially in high-tech industries such as the automotive, electronics, and pharmaceutical industries (Javorcik, 2020). The high reliance on the Chinese supply can also be demonstrated by China's share in G7 total imports of medical supplies (European Bank for Reconstruction and Development, 2020): 50% of first-aid kits, 30% of blood thinners, 30% of antibiotics, and 30% of medical bandages.

As a further illustration, in 2020, the South Korean automobile industry, particularly Hyundai, faced significant challenges due to the COVID-19 pandemic, especially because of the lockdown measures in China. As a key supplier of parts for the global automotive sector, China's strict lockdowns led to many factory shutdowns, disrupting the global supply chain. Hyundai was one of the first automakers to experience the impact of this disruption (Miroudot, 2020). Early in 2020, the company had to temporarily halt production at its South Korean factories because of a shortage of critical components, like wiring harnesses, sourced from China. This was one of the earliest instances of an automaker outside of China stopping production due to pandemic-related supply chain issues. Nevertheless, Hyundai was able to bounce back relatively quickly by focusing on expanding its electric vehicle (EV) lineup and adopting strategies to lessen the risk of future supply chain disruptions. The pandemic also encouraged Hyundai to diversify its supply chain and boost domestic production of certain components to decrease dependence on foreign suppliers.

Moreover, the COVID-19 pandemic significantly affected the semiconductor industry. Given China's role as the major hub for semiconductor fabrication and packaging, lockdowns and factory closures led to severe deficits in semiconductor parts. The pandemic further disrupted the availability of key inputs for microchip manufacturing, compounding the problems of manufacturing industries. While there was a global effect of this shortage on all industries, the automobile industry, which is heavily reliant upon semiconductors, was the most affected. For instance, Ford announced production stoppage in some of its factories due to a scarcity of microchips. In 2021, Ford implemented a temporary halt on

the operations of its assembly plants in Michigan, Illinois, and Ohio, resulting in a huge backlog of vehicles waiting to be shipped out (Howard, 2021). It is worth noting that the semiconductor deficiency worked directly against American automobile producers, in addition to leading to higher costs for end customers, thereby increasing the deep impact that semiconductor supply chain interruptions had on the world economy.

The economic disruptions caused by the COVID-19 pandemic are an illustration of the broader dilemmas of global integration. While integration brings significant economic benefits through efficiency and cooperation, it also increases the risk of strategic vulnerabilities in times of global disruptions, creating dilemmas for policymakers as they attempt to balance economic openness with the need for resilience and security. According to Baldwin and Freeman (2021), while global supply chains are risky, they also provide economic benefits in terms of cost efficiency and innovation. There is an inescapable trade-off between risk and reward that should be central to any future discussion about globalization. According to Javorcik, "COVID-19 has exposed vulnerabilities of the global supply chains to disruptions as well as what many may consider an excessive reliance on China for supplies". As he further argues, "[firms] will need to diversify their supplier base to protect against disruptions affecting a particular producer or a particular geographic location" (Javorcik, 2020).

In summary, the COVID-19 pandemic highlighted two important points: (1) China's central role in global supply chains, which makes the entire world economy dependent on Chinese exports of both intermediate and final goods. (2) The shock to the Chinese economy had repercussions far beyond its internal markets; such a shock can significantly impact global supply chains, affecting entire industries in North America, Europe, and Asia. This over-reliance on the Chinese supply chain creates not only economic vulnerabilities, as illustrated above, but also strategic and geopolitical vulnerabilities. As Farrell and Newman (2019) pointed out in their analysis of weaponized interdependencies, China's dominant position in global supply chains allows it to wield significant power, creating potential security risks for other nations that heavily depend on its exports. The pandemic underscored how supply chain dependencies can be weaponized, influencing everything from trade policies to national security strategies. This has prompted many countries to reconsider their supply chain dependencies and explore diversification strategies to mitigate these risks, including reshoring and building more resilient, diversified supply chains.

3.4. Europe's Reliance on Russian Gas

For years, European countries, particularly Germany, have heavily depended on Russian gas for their energy needs (Siddi, 2016). This interdependence was initially seen as mutually beneficial in the standard functionalist efficiency strategic logic: Russia gained revenue from gas exports, and Europe secured a steady supply of relatively cheap energy. However, this dependence created a significant strategic vulnerability for Europe. As highlighted in the concept of weaponized interdependence, when one party in an interdependent relationship holds control over a critical resource or network (such as energy), it can use this position to exert coercive power over the other party.

The 2022 invasion of Ukraine illustrated the risks of this dependency, leading to unprecedented disruptions in energy flows and sparking a crisis across Europe. European nations, recognizing the dangers of relying too heavily on Russian gas, have since diversified their energy sources, increasing their investments in renewable energy, seeking alternative gas suppliers, and even reconsidering the role of nuclear power in their energy mix (Wehrmann, 2024). The war not only reshaped Europe's energy landscape but also underscored the broader strategic risks of global interdependence, where economic ties can be weaponized to exert influence and destabilize rivals.

Nevertheless, during the Ukraine war, Russia leveraged its energy dominance to influence European foreign policy. By threatening to cut off or reduce gas supplies, Russia sought to pressure European countries to moderate their support for Ukraine, knowing that Europe's economy and daily functioning were deeply reliant on energy imports (Sampedro et al., 2024). This is a clear illustration of "chokepoint" power, one of the mechanisms of weaponized interdependence identified by Farrell and Newman (2019). The chokepoint effect occurs when a state controls a critical juncture in a global network, such as gas pipelines, and uses this control to impose economic costs or isolate adversaries.

The war in Ukraine vividly demonstrated that energy interdependence can be weaponized to further political aims. Russia's strategic use of gas supplies not only sought to exert pressure on European governments but also attempted to drive a wedge between European countries, as different nations have varying levels of dependency on Russian gas. For example, countries like Germany and Hungary were more vulnerable to gas cutoffs than others, creating friction within the European Union's unified response to the war.

The risks of energy dependence were highlighted by the realization that energy supplies can empower politicians to wield energy as a strategic tool, either to strengthen alliances or to undermine them within multinational organizations such as the EU. In response, Europe has undertaken various initiatives to enhance its energy security, primarily by diversifying suppliers, reducing consumption, and accelerating renewable energy transitions. These are, however, significant changes that require a gradual approach, substantial investment, and collective effort. Additionally, alternative sources, such as Azerbaijani gas (Corbeau & Mitrova, 2023), come with their own infrastructure and capacity limitations, complicating the transition to a sustainable energy mix as much as reliance on a single supplier.

As with China's exports, Europe's dependence on Russian gas exemplifies the geoeconomic dimension of weaponized interdependence, where economic tools—such as energy—are leveraged to achieve political aims. This dependence not only exposes vulnerabilities within interdependent relationships but also challenges the assumption that economic interdependence alone fosters peace and stability. Instead, it illustrates how interdependence can be exploited as a weapon in geopolitical conflicts, turning mutual economic ties into sources of strategic pressure.

Moreover, the situation underscores the dual-edged nature of globalized economies: while interdependence can encourage cooperation, it also creates points of leverage that nations may exploit in pursuit of broader geopolitical strategies. For Europe, this reality has necessitated a reassessment of energy policies and a strategic pivot towards enhancing resilience by reducing its reliance on any single supplier. However, this shift presents its own challenges, requiring time, significant capital, and coordination across member states. As Europe embarks on this path, the question remains whether such measures can fully shield it from future geoeconomic coercion or if a more comprehensive framework for energy security will need to be developed.

4. Trade-Offs and a Realistic Framework

All of the above allows us to revisit and reassert the problem of economic integration and interdependence through a new pair of conceptual lenses, historical experiences, and case studies available today. The direction of the emerging approach is rather clear. We need a mixed approach that combines considerations of functionalist efficiency with those based on geopolitical and weaponized interdependence reasoning. This is a realistic approach—one where the issue of trade-offs between the two dimensions becomes central.

In this respect, we also have a reference point in the intellectual history of political economy and international relations. The classical work, *Power versus Plenty*, by Jacob Viner

stands as an example. In his classical study on mercantilist thought, published in 1948, Viner examines how power and plenty were regarded as objectives of foreign policy in the seventeenth and eighteenth centuries in Europe. Contrary to the widely prevalent view in the literature, which sees mercantilism either "as primarily a system of state building" (Gustav Schmoller) or as an economic and political philosophy that "sought power rather than or much more than plenty" (William Cunningham and Eli Heckscher), Viner argues that "in the age of mercantilism wealth and power were both sought for their own sakes" (Viner, 1948, p. 13). Hence, while acknowledging the emphasis on power as a goal of mercantilist policy, he notes that both "power" and "opulence" (wealth) have always been and must be central to any economic policy.

Viner continues by distinguishing between the eras of mercantilism and *laissez-faire*, noting a shift in priorities: whereas mercantilist policies primarily aimed at enhancing state power, often viewing wealth as a means to this end, the nineteenth century and the era of laissez-faire marked a transition towards prioritizing wealth creation, with less regard for its impact on state power.

But Viner's analysis can be further extended. These fundamental tensions exist in any economic system or in any economic doctrine to be applied to economic units such as countries. Viner's argument is that this shift, from the age of mercantilism to the *laissez*-faire era, does not negate the importance of power in mercantilist thought but, rather, highlights a trade-off between power and wealth that mercantilist policies navigated. He points out that, during the seventeenth and eighteenth centuries, economic activities like colonial trade, the fisheries, and the slave trade were seen as vital sources of national wealth but were accessible primarily to countries that could secure them through military strength:

> In the seventeenth and eighteenth centuries, colonial and other overseas markets, the fisheries, the carrying trade, the slave trade, and open trade routes over the high seas, were all regarded, and rightly, as important sources of national wealth, but were available, or at least assuredly available, only to countries with the ability to acquire or retain them by means of the possession and readiness to use military strength. (Viner, 1948, p. 6)

This period did not consider "power" merely in terms of conquest or prestige but also as a means of ensuring national security and protecting the nation's political and religious freedoms. Thus, Viner's analysis suggests that the mercantilist emphasis on power was not irrational or solely focused on power for its own sake. Instead, it reflected a complex understanding of the role of power in safeguarding national interests and economic prosperity:

> Given the nature of human nature, recognition of power as an end in itself was therefore then neither peculiar nor obviously irrational unless there is rational ground for holding that the promotion of economic welfare is the sole sensible objective of national policy to which every other consideration must be completely subordinated. (Viner, 1948, pp. 6–7)

As an illustration of the inherent trade-off between the national interest and individuals' interest, Viner stresses the lack of harmony between the economic interests of individual merchants or specific business groups and the broader economic interests of the nation. He points out that while mercantilist doctrine emphasized the importance of national economic interests, it also recognized the potential conflict between these and the special economic interests of individuals or particular economic classes. While mercantilist doctrine emphasized the significance of national economic interests, it also highlighted the potential for discord between the specific economic interests of individual merchants, business groups, or economic classes and the overall economic interests of the nation as

a whole. "Refusal to give weight to particular economic interests, therefore, must never be identified with disregard for the national economic interest as they conceived it, in interpreting the thought of the mercantilists" (Viner, 1948, p. 19).

These tensions and dilemmas, as highlighted by Viner, are fundamental and become even more important when the economic space becomes integrated in multiple ways at the global level. Our argument is that if one can identify, even in the mercantilist perspective, such a structure of trade-offs, then, even more, we should be aware of these trade-offs when it comes to the contemporary global economic system. The point is to recognize a balance between pursuing economic welfare and maintaining national security, challenging the notion that economic policy should singularly focus on economic welfare to the exclusion of all other national objectives or the other way around.

Today, two major trade-offs define the approach to the problem. The first is the trade-off between economic efficiency and resilience. The second is the trade-off between stability and competition/rivalry.

4.1. Economic Efficiency Versus Resilience

In his classical definition of resilience, C.S. Holling defines it as "the persistence of relationships within a system" and "a measure of the ability of these systems to absorb changes of state variables, driving variables, and parameters, and still persist" (Holling, 1973, p. 17). In other words, resilience refers to a system's capacity to endure disruptions and adapt in ways that maintain its essential functions, structures, and feedback.

On the other hand, economic efficiency refers to both the optimal allocation of resources to maximize output and the minimization of waste or unnecessary costs (Hausman & McPherson, 1996). In this classical sense, an economically efficient system is one in which goods and services are produced at the lowest possible cost and distributed according to consumer demand. Thus, efficiency seeks to optimize operations, minimize redundancies, and boost productivity, often by focusing on cost-reduction measures and specialization.

As can be easily observed from the above definition, there is an inherent tension between economic efficiency and resilience. Economic efficiency promotes optimization of a system that may, eventually, render it vulnerable in the face of unexpected disruptions. Having focused on cost cutting and specialization, economically efficient systems could decrease their ability to respond adaptively to crises and, therefore, compromise resilience. In contrast, resilience emphasizes maintaining robustness and flexibility, even if this requires maintaining redundancies, buffer stocks, or alternative pathways that might appear inefficient under normal conditions. Resilient systems are designed to absorb shocks and continue functioning, prioritizing adaptability over strict optimization.

In the context of global interdependencies, the trade-off between economic efficiency and resilience is even more acute. While economic efficiency seeks to optimize production, it can create vulnerabilities when supply chains are disrupted, as our case studies discussed above prove. On a global scale, where resources and labor are sourced from interdependent markets, strict efficiency can lead to fragility. Conversely, resilience encourages strategies such as diversification and redundancy to absorb shocks. Although often less cost-effective in the short term, resilient systems are better prepared to adapt to and endure unforeseen global disruptions.

4.2. Peace or Stability Versus Competition or Rivalry

Economists consider competition to be at the forefront of economic progress. Competition improves products, reduces prices, and drives innovation by pushing firms to find more efficient ways to meet consumer demand (McNulty, 1968). Additionally, competition

functions as an allocative mechanism: it channels resources toward the most efficient firms, allowing those that can deliver goods and services at lower costs or with higher value to thrive. This process not only enhances overall productivity but also ensures that scarce resources are used in ways that best satisfy consumer preferences.

When competition extends into international markets, it not only fosters global economic integration but also creates opportunities for exercising geoeconomic pressures or weaponizing interdependence. Countries can leverage their control over critical resources, technology, or financial networks to influence other nations' economic or political decisions. Thus, economic competition and interdependence contribute not only to peace and stability—as argued by the classical functionalist approach of efficient stability—but also to political rivalry. Our explanations so far have demonstrated that increased economic competition often correlates with heightened political competition or rivalry. Economic competition, in itself, does not inherently bring about peace or stability; rather, it intensifies interdependence, which can be conducive to geoeconomic strategies.

In brief, while interdependence can reduce the likelihood of conflict by creating mutual economic benefits, it also opens pathways for states to exert influence and leverage dependencies. Therefore, economic competition is a double-edged sword: it promotes integration and interdependency, which can support peaceful relations, but it also amplifies opportunities for strategic rivalry in the global arena.

5. Conclusions

Our approach, which highlights both the benefits and costs of economic and political integration, calls for a renewed examination of economic doctrines and the implications of current global economic integration trends. Comparisons with mercantilism and comparisons to nineteenth-century economics and twentieth-first-century economics are a good source of insights. But, more importantly, from a conceptual point of view, we need to develop our ability to identify and explore the varieties of trade-offs and tensions intrinsic to the emerging new global economic system.

Prioritizing a single criterion for economic analysis and policy making is dangerous because it fails to capture the complexity of the global economic system, leads to oversimplified and potentially harmful policies, and is inadequate for addressing the multifaceted challenges and opportunities presented by global economic integration. The naive belief in prioritizing a single criterion, such as plenty, power, resilience, or justice, to the exclusion of others in the formulation of economic policy and analysis poses significant risks, particularly in the context of the new global economic integration trends.

The COVID-19 crisis and Europe's reliance on Russian gas illustrate not only the necessity of rethinking integration strategies but also the importance of designing institutional frameworks that balance efficiency with resilience and security. The COVID-19 pandemic exposed the fragility of global supply chains and the risks of overdependence on a single manufacturing hub, such as China. The disruptions to supply chains, particularly in essential sectors like medical supplies and semiconductors, highlighted the importance of diversification as a strategy to enhance resilience. Governments and corporations worldwide are increasingly acknowledging the need for greater flexibility in sourcing and production. The pandemic's economic consequences also underscored the importance of preparedness and adaptability, pushing policymakers to integrate risk assessment and crisis management into their planning for global economic activities.

Similarly, Europe's reliance on Russian gas demonstrates the geostrategic risks of dependence on a single or dominant supplier for critical resources. This dependence not only created economic vulnerabilities but also became a tool for political coercion, as seen during the Ukraine conflict. The chokepoint power wielded by Russia through its energy

dominance served as a stark reminder of how interdependence can be weaponized. This situation has prompted Europe to undertake significant steps toward energy diversification, accelerating investments in renewable energy and reducing reliance on external suppliers.

Consequently, the current trends in global economic integration demand a nuanced understanding of the trade-offs and tensions inherent in the global economic system. Economic integration brings benefits such as increased trade, investment, and cooperation, but it also introduces vulnerabilities, such as exposure to global financial shocks, exposure to geoeconomic risks, and the erosion of autonomy in economic policy making. A singular focus fails to appreciate the strategic need to balance openness with policies critical for social stability, security, social cohesion, justice, and resilience.

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Review

A Comparative Analysis of the Belt and Road Initiative with Other Global and Regional Infrastructure Initiatives: Prospects and Challenges

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Abstract: The Belt and Road Initiative (BRI) is the first and currently the most expansive global infrastructure initiative, notably for its scale and emphasis on connectivity. In response, alternative initiatives such as the Partnership for Global Infrastructure and Investment (PGII) and Free and Open Indo-Pacific Strategy (FOIP), including their components the Blue Dot Network (BDN) and Partnership for Quality Infrastructure (PQI), as well as Global Gateway (GG) and the Three Seas Initiative (3SI), have emerged to counterbalance the BRI's influence and promote more transparent, sustainable, and rules-based infrastructure frameworks. This review investigates how global and regional infrastructure initiatives—namely PGII/BDN, GG, FOIP/PQI, and 3SI—compare with the BRI in terms of development objectives, implementation models, institutional structures, and implications for developing economies. Adopting an inductive approach, this review identifies key themes from the literature to evaluate these initiatives across seven dimensions: (1) infrastructure objectives, (2) the quality and transparency of investments, (3) investment policy orientation, (4) trade policy orientation, (5) inclusivity and regional integration, (6) coordination mechanisms, and (7) environmental sustainability. While PGII/BDN, GG, FOIP/PQI, and 3SI appear well-positioned to address some of BRI's shortcomings, the evidence does not clearly favour one model over another in terms of achieving welfare-enhancing outcomes and bridging development gaps. Nonetheless, strategic competition and complementarities among the connectivity policies of multiple initiatives can ultimately contribute to more accountable, multidimensionally sustainable, and socially inclusive infrastructure development. We also illustrate how stated preference methods, i.e., willingness to pay (WTP) and willingness to accept (WTA), can be used to quantify the value of soft infrastructure, particularly public preferences for sustainable investment and norm diffusion, which are central to evaluating the social welfare gains from participating in these initiatives.

Keywords: quality infrastructure; hard and soft infrastructure; economic development; official development assistance; private sector investment; public–private partnership; sustainability standards; governance; transparency; connectivity; commerciality; complementarity; bilateralism; multilateralism

JEL Classification: F51; F52; P51; P52

1. Introduction

While there are economic benefits to developing countries from infrastructure projects implemented under the Belt and Road Initiative (BRI), there are perennial concerns such as the expansion of China's economic and geopolitical influence, economic security vulnerabilities, debt-trap diplomacy, socially inefficient compensation rates to landowners, the insufficient engagement of local stakeholders, the halting and cancellation of infrastructure projects, and questionable labour and environmental standards.

Additional concerns that are rarely discussed in the literature but are of immense importance are the not-in-my-backyard (NIMBY) issues and the challenge of using cost–benefit analysis (CBA) in developing countries (Quah & Iuldashov, 2020). The conflict between demands for consumption and growth and demands for a higher quality of life is central to every case of NIMBY. NIMBYs are becoming more and more widespread in recent times due to rising affluence, greater educational opportunities and higher literacy rates, wider information dissemination, globalisation, the distrust of governments and private corporations, the increasing demand for energy, and the expansion of facilities to meet economic growth objectives. Even before any of the available conflict resolution instruments are used for NIMBYs, projects need to be assessed through properly tuned and adapted valuation techniques of CBA. CBA is meant to provide a systematic evaluation based on economic principles, along with transparency and accountability. Taking into account both tangible and intangible benefits and costs, it includes environmental impacts, ecosystem goods and services, normative preferences and so forth. Expressing gains and losses using the measuring rod of money allows for comparisons with economic impacts. The fundamentals of CBA for both developed and developing countries are the same. However, in applying the principles, specific valuation techniques commonly used in developed countries are not as appropriate for developing countries. Labour, goods and financial markets differ between developing and developed economies, and these differences may result in erroneous CBA if certain valuation techniques are used. As such, these intricacies between countries are rooted in varying and unique preferences and needs for infrastructure among the developing countries. Therefore, unsurprisingly, the market for global and regional infrastructure initiatives is vast and it is quickly being filled with competitors.

To counter or complement BRI cooperation, several alternatives to BRI have emerged including the Build Back Better World (B3W) in June 2021 (rebranded as the Partnership for Global Infrastructure and Investment (PGII) in June 2022), led by the U.S. and G7 partner countries; Global Gateway (GG), which was launched in 2021 by EU member states; Japan's Partnership for Quality Infrastructure (PQI), which was launched in 2015 as a key component of the broader Free and Open Indo-Pacific Strategy (FOIP) and was formalised in 2016; the Blue Dot Network (BDN), which was founded in 2019 by the U.S. in collaboration with Australia and Japan, providing a certification mechanism for PGII and FOIP; and the Three Seas (Baltic, Adriatic, and Black Sea) Initiative (3SI) which was founded by 12 EU countries in 2015.

While the empirical literature on infrastructure development has focused heavily on China's BRI, there remains limited systematic comparative analysis studies across the BRI and other emerging global and regional infrastructure initiatives. Mutlu (2023) applies a geoeconomic framework based on Blackwill and Harris (2016) to compare the BRI, PGII, and GG across dimensions such as trade policy, investment tools, sanctions, energy, foreign aid, and cyber elements. Siddiqa and Abbas (2022) offer a more narrative-driven account of the competition and complementarity between the BRI and PGII in the Middle East, with a focus on financing models, institutional mechanisms, and development standards. Based on a media content analysis of focus group discussions with key stakeholders involved in

the BRI's policy framework, Shah et al. (2022) derived comparison indicators pertaining to inclusivity, capacity, labour protection, anti-corruption, the incorporation of local needs, head start, cohesiveness, commitment, debt trap, mistake allowance, focus, sustainability, and regional peace. Matsumura (2019) employs a geoeconomic lens to compare the BRI and FOIP, distinguishing between genuine strategic articulation and propaganda use in official documents. On the contrary, Nagy (2021) uses a regionalism matrix analysis framework to compare the BRI and FOIP. Simonov (2025) compares the BRI and PGII across governance, sustainability, financing, and geopolitical dimensions from the perspectives of Sinocentric globalisation and U.S.–China competition. Dziewiałtowski-Gintowt (2019) compares the BRI and 3SI from a synergistic perspective in terms of their investment priorities, objectives, principles and infrastructure projects given their mutual interest to develop economic corridors passing through Central and Eastern Europe. Other studies offer a less direct analytical comparison between the BRI and its counterparts, e.g., Grieger (2021), Gaens and Sinkkonen (2023), Heldt (2023), Karjalainen (2023), and Zbińkowski (2019), primarily examining the narrative and features behind one of the alternative initiatives—such as FOIP/PQI, GG, or 3SI. While the BRI is often referenced in these types of studies, the comparisons tend to be more implicit or discursive, reflecting the reality that many of these initiatives have emerged, at least in part, as responses to the BRI.

Building on this emerging body of work, this review identifies two key gaps. First, most comparative studies focus narrowly on the BRI and one or two other initiatives, limiting the breadth of comparative insight. Second, while some studies examine selected benefits and trade-offs, few offer a systematic, multi-dimensional evaluation of both perceived advantages and drawbacks across all major Western and allied infrastructure initiatives. Although recent contributions such as Mutlu (2023) and Nagy (2021) provide valuable insights using established frameworks, a more flexible and comprehensive approach that is grounded in themes identified across the literature can better inform CBA practitioners seeking to assess the optimal social welfare outcomes associated with participation in each initiative.

Thus, this study seeks to address the following research question: how do the other major infrastructure initiatives compare with the BRI in terms of development objectives, governance models, financing mechanisms, and implications for developing economies? Rather than applying a formalised framework, we adopt a bottom-up, inductive comparative approach, identifying key themes from the academic literature, policy documents, media articles, and official communications. We evaluate the following initiatives—the BRI, PGII/BDN, GG, FOIP/PQI, and 3SI—across seven dimensions: (1) infrastructure objectives, (2) the quality and transparency of investments, (3) investment policy orientation, (4) trade policy orientation, (5) inclusivity and regional integration, (6) coordination mechanisms, and (7) environmental sustainability. This approach offers flexibility and breadth, capturing the evolving landscape of global and regional infrastructure initiatives that remain underexplored in their totality. Our aim is to provide a comprehensive foundation for future research to build upon using more formalised comparative frameworks. These initiatives were chosen based on three practical criteria: (1) the scale and scope of their financial commitments, (2) their explicit or implied policy positioning as alternatives or complements to the BRI, and (3) their backing by major geopolitical actors, including G7 countries, the EU, Japan, and Central and Eastern European states. CBA, when appropriately contextualised, can help policymakers evaluate the trade-offs among the available infrastructure alternatives in their respective regions.

Finally, we draw on an existing methodology from the literature to illustrate how soft infrastructure elements—such as transparency, sustainability certification, and norm diffusion—can be valued using stated preference techniques like willingness to pay (WTP) and willingness to accept (WTA). These preferences influence infrastructure funding decisions and outcomes but are not fully captured by conventional metrics. This is especially pertinent given the scale of these initiatives: PGII committed USD 600 billion towards global infrastructure investment from 2022–2027, FOIP pledged USD 75 billion by 2030 for the Indo-Pacific region, GG promised to mobilise EUR 300 billion (USD 318 billion at the 2023 exchange rate) for global infrastructure between 2021 and 2027, and an estimated funding need of EUR 650 billion (USD 690 billion at the 2023 exchange rate) has been cited for addressing infrastructure gaps across 3SI member states (13 Central and Eastern European countries[1]) by 2030 (see Table 1).

Table 1. General comparison between global and regional infrastructure initiatives.

	Belt and Road Initiative (BRI)	**Partnership for Global Infrastructure and Investment (PGII)**	**Global Gateway (GG)**	**Free and Open Indo-Pacific Strategy (FOIP) and Partnership for Quality Infrastructure (PQI)**	**Three Seas Initiative (3SI)**
Inception	2013	2022	2021	2016	2015
Funding	USD 1.175 trillion (invested and contracted) (Nedopil, 2025)	USD 600 billion by 2027 (pledged) (Minister of International Development Canada, 2023)	USD 318 billion between 2021 and 2027 (pledged) (The EurAsian Times, 2023)	FOIP: USD 75 billion by 2030 (pledged) (Murakami & Kaushik, 2023) PQI: USD110 billion from 2015 to 2020 (budgeted), increased to USD 200 billion in 2016 (Gaens & Sinkkonen, 2023)	USD 690 billion by 2030 (required) and EUR 928 million (committed), with target budget of EUR 3–5 billion (Seno, 2023; Wilczek & Rudowski, 2024)
Regional Focus	Global (Global South-focused, with strongest operational presence in Asia)	Global (Global South-focused)	Global (Africa-focused, Latin America, Asia, Eastern Europe)	Indo-Pacific, Asia	Central and Eastern Europe (Baltic, Adriatic, and Black Sea countries)
Objectives	Infrastructure; energy, trade, connectivity	Quality infrastructure; connectivity, supply chain resilience, domestic job creation and social expenditure, climate and health security, gender equality and equity	Quality infrastructure; connectivity, supply chain resilience, climate, health, and food security, transport, education and research	Quality infrastructure; trade, connectivity, sustainability, maritime security	Infrastructure; energy, transport, digital connectivity
Financing Model	Primarily state-funded	Private sector mobilisation + G7 public funding	EU grants/loans + private capital mobilisation	ODA loans + private partnerships	Private + national/EU public funds
Governance	Bilateral (state-led)	Multilateral, rules-based (G7-led coalition)	Multilateral, rules-based (EU institutions)	Multilateral, rules-based (Japan-led, U.S.-supported)	Multilateral (3SI-led coalition)

2. Comparison of BRI with Other Global and Regional Infrastructure Initiatives

China's first-mover advantage, being the major global infrastructure initiative of its kind in the 21st century, has set the bar for other alternative initiatives. PGII/BDN, GG, FOIP/PQI, and 3SI, while not just economic ventures, are widely seen as geopolitical responses to China's growing influence through the BRI. Since the inception of the BRI in 2013, China has also recognised the importance of sustainability development goals pertaining to green growth, health and digital infrastructure and critical resource extraction from less habitable regions. The BRI has evolved into an umbrella initiative comprising the Silk Road Economic Belt, the 21st Century Maritime Silk Road, and several thematic extensions such as the Green Silk Road, Health Silk Road, Digital Silk Road, Polar Silk Road, and Space Silk Road. However, while China's domestic capabilities are impressive, the international impacts of these initiatives remain mixed. As a result, these alternative initiatives are expected to not only rival the BRI in terms of its existing substantial impact on investment and connectivity but also improve upon its weaknesses, particularly in areas such as transparency, governance, and sustainability. This expectation places more pressure on these initiatives to avoid mistakes, as they must demonstrate their ability to offer a superior alternative to the BRI.

Besides competition, by focusing on different aspects of infrastructural development, and tapping on different markets and financial instruments, these alternative initiatives are said to be complementary to the BRI in some ways as well. The crucial question then is as follows: how successful would these initiatives be in putting pressure on China's evolving BRI framework and in covering the bases of fair, inclusive and sustainable trade interconnectedness?

2.1. Infrastructure Objectives

Differences in infrastructure focus reflect deeper divergences in development philosophies and priorities, strategic interests and comparative advantages. These initiatives often balance trade-offs and complementarities between competing goals: maximising economic efficiency versus promoting social welfare, expanding geopolitical influence versus minimising security risks, and pursuing rapid development versus ensuring environmental sustainability and fair labour conditions.

The emphasis on quality infrastructure and private funding models are areas where PGII, GG, FOIP/PQI and 3SI share similarities with each other and where they differ from the BRI's approach, which focuses on "standard" infrastructure and state-funded financing models (Grieger, 2021). Both PGII and GG are framed as normative contrasts to the BRI's state-led model, particularly in terms of democratic values, transparency, high standards, and equal partnerships. The language of EU fact sheets and speeches places stronger emphasis on strengthening supply chain resilience, particularly by reducing strategic dependencies on China. GG is framed as an EU-external cooperation strategy aimed at securing sustainable and reliable infrastructure connections. In contrast, PGII—while also globally oriented—places relatively more focus on the Global South and includes strong domestic policy framing within the U.S., emphasising job creation and middle-class economic security (Mutlu, 2023). As highlighted in a textual analysis of official declarations, 3SI shares similarities with the BRI in its focus on overarching goals such as connectivity, commerciality, and complementarity. However, while these themes appear with comparable proportional frequency across both initiatives, the term 'cooperation' appears significantly less frequently in 3SI documents relative to the BRI, suggesting a particularly strong emphasis on cooperative rhetoric within BRI communications.

Although the BRI includes a maritime component through the 21st Century Maritime Silk Road, its primary emphasis remains on trade facilitation and economic infrastructure, particularly port construction and supply chain connectivity. In contrast, FOIP's maritime pillar centres on security cooperation, freedom of navigation, and maritime law enforcement (Gaens & Sinkkonen, 2023). In addition, 3SI also holds significant geopolitical and energy security implications. A key initiative is the North–South Gas Corridor, which will facilitate the supply of American liquified natural gas (LNG) to Central Europe. This project is poised to reduce the region's dependence on Russian gas imports, particularly in Central and Eastern European countries, and challenges Germany's plans to establish a gas trading hub with Russia (Dziewiałtowski-Gintowt, 2019). Plans to transition away from fossil fuels toward renewable energy are also underway, driven in part by the Three Seas region's significant potential for solar photovoltaic deployment (Wilczek & Rudowski, 2024). While the alternative initiatives share broad normative alignment around rule-based order, connectivity, quality investments and support for developing countries, FOIP places greater emphasis on maritime security, and 3SI focuses more heavily on energy security —distinguishing them in strategic orientation from PGII and GG. In contrast to globally scoped initiatives such as PGII and GG (albeit with certain regional priorities), FOIP/PQI and 3SI are primarily regionally anchored strategies aimed at enhancing connectivity and autonomy in geoeconomic-sensitive zones—the Indo-Pacific/Asia and Central and Eastern Europe, respectively.

Infrastructure can be broadly categorised into (i) hard physical infrastructure (e.g., roads, railways, ports), (ii) ICT infrastructure (e.g., broadband, mobile networks), and (iii) soft infrastructure (e.g., border efficiency, legal frameworks, institutional quality). While both physical and ICT infrastructure fall under the "hard" category, their impacts differ sharply. Zaninovic et al. (2024) found that hard physical infrastructure has minimal influence on trade, whereas ICT and institutional efficiency have significant positive effects, particularly on supply chain trade. Fung et al. (2005) found that soft infrastructure, i.e., the quality of market institutions, plays a more significant role in attracting FDI inflows relative to hard infrastructure. In this regard, PGII, GG, and FOIP may hold an advantage. The investments under PGII are oriented towards soft aspects of development, namely climate security, health security, digital technology and connectivity, and gender equity and equality (Siddiqa & Abbas, 2022). The investments under GG also emphasise these soft aspects (but less explicitly gender equality) with the addition of food security, transport, education, and research (Mutlu, 2023).

Comparatively speaking, the BRI primarily promotes the hard aspects of development, i.e., the building of infrastructure overseas by leveraging China's comparative advantage in manufacturing value chains. Likewise, even though FOIP promotes a rule-based regional order that comes with soft infrastructure components, its infrastructure implementation pillar PQI primarily focuses on quality physical infrastructure in the areas of transportation, water management and energy in Asia (Katada, 2020; Gaens & Sinkkonen, 2023). Similarly, 3SI primarily focuses on both physical and digital infrastructure in Central and Eastern Europe. The quality of infrastructure—including electricity supply, air transport, roads, ports, and railways—in 3SI countries (which are primarily new EU member states) trails behind that of their non-3SI counterparts (older, more developed EU member states), underscoring the need to invest in critical infrastructure development (Zbińkowski, 2019). Ultimately, the dichotomy between hard and soft infrastructure may be misleading. They are not substitutes but complements. Without roads and electricity, digital services cannot operate; without institutional quality and digital literacy, physical infrastructure underperforms.

2.2. Quality and Transparency of Investments

Upholding the quality of infrastructure investments is important to ensure that projects are executed transparently, safely and reliably under good governance and that fiscal[2], social and environmental sustainability standards are met. BDN complements PGII and FOIP projects by assessing and endorsing infrastructure that meets high standards of transparency, sustainability, and developmental impact, providing them with an external certification of quality. The OECD took over the technical and operational responsibilities for the global certification process of BDN in June 2021. The OECD's credibility as an authority stems from its perceived neutrality—neither closely aligned with neoliberal orthodoxy nor fully committed to Keynesian interventionism, allowing it to be broadly accepted across diverse political and economic contexts (Ashbee, 2021). In contrast, where EU funds are involved, the EU embeds its standards into the funding and approval processes of GG and relevant 3SI projects, without relying on a separate certification mechanism.

The BRI has been criticised to be relatively less transparent in terms of the magnitude, scale and clauses of its projects and their financing. China's official GDP growth data was also suspected to be significantly overstated at times as lower-level officials have an incentive to over-report to show that they have attained high economic growth rates in their respective provinces. Therefore, China's GDP indicator alone may provide a misleading signal of its economic health in financing its BRI in the meantime (Matsumura, 2019). Moreover, it was reported that creditors command large control over foreign borrowers, giving the latter less flexibility to restructure their debts, default on their loans without risking the collateralisation of strategic assets, or introduce more stringent environmental and labour standards in contractual terms (Gelpern et al., 2022). The "hidden debt" incurred by developing BRI countries was estimated to be USD 385 billion by 2017 (Grieger, 2021). Another example concerns the USD 1.5 billion Chinese loan taken to finance the construction of the BRI's Belgrade–Budapest rail line, which aims to improve connectivity between China and Europe. This project was awarded without a competitive bidding process, i.e., a public tender, which potentially constituted illegal state aid by bypassing EU legal frameworks that emphasise transparency and competition in public procurement (Dziewiałtowski-Gintowt, 2019).

A lack of transparency not only increases the likelihood of infrastructure projects being opposed as NIMBY facilities due to diminished public trust but also imposes additional costs on firms bidding for such projects, stemming from information asymmetry, corruption, and ill-defined property rights. Generally, the degree of transparency in economic policymaking has been shown to be highly and positively correlated with a country's attractiveness to foreign direct investment (FDI). Based on a transparency index ranking of various countries that assesses "the level of corruption, law and order, bureaucratic quality, contract viability and the risk of government expropriation of private assets", it was found that a one-point increase in transparency ranking is associated with a 40% increase in FDI (Drabek & Payne, 2002). Increased FDI not only injects capital but also promotes knowledge transfer, job creation, and productivity gains. These dynamic spillover effects can significantly amplify the economic benefits of infrastructure projects beyond their initial investment costs, especially in developing economies where such benefits are most critical. Consequently, initiatives like PGII/BDN and GG, through their emphasis on transparent project standards and contractual terms, may offer greater long-term economic gains by strengthening investor confidence. However, potential shortcomings in assurance and implementation remain and will be addressed in subsequent sections.

2.3. Investment Policy Orientation

Unlike the BRI, which primarily relies on public bilateral loans from Chinese state-owned banks such as the China Development Bank and engages with multilateral institutions like the Asian Infrastructure Investment Bank (AIIB), the China Development Bank (CDB), and the Export-Import Bank of China (EXIM China) for infrastructure development in low- to middle-income countries, PGII focuses on attracting private sector investment through blended finance approaches, leveraging various development finance tools. These include the U.S. International Development Finance Corporation (DFC), U.S. Agency for International Development (USAID), the Export-Import Bank of the United States (EXIM U.S.), the Millennium Challenge Corporation (MCC), and the US Trade and Development Agency (USTDA). Similarly, GG aims to crowd in private sector investments by leveraging EU financial frameworks such as the Instrument for Development and International Cooperation (NDICI) and the European Fund for Sustainable Development (EFSD+). This strategy is complemented by investment programmes like the Instrument for Pre-Accession Assistance (IPA) III, Interreg, InvestEU, and Horizon Europe, employing a mix of grants, soft loans, and guarantees. The European Commission uses the public–private partnership (PPP) model to merge public funds designated for development aid with private investments to finance infrastructure projects under the GG strategy, aiming to create a synergy where public investment attracts private capital, thereby expanding the financial base for large-scale infrastructure projects that might otherwise be too costly or risky for private entities to undertake alone (Mutlu, 2023; Heldt, 2023; Tagliapietra, 2023; Simonov, 2025).

Although estimates of BRI spending vary widely, conservative figures provided by institutions such as the American Enterprise Institute (AEI), William & Mary TradeAid, and UNCTAD estimate BRI funding at approximately USD 272 billion between 2014 and 2017, USD 354.4 billion between 2000 and 2014, and USD 448 billion between 2014 and 2018. When compared to GG's funding of around USD 413 billion (EUR 350 billion) between 2014 and 2018, the BRI and GG may seem comparable in terms of funding size. However, since grants tend to provide more long-term social benefits than loans because they do not require repayment, which lessens the financial burden on recipient countries, GG may have a more positive impact on infrastructural development compared to the BRI (USITC, 2021; Tagliapietra, 2023).

In 2015, PQI allocated USD 110 billion worth of "quality infrastructure investment" in Asia over the next 5 years, which was increased to USD 200 billion in 2016 (Gaens & Sinkkonen, 2023). PQI is similar to the BRI in two ways. First, both initiatives primarily rely on official development assistance (ODA) loans for infrastructure financing in contrast to the blended finance models of PGII and GG and the investment fund-driven approach of 3SI. Second, a significant portion of the ODA loans under both the BRI and PQI has historically been tied to the procurement of domestic inputs, thereby supporting the exporting of a country's own industries—China's and Japan's, respectively. PQI leverages public funding from the Japan Bank for International Cooperation (JBIC) and the Japan Overseas Infrastructure Investment (JOIN). However, unlike the BRI, PQI also explicitly promotes PPPs, aiming to mobilise private capital alongside public funds by utilising the Japan International Cooperation Agency's (JICA)'s Private Sector Investment Finance (PSIF) tool to enhance project quality and sustainability (Grieger, 2021; Gaens & Sinkkonen, 2023).

Similarly, the Three Seas Investment Fund (3SIIF), under the 3SI initiative, seeks to foster a diverse, fiscally responsible, and environmentally sustainable investment portfolio. This portfolio aims to attract private investors and international financial institutions to bridge the infrastructure gap between the Three Seas region and Western Europe. The focus areas include energy, transportation, and digital infrastructure, specifically enhancing North–South connectivity. Each eligible infrastructure project, whether a new development

(greenfield) or expansion of existing facilities (brownfield), is expected to be construction-ready and deliver substantial benefits to at least two regional states. Managed on a fully commercial basis, the fund operates with a transparent investment process independent of its shareholders and anticipates a high internal rate of return between 12 and 15%, reflecting the Three Seas region's unique position at the intersection of emerging market dynamism and developed market stability. The U.S. has shown interest in supporting the fund through the DFC, pledging to contribute no less than 30% of the total commitments from the 3SI states. The initial investment has a potential multiplier effect by being positioned to complement EU or national funds, draw additional equity investments, and stimulate lending by financial institutions. Ultimately, the goal is for direct public funding to constitute only 30–40% of infrastructural investment, with the majority sourced from private investors and commercially operated state-owned enterprises (Wilczek & Rudowski, 2024).

Therefore, private sector equity is instrumental to the funding of public infrastructure projects under PGII, GG, FOIP/PQI and 3SI. Public financing infused with private financing through shared partnership may be considered advantageous over purely public financing because private providers have stronger incentives to ensure quality by taking responsibility for both the construction and maintenance of infrastructure projects, sharing risks, and improving efficiency and innovation (Engel et al., 2020). This model contrasts with the BRI, which is more reliant on public financing and may not have the same level of quality incentives. Empirical evidence indicates that in Asia, highly indebted countries exhibit a positive and significant medium-term private investment multiplier. This outcome is supported by several region-specific factors that bolster investor confidence: the adoption of counter-cyclical fiscal policies to sustain macroeconomic stability, the continued prioritisation of infrastructure investments, export-oriented development strategies with integration into global value chains, and access to regional financial safety nets. Additionally, structural reforms and liberalisation efforts, economic diversification across emerging sectors, and growing emphasis on high-tech industries create a conducive environment for enhancing returns on private capital, even under conditions of elevated public debt (Jalles et al., 2024).

Ideally, the relationships between participating countries and the leading states of global or regional infrastructure initiatives should not be zero-sum. Engagement with one initiative should not preclude mutually beneficial cooperation with others, nor should it result in disproportionate dependency or trade asymmetries (Zhao, 2021). However, under the BRI's '17 + 1' mechanism in Central and Eastern Europe, concerns have emerged over worsening trade imbalances and declining foreign currency reserves. For instance, the EU's trade deficit with China peaked at EUR 397 billion in 2022 before decreasing to EUR 291 billion in 2023[3] marking the first significant reduction in a decade. This reflects China's shift towards domestic consumption and reduced foreign imports under its "dual circulation" model. In response to these structural asymmetries, initiatives like 3SI aim to diversify investment sources and reduce dependence on Chinese financing (Wroblewski & Spinck, 2023). A notable example of dissatisfaction with BRI outcomes is Italy's withdrawal from the BRI in 2023, driven by persistent trade imbalances—Italy's exports to China lagged significantly behind its imports, especially relative to non-BRI European economies (Simonov, 2025).

Despite its high foreign liabilities, China's foreign currency reserves amounted to USD 3.32 trillion[4] in 2024 Q3, exceeding the combined reserves of all G7 countries. In comparison, during the same period, the U.S. held about USD 0.04 trillion[5], Japan USD 1.25 trillion[6], Germany USD 0.38 trillion[7], France and Italy USD 0.29 trillion each[8], the U.K. USD 0.19 trillion[9] and Canada USD 0.13 trillion[10]. There is, however, a risk that China's high trade surplus and foreign exchange reserves could diminish if trade tensions with the

U.S. intensify. These reserves are essential for stabilising the yuan, not only by enabling the central bank to buy back the currency when it depreciates but also financing international initiatives like the BRI, which often require foreign currency outflows. A decline in reserves would constrain China's capacity to support BRI projects directly through reduced capital availability and indirectly by weakening national income from net exports. This, in turn, could trigger higher imported inflation, deepen yuan depreciation, and potentially fuel capital flight, further eroding investor confidence (Matsumura, 2019).

The effectiveness of private investment depends not only on market incentives but also on institutional quality and public oversight. In weak institutional settings, highly motivated private firms working alongside poorly monitored public officials can lead to inefficiencies or the misuse of funds, as seen in some PPPs in developing countries. While cost-cutting can improve efficiency, it may also reduce service quality if not properly regulated. To ensure positive welfare outcomes, infrastructure quality should be observable and tied to contractor performance. Where public engineering capacity is strong, greater public sector management may be more appropriate (Glaeser & Poterba, 2020).

Therefore, although the alternative initiatives aim to address the capital flight, market instability, and debt risks associated with the BRI, there is still a risk that they may not attract sufficient private sector investment to fund large-scale infrastructure projects. The private sector consists of profit-maximising business entities that prioritise asset security over the fulfilment of development objectives. In this regard, private investors may tend to be highly selective, favouring lower-risk infrastructure projects that promise good returns on investment but having short investment cycles (Rana, 2021). Consequently, economic infrastructure such as roads, railways, satellite communications, and clean/renewable energy technologies could be more likely to be prioritised over social infrastructure projects like hospitals and universities, which have a lower likelihood of recovering capital costs but provide significant positive externalities to society. In contrast, Chinese companies are observed to be less risk adverse in committing capital to infrastructure projects in countries with volatile economic, regulatory and political environments such as in the Middle East due to China's strategic interests and generous state backing for state-owned investment and construction companies (Siddiqa & Abbas, 2022; Schacht, 2024).

Under the modern PPP model in emerging Asian economies, private firms are responsible for the entire lifecycle of infrastructure projects, including maintaining existing assets and financing subsequent phases of investment, with the government playing a more limited role in providing loans and guarantees. While PQI emphasises sustainability and quality infrastructure, this model may still entail significant financial and operational risks for private firms, unless it is supported by ample risk management policies from the public sector (Katada, 2020). The requirement for private investors to finance and manage investments exposes them to adverse global macroeconomic conditions, such as unanticipated currency depreciation and GDP growth volatility, resulting in a risk of market failure and declining investor demand for infrastructure projects. To date, the limited success of 3SIIF in attracting investment from private investors, international financial institutions, and the U.S. may reflect either a flawed perception of the region's investment potential, overly strict funding criteria, or both. In four years, the fund has made only five investments (Wilczek & Rudowski, 2024).

The Asia–Africa Growth Corridor (AAGC) is a key element of FOIP, considering the development prospects of Africa and in counterbalancing the BRI's significant influence in the region. Similarly, Africa is the key regional priority of GG, with a target investment deployment of EUR 150 billion (Tagliapietra, 2023). Since some African nations are already encumbered by debt due to BRI[11], adding to their debt via ODA loans for infrastructure development would conflict with FOIP's principle of debt sustainability. Exacerbated

by Japanese companies' risk aversion of investing in unstable territories, Japan pledged USD 20 billion of ODA loans and investments in 2019 to Africa, which was only a third of China's in the previous year (Grissler & Vargö, 2021).

The persistent failure of G7 countries to meet the 0.7% ODA benchmark (except for Germany) underscores the fiscal and political challenges of traditional development financing. Although PGII's model of mobilising private investment through blended finance and public guarantees offers a promising alternative, its success will still depend on whether G7 governments are prepared to make credible long-term commitments to backstop private risk—a requirement that is functionally similar to meeting ODA obligations in spirit, if not in structure. Moreover, given that G7 countries' infrastructure is barely sufficient to support their economic needs or public services, it may be difficult to justify to their taxpayers as to why billions of dollars should be spent on infrastructure projects in developing countries, rather than addressing their own domestic infrastructure needs. In contrast, China had invested USD 755 billion in the BRI, which has more than 140 participating countries to date, in about eight years since its inception (Shah et al., 2022).

In sum, the landscape of infrastructure financing reflects a fundamental divergence between the BRI's predominantly state-led, loan-based model and the blended finance strategies of its Western and allied counterparts—PGII, GG, FOIP/PQI, and 3SI—which prioritise mobilising private sector capital through public guarantees, grants, and institutional frameworks. While private investment can lead to more socially optimal outcomes by driving efficiency, innovation, and long-term fiscal sustainability, it is also highly sensitive to political, financial, and market risks, limiting its scope in less stable developing contexts. Conversely, China's strategic use of sovereign-backed loans allows BRI projects to advance in riskier environments but raises concerns over debt sustainability, transparency, and asymmetric trade relations. Despite China's superior foreign currency reserves, which could enable sustained BRI financing, intensifying trade tensions with the U.S. and an increasingly adverse geopolitical climate could weaken the yuan and erode these reserves. This, in turn, would constrain China's ability to finance overseas infrastructure projects, particularly those requiring foreign currency outflows. A prudent balance between public and private financing models may offer a more resilient and adaptable approach to global and regional infrastructure development—one that alternative initiatives might be better positioned to deliver in theory (due to their design and intentions) than the predominantly state-driven BRI.

2.4. Trade Policy Orientation

PGII, GG, FOIP/PQI and 3SI operate primarily at the multilateral level, engaging with multiple countries or regions through frameworks based on cooperation, shared standards, and institutional coordination. In contrast, the BRI is largely bilateral in implementation, despite being multilateral in scope.

In bilateral trade agreements, non-member countries are often placed at a disadvantage due to the exclusive nature of tariff preferences granted only to the two signatory countries. For instance, if Country A and Country B sign a bilateral agreement reducing tariffs for each other's goods, a third country (Country C) exporting similar products to either A or B continues to face the higher non-discriminatory tariff. This discriminatory treatment distorts trade by diverting imports away from more efficient producers like Country C, solely because they are not party to the agreement. Such trade diversion effects are common in bilateral settings, where access to preferential markets is restricted. In contrast, multilateral agreements, such as those governed by the World Trade Organization (WTO), are in principle non-discriminatory under Article I of the General Agreement for Tariffs and Trade (GATT): tariff concessions granted to one WTO member must be extended to

all other WTO members. As a result, trade among WTO members is conducted on a more neutral, efficiency-enhancing basis.

This distinction has important implications for infrastructure and connectivity initiatives. Multilateral approaches—such as those supported by PGII, GG, FOIP/PQI, and 3SI—may foster long-term liberalisation benefits, even for non-member countries. By contrast, infrastructure development agreements rooted in bilateralism—such as many under the BRI—may lead to fragmented outcomes and unequal access to trade and investment flows. Ultimately, national incentives to support multilateral versus bilateral frameworks depend on each country's factor endowments and political economy trade-offs, including the distribution of producer surplus, consumer surplus, and tariff revenues (Saggi & Yildiz, 2010).

While both bilateral and multilateral initiatives are susceptible to governance failures, the risks of socially inefficient or politically motivated infrastructure projects are often more pronounced under bilateral arrangements. This is due to weaker accountability mechanisms, limited competitive pressure, and asymmetric donor–recipient dynamics that can skew project selection away from local or regional priorities. For instance, the long-term fiscal sustainability of Chinese investments in Croatian shipyards has been questioned and the BRI's Belgrade–Budapest railway project, while enhancing trade between China and central–northern Europe and southern European ports, does not necessarily contribute to the region's internal connectivity or north–south routes (Dziewiałtowski-Gintowt, 2019).

2.5. Inclusivity and Regional Integration

It has been argued that the BRI tends to exclude domestic contractors from participating in infrastructure projects, with 89% being Chinese companies, while the U.S., European and Japanese counter-initiatives are allowed for more consideration towards the needs of and benefits to the local economy (Grissler & Vargö, 2021). One example concerns the Gwadar port of Pakistan, which is the key structural link of the China–Pakistan Economic Corridor under the BRI. The construction of the Gwadar Eastbay Expressway had a negative impact on the economic well-being of fishermen by restricting their access to the sea, and such developmental decisions were made without adequate local consultation and impact assessments (Shah et al., 2022). Another example concerns the Muse–Mandalay Railroad project in Myanmar, whereby the "consultation process" was generally one-sided (just the presentation of the economic benefits) and only with community representatives rather with than the local communities directly affected by the construction of the railroad (Mark et al., 2020). Such dynamics are not unique to Pakistan and Myanmar and might be observed in other developing countries participating in the BRI due to the favouring of larger economic players who possess strong informal networks with political elites or Chinese investment partners. This poses barriers to local firms without such connections and have no ethically Chinese representatives, exacerbated by limited capital and technical expertise. Thus, the opaque decision-making and limited community engagement of BRI projects may foster NIMBY syndrome rooted in the perceived erosion of local ownership and economic benefit.

Initiatives such as PGII/BDN, GG, FOIP/PQI, and 3SI emphasise integration through a rational-legal perspective, establishing a rule-based order to promote organisational and institutional efficiency. These frameworks encourage participating countries to align with established norms and engage in broad cooperation (Nagy, 2021). This emphasis is grounded in the understanding that promoting quality infrastructure depends heavily on regulatory harmonisation and standardisation. Coordinating across sectors, borders, and jurisdictions requires predictable institutional frameworks that support long-term governance and sustainability goals. Such alignment enables the integration of diverse regional policies into cohesive infrastructure systems, particularly in sectors like energy,

water, and transport, and provides the stability needed for innovations such as green technologies to thrive (Blind, 2024). In contrast, the BRI often relies on non-binding memorandums of understanding (MoUs) focused on maintaining sovereignty and process-oriented cooperation toward specific goals, which, in theory at least, allows for some flexibility in adapting to the domestic priorities of host countries (Nagy, 2021). This draws parallels with the BRI's strong emphasis on cooperation as mentioned in Section 2.1, suggesting a discrepancy between actual implementation and participatory ideals regarding BRI projects.

It can be argued that some of these alternative initiatives may provoke a different kind of NIMBY syndrome, i.e., resistance towards normative expectations such as environmental conditionality, anti-corruption benchmarks, or human rights clauses, which may be perceived by recipients as externally imposed and misaligned with local developmental priorities or institutional capacities. For example, unlike the BRI, which does not impose the requirement of participating countries to adopt liberal democratic norms, the cooperation mechanism for the diffusion of EU's connectivity policies' norms under GG appears to be "coercive" and "non-reflexive" in nature, based on an analysis of EU communications and official documents on this issue. Communications of GG's principles and values to beneficiaries are structured unilaterally, emphasising adherence and conformity. There is a noticeable lack of discussion on the degree to which participating countries are expected to absorb these norms, a shared understanding on what construes fair and sustainable among domestic stakeholders, and how a misalignment of preferences on project terms will be addressed. This suggests that participating countries are limited to a binary choice: to either accept or decline cooperation in EU connectivity projects in the interest of high-quality assurance of the infrastructure to be delivered (Karjalainen, 2023). This highlights an important irony in that both the BRI and GG could face similar criticisms about inclusivity, albeit for different reasons: the BRI for not fulfilling promises of local engagement and GG for enforcing strict compliance to regional standards without enough flexibility to adapt to local contexts.

While China was the ASEAN's largest external trading partner in 2015, lower tariffs under the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), alongside concerns over China's lending practices and South China Sea disputes, have allowed the valuation of Japan's infrastructure projects in ASEAN's six largest economies to surpass China's by USD 112 billion in 2019. This shift aligns with the FOIP strategy, leveraging the ASEAN's strategic role in connecting the Indian and Pacific Oceans (Grissler & Vargö, 2021). However, although ASEAN countries are generally supportive of FOIP's proposed connectivity and economic development policies, the compromise of ASEAN centrality and unity is a concern, i.e., the ASEAN is not playing a central role in the FOIP strategy unlike in the Asia–Pacific, and the necessity of adopting shared values may put some ASEAN countries off from participating. In addition, given that most ASEAN countries are already actively participating in BRI projects, the decoupling of U.S.–China security confrontation from sustainable economic development is preferred (Tomotaka, 2021). Not all EU's values are also welcomed by ASEAN countries, meaning that GG faces the same type of resistance as FOIP (Garcia & Masselot, 2015). Transitionary allowances are also essential to ensure that the trade-off between economic/energy security and the adoption of green energy or other sustainable development goals is not compromised. Some developing countries may be unable to adhere to the strict principles and standards set out by the other infrastructure initiatives with regard to human rights, environmental sustainability, legislation and anti-corruption frameworks, thus being excluded from participating in them. For example, with regard to environmental protection, the funding of coal-fired power plants is phased out under PGII. However, the BRI provides transitory

funding allowances for abated and more efficient coal-fired power plants, which would be more practical for developing countries such as Indonesia and Vietnam where there are significant concerns about the increase in electricity prices and potential power shortages with regard to the phasing out of coal power (Siddiqa & Abbas, 2022; Do & Burke, 2024).

Another challenge of high-quality infrastructure investments is that they demand robust and transparent governance, which often entails lengthy administrative processes and potential reductions in state sovereignty for participating countries. Developing nations may struggle with these complex bureaucratic requirements, hindering their ability to mobilise investments swiftly. In Africa, infrastructure projects are frequently tied to election campaigns, suggesting a mismatch between local time preferences and the extended screening processes necessary for mobilising investments, unlike the faster-paced BRI. Moreover, while the transition to green energy is perceived to be a necessity according to EU norms in the GG strategy, it may be perceived as secondary to the pressing need for basic infrastructure by developing countries, leading to resistance against mandates for minimum green investments. Afrobarometer's national surveys, conducted across 34 African countries between 2019 and 2021, indicate that slightly more than half of the respondents favour greater local control over the use of external development funds and the management of human rights and socio-political issues within their countries (Heldt, 2023). Moreover, the BRI's Digital Silk Road has given China a first-mover advantage in setting standards within the digital economy, such as in 5G, the IoT, and smart city development (He, 2022). This established influence could make it challenging for new initiatives to persuade countries to adopt alternative standards before proving their resilience and value.

In sum, inclusivity remains a contested notion across both the BRI and its Western and allied counterparts. In the case of the BRI, while it is rhetorically framed as an open and cooperative initiative, limited local consultation in practice, the dominance of Chinese firms in infrastructure projects and insufficient environmental or social impact assessments have led to tensions over project legitimacy. However, the BRI's appeal also stems from its relatively flexible terms—fewer policy conditions, faster disbursement, and limited requirements to conform to international standards. This low-conditionality approach can be seen as a form of inclusiveness, particularly for countries that struggle to meet the strict environmental, governance, and human rights criteria imposed by other initiatives. Conversely, initiatives such as PGII/BDN, GG, FOIP/PQI, and 3SI promote inclusiveness through transparent procurement, sustainability standards, and fair access under multilateral or regional frameworks. These features aim to reduce corruption, encourage stakeholder participation, promote green energy and ensure benefits are more evenly distributed. Yet, from the perspective of developing countries, the need to conform to predefined norms and standards may be perceived as intrusive or sovereignty-limiting. Thus, despite their intentions, these initiatives may inadvertently exclude some countries that lack the institutional capacity to comply with such frameworks and hinder the mobilisation of critical infrastructure investments.

2.6. Coordination Mechanisms

While all four initiatives share a commitment to rule-based governance, their degree of institutionalisation varies, with GG embedded in EU institutions, FOIP/PQI largely Japan-led, PGII coordinated among G7 states, and 3SI coordinated among the relevant EU member states. Unlike the BRI, which is centrally coordinated by China, involving multiple actors can lead to challenges in aligning policy objectives. This may result in more diversified but less targeted infrastructure investments in developing countries. Although the broad objectives of PGII, FOIP/PQI and GG are well-established, specific details on funding sources, coordinating mechanisms, capital allocation, cross-border contractual

obligations, and project timelines remain relatively less concrete and cohesive compared to the BRI, even though the latter has also been criticised for the opacity and viability of its operational strategy and implementation guidelines (Shah et al., 2022; Siddiqa & Abbas, 2022; Matsumura, 2019; Tagliapietra, 2023). Diplomatic principles at the strategic level do not always align with the actual implementation of infrastructure projects on the ground. Essentially, the misalignment between the soft power approach (e.g., promoting transformative ambitions through BDN certification) and hard power capacity (e.g., the BDN's actual ability to influence or change investment decisions) suggests that the market risks may remain unmitigated, and firms may not see guaranteed profits despite the emphasis on transparency and sustainability (Ashbee, 2021). These uncertainties might lead developing countries, which prioritise meeting their infrastructure needs over potential debt repayment challenges, to favour the BRI's financing approach. The BRI's straightforward loan structure from Chinese banks, which could be less expensive than market financing with fewer strings attached, offers a clearer and more immediate understanding of the financial terms involved (Heldt, 2023; Gelpern et al., 2022; Shah et al., 2022).

Regarding PGII, trade relations between G7 countries and China are not uniform. For instance, the U.S. is engaged in a trade war with China, while Japan maintains a relatively less confrontational bilateral relationship. While PGII and FOIP emphasise democratic values and high-quality, sustainable projects at their core, they are more reactionary to China's growing influence through the BRI compared to GG. Given the U.S.'s critical stance toward China, this introduces challenges in reaching consensus among member states on PGII's and FOIP's investment-led infrastructure policies, which may serve as competitors or complements to the BRI (Shah et al., 2022). While the U.S. plays a central role in FOIP, especially in safeguarding geoeconomic security in the Indo-Pacific region, the Trump administration appeared to distance itself from leading the economic and infrastructure components of FOIP by failing to implement adequate institutional and funding commitments, leaving Japan to shoulder much of the financial responsibility for implementing digital technology, infrastructure, and energy projects to counter the BRI. Moreover, U.S.–Japan relations were strained by the U.S.'s withdrawal from the TPP in 2017 and demands from the U.S. to reduce Japan's trade surplus (Matsumura, 2019). Moreover, there is disagreement among G7 and EU member states about which regions—Sub-Saharan Africa, South/Latin America and the Caribbean, or the Western Balkans—should be prioritised for infrastructure investment (Siddiqa & Abbas, 2022; Heldt, 2023).

Bottlenecks may also occur in policy implementation, since multilateral cooperation may imply lower efficiency and more bureaucracy despite enhancing legitimacy and inclusiveness. For example, after its initial launch in 2019, the BDN did not see significant progress or activity for a period of time until the OECD took a more active role in 2021, which revitalised the initiative (Grieger, 2021). Moreover, it has been reported that the BDN was officially "launched" again and its global certification process formally initiated during the OECD Infrastructure Forum in 2024[12]. Despite ambitious targets, 3SIIF's current total commitments equate to only EUR 928 million, which is below the initial EUR 3–5 billion goal as of mid-2024. The call to increase the current level of commitments to the fund has been met with a lukewarm response from 3SI member states, with Czechia and Slovakia not establishing any formal commitment. Moreover, Poland has an unduly influence on the fund, which undermines the concept of regional cooperation (Wilczek & Rudowski, 2024).

Heterogeneity among 3SI members has historically complicated the goal of economic integration due to diverse monetary systems and economic conditions. As of 2019, only six 3SI members—Austria, Estonia, Latvia, Lithuania, Slovakia, and Slovenia—had adopted the Euro, while others, such as Poland and Croatia, still used domestic currencies. At that time, three members—Bulgaria, Croatia, and Romania—remained outside the Schengen

area, meaning internal border controls continued to restrict seamless trade and movement[13] (Dziewiałtowski-Gintowt, 2019). In comparison, however, BRI countries are even more diverse and lack a unified, rule-based framework, making 3SI participation more institutionally coherent and potentially more advantageous for Central and Eastern Europe.

2.7. Environmental Sustainability

Infrastructure projects that fail to align with the environmental expectations of local communities may also be classified as NIMBY facilities, particularly when adverse pollution is concentrated in specific areas that the physical infrastructure is being constructed in. NIMBY facilities may not only be limited in scope in terms of zoning and siting decisions since, regionally, economic corridors can lead to increased greenhouse gas emissions not only from infrastructure development but also from transportation and industrial production processes. Although direct evidence on local environmental preferences is limited, differences in environmental outcomes between BRI and non-BRI member countries offer an indirect lens to assess such concerns. Empirical studies examining changes in pollution levels, carbon intensity, and the deployment of green technologies provide insight into the extent to which BRI projects have been perceived as environmentally unsustainable or otherwise.

Several studies have shown that BRI member countries fare worse in environmental sustainability compared to non-member countries, and this negative effect is more pronounced for developing countries than developed countries. For example, Elish and Aboelsoud (2024) found a significant increase in ecological footprint consumption (EFP) (as measured by the Global Footprint Network) among BRI member countries, especially African countries, after the implementation of the BRI in 2014, and this is linked to an increase in financial development, implying the lack of sustainable and green finance to ensure that industries adopt cleaner technologies as they grow (Ahmad et al., 2020; Baloch et al., 2019). Although the BRI was found to have improved its member countries' environmental quality in terms of exporting new green technology and augmenting environmental regulation (indirectly proxied by external health expenditures), the industrial structure effect remained unchanged, i.e., industries were still predominantly using fossil fuels. Moreover, the resource utilisation stage was still the main driver for expanding the scale of economy rather than the production efficiency stage, meaning that scale effects would continue to result in more environmental pollution (Cao et al., 2021). Countries along the Maritime Silk Road were assessed to fare poorly in wastewater treatment and water use efficiency, the development and deployment of renewable energy sources, the coverage of marine protected areas, support for marine science research, and the preservation of ecosystem services and genetic resources (Chen et al., 2023).

The pollution haven theory is validated by Ali and Wang (2023), who found that upstream countries in global value chains (GVCs) are likely to relocate their polluting industries to the lower stream of GVCs, where most BRI economies are located. Moreover, improvement in environmental quality is only evident for developed economies as they are able to leverage their more energy-efficient and less carbon-intensive production technology in assemblages during the final stage of production, producing cleaner intermediate inputs relative to their imported counterparts, i.e., a pollution halo effect. In contrast, environmental quality deteriorates for emerging and developing BRI economies.

However, other studies suggest that the BRI has contributed to improving environmental quality in participating countries, particularly in developing regions. In Africa, the BRI participation of developing countries has been linked to substantial reductions in the carbon intensity of energy-intensive sectors compared to both developed and non-participating countries (Dusengemungu et al., 2023). The disparity in impact between

developed and developing countries may arise from the fact that developed nations are less likely to participate in the BRI, potentially missing out on the additional green benefits it offers through increased technical efficiency in industrial structures and technological innovation in the harnessing of renewable energy. Moreover, developing nations often start with lower baselines in terms of green energy infrastructure and tend to have higher levels of energy consumption and pollution. As a result, the potential for significant environmental improvements in developing countries may be greater, leading to more pronounced returns to scale in terms of environmental quality improvements compared to developed nations. An analysis of 65 BRI countries revealed a 34.5% reduction in energy consumption and a 36.4% decrease in carbon emissions, attributed to technology transfer regarding the reduction in fossil fuel usage and the optimisation of energy structures (Jiang et al., 2021).

Moreover, the BRI has significantly promoted the intra-industry trade of Environmental Goods (EGs), especially in renewable energy technologies and pollution-monitoring apparatus. The environmental benefits of the BRI were particularly pronounced for developing participants—greater for vertical intra-industry trade (products with similar attributes but different qualities) than horizontal intra-industry trade (products with different attributes but similar qualities) (Zhou et al., 2024). Based on two counterfactual scenarios, Yan et al. (2024) found that shifting production from local producers to Chinese multinational enterprises could abate 29.06 million tonnes of carbon emissions, and by relocating production to countries with cleaner energy structures rather than importing from China, global emissions could be reduced by 165 million tonnes.

Although the construction of six major economic corridors improves trade facilitation by shortening trade time and reducing trade costs, which in turn promotes economic growth in BRI member countries, a higher level of emissions may ensue. However, Xiang et al. (2024) found that the magnitude and direction of the environmental effect vary substantially across economic corridors. For example, although five of the economic corridors are associated with an increase in total greenhouse emissions, with the China–Indochina Peninsula Economic Corridor (CICPEC) having the largest increase and the New Eurasian Land Bridge (ELB) having the smallest increase, the China–Pakistan Economic Corridor (CPEC) is associated with a decrease in total greenhouse emissions. Emission elasticity, i.e., the percentage change in emissions resulting from a 1% increase in GDP, is greater than 1 for CO_2 and N_2O within the China–Mongolia–Russia Economic Corridor (CMREC), CICPEC, and the China–Central Asia–West Asia Economic Corridor (CCWAEC), indicating that emissions in these regions are rising faster than economic output. However, in most BRI member countries, the rate of economic growth exceeds the rate of emissions growth, i.e., emission elasticity is less than 1. Moreover, four countries that are located in the ELB—primarily developed economies—have managed to achieve both an increase in GDP and a reduction in emissions under trade facilitation. Although the decoupling of absolute emissions from economic growth remains limited to developed countries, BRI trade facilitation generally leads to improved emission intensity (emissions produced per unit of GDP) across most member countries, which constitutes a notable environmental achievement.

In sum, while some BRI projects have triggered NIMBY-type resistance due to environmental degradation or insufficient consultation, evidence also shows that BRI participation has, in certain contexts, contributed to measurable environmental improvements —particularly in developing countries through the deployment of green infrastructure under the Green Silk Road. This suggests that environmental NIMBYism related to the BRI may be context-dependent and potentially mitigated by green investment offsets. By contrast, alternative initiatives from the West, Europe, and the Indo-Pacific, despite their stronger environmental governance standards, have yet to demonstrate equivalent environmental gains at scale. As Hussain et al. (2021) note, institutional factors such as political

stability, the rule of law, and corruption control are critical for enhancing renewable energy investment. Trade openness can also mitigate the adverse effects of weak governance. A potential comparative advantage for these emerging initiatives, therefore, lies not only in enforcing high environmental standards, but in helping partner countries move from reducing emission intensity to achieving absolute emission reductions. This would require targeted reforms to improve environmental governance and reshape consumption and production structures in developing economies.

3. Measuring the Value of Quality Soft Infrastructure Elements

The demand for hard infrastructure—such as expressways, ports, and power grids—is relatively straightforward to estimate since it directly supports societal and economic functions. In contrast, the benefits of soft infrastructure are less tangible but likewise essential in driving economic activity, fostering innovation, and enhancing well-being, as outlined in Section 2.1. See Table 2 for detailed highlights of the comparison between the infrastructure initiatives.

Table 2. Detailed comparison between global and regional infrastructure initiatives.

Infrastructure Initiative	BRI	PGII	GG	FOIP and PQI	3SI
Regional focus	Global (with strongest operational concentration in Asia, Africa, and increasingly Latin America)	Global (with explicit strategic orientation toward the Global South, i.e., Africa, Latin America, Asia, Oceania)	Africa (greatest priority), Latin America and the Caribbean, Western Balkans, Asia, Oceania	Indo-Pacific: spanning the eastern coast of Africa, Indian Ocean, and Pacific Ocean rim, connecting Asia (greatest priority) and Africa	Central–Eastern Europe: Baltic, Adriatic, and Black Seas
Key objectives	- Infrastructure construction and connectivity - Trade facilitation and regional economic integration - Energy security and resource access - Digital connectivity (Digital Silk Road) - Health cooperation (Health Silk Road) - Environmental cooperation (Green Silk Road) - Scientific collaboration (Space/Polar Silk Roads)	- Infrastructure construction and sustainable connectivity - Climate resilience and green energy transition - Health security - Gender equality and equity - Digitalisation - Domestic job creation and social expenditure - Supply chain resilience	- Infrastructure and sustainable connectivity - Climate resilience and green energy transition - Health and food security - Transport - Education and research - Digitalisation - Supply chain resilience	FOIP: - Rule of law and freedom of navigation - Maritime security and regional peace - Economic prosperity via regional connectivity - Promotion of free trade and open supply chains PQI: infrastructure construction and connectivity (transportation, water management, energy)	- Improving infrastructure competitiveness from cross-border and macro-regional connectivity, commerciality, and complementarity across energy, transport, and digital sectors in Central and Eastern Europe - Enhancing energy security and diversification (e.g., LNG corridors)
Key features	"Standard" and hard infrastructure; emphasises openness, inclusiveness, and fair trade in official rhetoric; however, project-level implementation has raised concerns about transparency, competitive procurement, and debt sustainability in practice	"Quality" and soft infrastructure alongside hard infrastructure; prioritise fairness, good governance, transparency and accountability; promote open competition; life-cycle cost considerations and debt sustainability, including strong emphasis on environmental and social safeguards and normative conditionality; facilitate free trade and regional integration by building regulatory environments and institutional capacity			Hard infrastructure; aims to garner political support, improve intra-EU regional cohesion, and strengthen transatlantic ties through regionally strategic infrastructure projects

Table 2. *Cont.*

Infrastructure Initiative	BRI	PGII	GG	FOIP and PQI	3SI
Investment policy	Primarily funded by Chinese state-owned banks; includes multilateral institutions like the AIIB, CDB, and EXIM China; a notable portion of loans are tied to the procurement of domestic inputs	Uses blended finance to mobilise private sector investments through various development finance tools, e.g., DFC, USAID, EXIM U.S., MCC, and USTDA	Combines EU public grants, soft ODA loans, and guarantees with private investments; mobilised through instruments, e.g., NDICI, EFSD+, IPA III, Interreg, InvestEU, and Horizon Europe	Relies mainly on soft ODA loans via institutions like JBIC and JOIN; a notable portion of loans is tied to the procurement of domestic inputs; promotes PPPs via tools like JICA's PSIF	Supported by member state contributions to the 3SIIF via national development banks, as well as EU public funds and private sector investments
Trade policy	Mainly bilateral engagements; process-oriented, non-binding MoUs and sovereignty-centric perspective that includes cooperation on specific goals	Primarily multilateral engagements; rule-based order, rational-legal perspective to promote organisational and institutional efficiency that includes broad cooperation			
Inclusivity	Debatable as developing countries such as Pakistan and Myanmar have complained about the lack of local engagement in infrastructure projects, contrary to BRI rhetorics; however, having fewer conditions attached to loans and investments, and not having to adhere to regional standards and principles, could be perceived as inclusive	Debatable as although a fair, transparent and standardised system of international trade and investment rules can foster inclusiveness of economies, participating countries may feel that their sovereignty is compromised by having to accept the diffusion of these norms, regulations and standards			Inclusive but largely internal to the EU as the central goal is to eliminate development differences between 3SI-12 (new EU states) and non-3SI-12 countries (older, more developed EU states)
Coordination	Multilevel principal coordination mechanism with more than 140 participating countries to date, but might be offset by institutional heterogeneity across these countries	Despite the presence of institutional frameworks, actual coordination remains fragmented due to the lack of a principal coordination mechanism, different geopolitical interests, trade relationships with China, and internal disagreements over geographic and policy priorities			
Economic and geopolitical stance	To foster economic interdependence and expand China's geopolitical influence through infrastructure financing, connectivity, and soft power diplomacy	Framed as a direct strategic countermeasure to BRI to promote a transparent, high-quality alternative to Chinese infrastructure financing	Primarily an EU-driven strategy for projecting normative influence; framed as an indirect countermeasure to BRI	Partially direct counter to BRI—less explicitly confrontational than PGII, but shares strategic goals	Primarily a regional infrastructure initiative but has increasingly been framed as a soft counterbalance to China's growing influence in Central and Eastern Europe

Since private investment plays a central role in financing non-BRI infrastructure initiatives (Section 2.3), their success depends heavily on the ability to attract capital aligned with sustainable development goals, including improvements in transparency (Section 2.2) and environmental sustainability (Section 2.7). Moreover, the diffusion of international norms and standards may require host countries to accept certain limitations on policy autonomy or regulatory sovereignty (Section 2.5). While such trade-offs are rarely quantified in traditional cost–benefit analysis (CBA), they can meaningfully affect public acceptance and long-term outcomes. Therefore, capturing these intangible preferences, particularly when evaluating initiatives like GG that explicitly promote norm-diffusing connectivity, can help estimate the full social value of infrastructure investments. We

briefly illustrate the economic theory of willingness to pay (WTP) and willingness to accept (WTA) behind the use of stated choice experiments to estimate demand for specific aspects of soft infrastructure such as certified and transparent sustainable investment products (Section 3.1), as well as adopting international norms and standards (Section 3.2).

While WTP is the highest amount that the individual is willing to give to obtain a chosen good, WTA is a mirror opposite of the least amount of compensation that individual requires to give a chosen good or accept harm (Boardman et al., 2018). For example, in the case of air pollution, WTP is the maximum amount an individual would be willing to pay to obtain clean air while WTA would be the minimum compensation an individual would require to forego clean air and accept polluted air. When properly estimated, WTP and WTA aid CBA in valuing non-market goods such as clean air, safety, biodiversity or even preferences for sustainability itself in monetary terms. Although proven to be useful in the applied policy setting, there are certain academic debates around the concept and, therefore, implications of the use of WTP and WTA in CBA. For example, as presented by Kahneman et al. (1991), cognitive biases such as endowment effect and loss aversion might explain the observable disparity rather than equivalence between WTP and WTA. As such, cognitive biases might distort the values being measured, and hence, it should be viewed as approximate values to aid policymaking in tandem with other considerations instead of being a single definitive tool. Other academic debates surrounding WTP and WTA are essentially rooted in the general critique of the stated preference methods of valuation.

There are varied preferences for sustainability on firm or even country levels given the unique circumstances in which all agents are aspiring for higher standards of living. If developing countries are ever to converge with developed countries, then increased pollution is unavoidable at some point in time of the development. As such, an important thing to determine is the optimal level of pollution that a country/firm is willing to endure while simultaneously meeting its economic objectives. Similarly, given the trade-offs involved in different infrastructure financing models and regional approaches, it is equally important to assess the optimal scale and type of high-quality infrastructure investments that balance development goals with sustainability and institutional resilience.

3.1. WTP for Certified Sustainable Investment Products

The empirical findings by Gutsche and Ziegler (2019) show that private investors exhibit measurable WTP for sustainable investment attributes, trading off lower financial returns for higher ESG performance. This logic parallels the positioning of infrastructure initiatives such as PGII/BDN, GG, FOIP/PQI and 3SI, where higher-quality infrastructure investments may come with greater scrutiny, slower mobilisation, and stricter governance standards but are supported by value-aligned public and private stakeholders.

In stated choice experiments, participants are presented with a series of choice sets, each containing multiple alternatives that share the same attributes but differ in their attribute levels. For example, in Gutsche and Ziegler (2019), participants selected from several fixed-interest sustainable investment products (with an investment horizon of three years) that all had the same core attributes—such as the type of financial provider, annual nominal interest rate, consideration of sustainability criteria, and presence of transparency logos—but varied in the specific levels of these attributes (e.g., 1.3% vs. 1.7% interest rate, certified vs. not certified sustainability criteria, a transparency logo issued by an NGO vs. issued by the state).

The utility that respondent i derives from investment alternative j can be expressed as

$$U_{ijm} = \beta_i' x_{ijm} + \varepsilon_{ijm} \quad (1)$$

Here, x_{ijm} is the attribute vector of alternative j, β_i' is the vector of individual-specific taste coefficients, and ε_{ijm} is the unobserved error term. Non-financial attributes (e.g., sustainability criteria) are modelled as random, while financial attributes (e.g., interest rates) are fixed. To model unobserved heterogeneity, the coefficient for non-financial attribute k is expressed as

$$\beta_{ik} = \beta_k + \sigma_k u_{ik} \tag{2}$$

where β_k is the mean population preference for attribute k, and $\sigma_k u_{ik}$ represents the individual-specific deviation from the mean.

Each respondent completes M = 6 discrete choice sets, selecting one fixed-interest investment product out of J = 4 alternatives per set. These observed choices are used to estimate a mixed logit model using Simulated Maximum Likelihood (SML) estimation:

1. Make initial guesses of β_k and σ_k for each attribute k.
2. For each individual i, simulate 1000 random draws of their possible taste coefficients using Equation (2), where v_{ik}~N(0, 1) (only for the random non-financial attributes).
3. For each draw, compute utility U_{ijm} by multiplying the drawn β_{ik} values (for random attributes) and fixed β_k values (for financial attributes) with the observed attribute levels in x_{ijm}.
4. Incorporate observed heterogeneity via interaction terms between non-financial attributes and individual characteristics (e.g., strong "warm glow" feelings from making sustainable investments, high environmental awareness, or low perceived risk of sustainable investments).
5. Compute the probability of choosing the observed alternative in each set using the logit formula $P_{ijm} = \frac{\exp\,(U_{ijm})}{\sum_{k=1}^{J} \exp\,(U_{ikm})}$.
6. Compute the joint probability over all M choice sets, and average over 1000 draws to obtain the simulated likelihood for individual i.
7. Iteratively update β_k, σ_k, and the fixed interaction coefficients to maximise the likelihood of the observed choices across all individuals.

The mean WTP represents the financial attribute adjustment (e.g., interest rate reduction) required to maintain constant utility when a non-financial attribute (e.g., sustainability criteria) marginally improves. It is derived as the ratio of the partial derivative of utility with respect to the non-financial attribute to that of the financial attribute. Unlike traditional stated choice experiments where cost negatively enters utility, financial return positively affects utility. Therefore, a more negative WTP implies a higher willingness to sacrifice financial return for more sustainable or transparent investment attributes.

3.2. WTA on International Values, Norms, and Standards of Connectivity

The same stated choice experiment framework and mixed logit model may also be adapted to measure people's preferences for adopting international norms and standards at the expense of some degree of state sovereignty or local control, which could be relevant for the alternative initiatives like PGII, GG, FOIP, and 3SI. The utility function of individual i choosing alternative initiative j in choice set m can be written as

$$U_{ijm} = \alpha_1 G_j - \alpha_2 S_j + \beta F_j + \mu_i + \varepsilon_{ijm} \tag{3}$$

where $\alpha_1 G_j$ is the utility gained from adopting a given level of international norms and standards G_j, $\alpha_2 S_j$ is the disutility from losing a given level of state sovereignty S_j, βF_j is the utility gained from a given level of infrastructure funding F_j, μ_i captures individual-specific unobserved preference heterogeneity (e.g., political beliefs, national pride) and ε_{ijs} is the idiosyncratic error term.

To measure the compensating variation required to hold utility constant, i.e., the infrastructure funding required to make an individual indifferent between preserving sovereignty and accepting international norms and standards, the WTA expression can be written as

$$WTA_{G_j - S_j} = -\frac{\alpha_{1G_j} - \alpha_{2S_j}}{\beta} \quad (4)$$

If the benefit from adopting international norms and standards outweighs sovereignty loss (i.e., $\alpha_1 G_j > \alpha_2 S_j$), then WTA is negative, meaning that less infrastructure funding is required to incentivise the adoption. In contrast, if $\alpha_1 G_j < \alpha_2 S_j$, then WTA is positive, meaning more infrastructure funding is required to compensate for the perceived loss of sovereignty. These preferences, when aggregated, can be used to infer broader country-level attitudes toward sovereignty trade-offs.

4. Discussion and Conclusions

In an era marked by increasing geopolitical fragmentation, digitalisation, and a heightened awareness of human equality, the 21st century demands more than just physical development. It also calls for the enhancement of societal well-being, particularly in developing economies. Alternative infrastructure initiatives like PGII, GG, FOIP/PQI, and 3SI—driven by Western, European, and East Asian powers—aim to promote multilateralism and competition in delivering quality cross-border critical infrastructure. These efforts emphasise high standards of transparency, governance, sustainability and the diversification of risks in areas where China's BRI has traditionally fallen short. Yet, these initiatives involve trade-offs related to efficiency, coordination, inclusivity, and incentives. Given these trade-offs, we cannot claim that any single model is superior to another in terms of achieving welfare-enhancing outcomes and bridging development gaps.

As the BRI maintains its first-mover advantage with well-established physical and digital links, and shows improvements in addressing its deficiencies, it exerts pressure on newer initiatives to truly offer competitive advantages to developing economies and to demonstrate a robust financing framework. Moreover, the BRI already boasts approximately USD 1.175 trillion (Nedopil, 2025) in its extensive construction and investment portfolio while other initiatives are slow to pick up the pace (see Table 1). Given the pressing needs for economic growth and energy security in developing countries, it is important to ask the following: to what extent do the risks of substandard construction, project abandonment, non-performing loans, and disruption to local communities' lives constitute an acceptable trade-off for BRI-funded infrastructure projects? This reflects a broader infrastructure dilemma—one that often intersects with NIMBY sentiments and is not unique to the BRI. All major infrastructure initiatives must navigate complex trade-offs, requiring consensus-building and the alignment of incentives across multiple stakeholders: national governments, local communities, public funders, and private investors. While initiatives like the BRI and its alternatives can promote connectivity and improve living standards through geopolitical and economic soft power, they also entail risks related to financing, regulatory alignment, and the potential erosion of local sovereignty. These dynamics inevitably produce winners and losers. It is therefore essential to evaluate such projects through a Kaldor–Hicks lens, ensuring that the benefits to winners are, in principle, sufficient to compensate for the losses of those adversely affected.

It can be argued that the conflict between the adverse impacts of NIMBY facilities on local communities hosting them and societies at large demanding economic growth comes from China's inexperience in dealing with legal frameworks that are different from its own (Quah & Iuldashov, 2022). While the US- and EU-led or supported initiatives have yet to prove their competitiveness in the global market of infrastructure initiatives, they benefit

from longer histories of domestic infrastructure development and facility siting with a variety of legal frameworks (Fair, 2025; European Commission, 2014). However, these come at the cost of slower project rollout due to multilateral cooperation and coordination, stricter standards, transparency requirements, and bureaucratic procedures, which diminishes the original purpose of these initiatives—to bring about economic prosperity swiftly by connecting developed and developing economies. For many developing countries, the ideal approach likely lies somewhere between these extremes—ensuring both timely financing and implementation (which can only happen with robust coordinating mechanisms, project timelines, and reliable capital sources) while safeguarding quality, sustainability, and fairness. Fairness in this context can be meaningfully assessed through CBA using WTP or WTA methods. These tools help quantify both social welfare outcomes and the net present value of projects, enabling more inclusive and evidence-based infrastructure decisions. The BRI and other initiatives will need to co-evolve to better meet the needs in the developing world and this could be a unique opportunity for innovation in conflict resolution schemes that mitigate the NIMBY syndrome. Ultimately, whichever initiative is more capable of addressing NIMBY issues together with local authorities and communities, along with a practical roadmap of how the infrastructure projects will be financed and implemented, will be able to secure a larger share in the global market of infrastructure projects. As such, the competition between infrastructure initiatives is a positive development for the countries in need of such investments.

When the Asian Development Bank (ADB) estimated that a USD 26 trillion bill of infrastructure is needed in Asia from 2016 to 2030, this sum was adjusted to factor climate change impact (Asian Development Bank [ADB], 2017). In fact, the total amount pledged by all major Western and allied infrastructure initiatives combined remains substantially below the estimated infrastructure investment needs for Asia alone—let alone the global requirements. There is a wide array of investments needed such as the building of land and maritime networks, but the most important one by far is the energy sector. Most of the developing countries still primarily rely on fossil fuels to generate energy to sustain their economic growth momentum. This will continue to be the case in the foreseeable future despite the enormous social cost of carbon when both climate change impact and public health costs are taken into account. The transitioning of the global economy to meet sustainable development goals is not achievable with a one-size-fits-all solution. The developing world needs a wide range of policies, technologies, and funds to fulfil both environmental commitments and economic growth objectives. China, the US, EU, Japan or other countries are unable to meet these needs single-handedly. Developing countries will need all of these initiatives as potential infrastructure financing options to assess and pick what works best for them and their populace. The presence of competition is ultimately beneficial for all sides.

Competition also creates opportunities to cooperate in areas where cooperation brings about mutual benefits. One of such areas is addressing climate change and achieving sustainable development goals. Even with heterogeneous preferences at the national level, infrastructure projects under the BRI and alternative initiatives can be complementary rather than purely competitive at the regional level. As shown in the literature and grounded case studies (beyond official rhetoric), the BRI and initiatives such as PGII, GG, and FOIP often embody contrasting models—state-led versus market-driven, speed versus quality, hard versus soft infrastructure, etc. Each approach has its respective strengths and trade-offs. State-led financing under the BRI can provide rapid capital deployment, which may complement the quality assurance and private sector participation emphasised in Western and allied infrastructure initiatives. The implementation of the PPP model, which is still maturing in many developing economies, could benefit from such synergies.

In the case of 3SI, opportunities for coordination are evident—for instance, the proposed Three Seas Digital Highway aligns with China's Digital Silk Road; academic collaboration has emerged among universities along the New Silk Road; and the Belgrade–Budapest high-speed rail, a BRI project, could be linked to strategic 3SI projects such as Rail Baltica, enhancing regional connectivity and co-financing potential. Moreover, while clear differences exist today, these may narrow over time. As mentioned, the BRI has already expanded beyond hard infrastructure through its Digital Silk Road, Green Silk Road, and Health Silk Road, signalling an effort to catch up to the governance, sustainability, and inclusiveness standards promoted by other initiatives. As such, the potential for convergence and mutual learning among initiatives suggests that future complementarities could become even more pronounced, especially in addressing the evolving needs of developing economies. Ultimately, the role of global and regional infrastructure initiatives is to coordinate and trigger sustainable development within their respective spheres while collectively contributing to efforts in narrowing the global infrastructure gap. The whole world stands to benefit if such initiatives prove to be successful in addressing the global infrastructure gap.

Future studies could offer empirical answers to the following questions, which are complex and not easily resolved: Could the strict conditions for sustainable development imposed by alternative initiatives and the reliance on attracting sufficient private sector investment impede the development process? How would these alternative initiatives balance the need to simultaneously ensure mutual cooperation by engaging local stakeholders in the decision-making process and for the host countries to absorb a certain extent of values, norms and standards of the political and economic unions involved to ensure quality infrastructure? Would economic asymmetries between China and BRI-participating countries prove to be harmful in the long run? Is a non-zero-sum game possible to ensure that developed countries in these initiatives do not benefit purely at the expense of developing countries, considering the relatively less cohesive presence of a central coordinating body or unified leadership to ensure funding commitment compared to the BRI? With the backdrop of the U.S.–China trade war, what is the outlook for the financial sustainability of the BRI? Given the overlap in regional coverage, is there room for these initiatives to coexist and perhaps complement the BRI, despite geopolitical tensions?

Overall, competition between the BRI, PGII, GG and others is a good thing, as it can encourage all initiatives to strive for excellence, promote innovation and ultimately lead to better infrastructure projects and more economic development for the countries involved. At the same time, competition inadvertently creates conflicts of interest, undermines cooperation and collaboration in critical areas, and hinders the possibility to effectively achieve shared goals and objectives of both initiatives such as sustainable development and decarbonisation. It is important for both initiatives to strike a balance between healthy competition and cooperation and learn from each other in order to maximise their positive impact on economic development and infrastructure in developing countries.

However, initiatives such as the BRI, PGII, GG, FOIP, and 3SI are not make or break for developing countries. Ultimately, the economic future of the developing world is in its own hands, and much will depend on its own capability to manage the competing needs of its societies amidst a rapidly changing global landscape. Participating countries need to be pragmatic and act in their own interest to benefit the most from the competition. History has proven that even smaller countries could negotiate bilaterally with China and successfully achieve better offers. This means that each country needs to be conducting better cost–benefit analyses to estimate the demand for both tangible and intangible infrastructure elements and understanding their trade-offs to guide government spending. Such research would help ensure that investments are neither under- nor overspent, allowing these

initiatives to stand as worthy competitors (or even partners) to the BRI in bridging the infrastructure gap between developed and developing economies.

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Notes

1 Originally, 3SI included 12 countries, but Greece officially joined as the 13th member in 2023.
2 Includes the assessment of life-cycle cost and debt sustainability.
3 https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20240304-2 (accessed on 7 June 2025).
4 https://tradingeconomics.com/china/foreign-exchange-reserves (accessed on 7 June 2025).
5 https://tradingeconomics.com/united-states/foreign-exchange-reserves (accessed on 7 June 2025).
6 https://tradingeconomics.com/japan/foreign-exchange-reserves (accessed on 7 June 2025).
7 https://tradingeconomics.com/germany/foreign-exchange-reserves (converted to USD at the exchange rate as of September 2024) (accessed on 7 June 2025).
8 https://tradingeconomics.com/france/foreign-exchange-reserves; https://tradingeconomics.com/italy/foreign-exchange-reserves (converted to USD at the exchange rate as of September 2024) (accessed on 7 June 2025).
9 https://tradingeconomics.com/united-kingdom/foreign-exchange-reserves (accessed on 7 June 2025).
10 https://tradingeconomics.com/canada/foreign-exchange-reserves (accessed on 7 June 2025).
11 https://www.voanews.com/a/china-s-bri-brings-roads-rails-and-debt-to-africa/7306133.html (accessed on 7 June 2025).
12 https://2021-2025.state.gov/oecd-officially-launches-the-blue-dot-network-to-increase-quality-infrastructure-investments-in-emerging-markets (accessed on 7 June 2025).
13 Croatia joined the Schengen area in 2023, followed by Bulgaria and Romania in 2025. Croatia has also adopted the Euro as its currency in 2023.

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Perspective

Globalization and European Integration: A Central European Perspective

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Abstract: Two decades after the biggest ever enlargement of the European Union, post-transition countries face a series of challenges, posed primarily by de-globalization and growing illiberalism. Declining European competitiveness, as highlighted by the Draghi Report (2024), calls for major restructuring both regionally and community-wide. This invited survey article attempts to solve a puzzle: if Europeanization has not been very successful, how could it promote globalization? Furthermore, Central Europe counts as a success story, both in terms of convergence and in terms of stabilizing west Europe's previously restive neighborhood. Sustaining this success is not automatic. We posit the two main conditions. These are: more focus on *Ordnungspolitik* (single market, competition policy, and capital markets union) and de-emphasis of re-distrubution (CAP and Cohesion). We also show why and how Central Europe will decide the future of the EU and the ways it can cope with globalization.

Keywords: economic integration; economic development; growth and innovation; globalization; internationalization; global governance; capital markets; banking supervision; industrial policy

JEL Classification: F5; F6; P5; O2

1. Introduction

Globalization is conventionally defined in the international political economy literature as a process in which the logic of the market—revolving around practices of maximizing asset value—extend their working in a growing number of sectors and territories of the earth. Being a process going well beyond the economy and covering spheres of information, technology, culture, organization, and even family ties, this process has been around for at least five centuries, ever since the onset of colonization (Kolodko, 2023). European integration, by contrast, is a relatively novel and policy-driven phenomenon. This denotes the institutionalization of political, economic, social, defense, and intellectual convergence of those countries, who consitute first and foremost a community of values. The *finalité politique* is usually seen as a federal structure to emerge gradually in the distant future through the interaction of micro-, meso-, and macro-level processes. While it is policy-triggered, it has always been a largely spontaneous interaction among those levels. Following the classical Monnet Method, the process never focused on coherence, the main standard in the academe. Instead it followed—from the outset to this very day—the logic of the maximum practically feasible at any given point of time (Berend, 2021). In other words, there has always been a potential for further deepening and also for innovative improvement in all walks of life—a process we shall trace below. European integration has aimed, from

the very outset, at encompassing 'all European democracies'. Therefore, widening to the tipping point, set by the above initial definition of the Teaty of Rome of 1957, has been both a driver and a limitation of the process—an issue detailed in the definitive overview cited above.

In this paper, we attempt to highlight some of the salient new features of the interaction of thes two processes. Fundamentally, there are two approaches developed in the literature and in policy-making. One is the idea of 'fortress Europe'. Following extensive classical literature, starting with Jacob Viner (1950/2014), European integration has been presented on the analogy of nation-state building, or 'ever closer union'. The competing approach (Inotai, 1986) sees global orientation and thus global competitiveness as foundational for the success of regional, thus European, integration. With more than two decades of experience with the largest ever enlargement of the EU, the question arises: how has the accession of eleven Central and East European countries in 2004 to 2013 influenced this traditional and fundamental question? Adding a specific Central European perspective may provide some new insights in the global debates on competitiveness.

One of the most frequently invoked theses on the EU is that the main avenue of globalizaton for the transition countries is naturally via European integration. In this paper, we ask if, and under what conditions, this is the case. Globalization is thus seen as a given, and most of the challenges related to global transformations, from climate to peace creation and the mangement of unregulated mass migration, appeared as tasks to be outsourced to Community organs and policies. Central Europe serves thus as a testing ground for the success of EU policies. In line with the historiographic mainstream, we include Czechia, Poland, Slovakia, Hungary, and Croatia under this label, and exclude the Baltics and Romania, who often describe themselves as *Mitteleuropa* (Szűcs, 1983). The incremental move to supranational arrangements during crisis mangement in the EU in the nearly two decades since the Great Recession further strengthened the role of Community solutions.

In this paper, we refrain from a comparative analysis of individual country performances (Mátyás, 2024) and also spare the reader from lengthy analyses of the changing official positions of Central European countries on European integration. Legitimate though these avenues may be, we adopt a more abstract level of analysis. Namely what a specific group of nations, who share the Communist past, but also longer historical path dependence, could and will contribute to European integration. In the EU of 27, there are a number of groupings. Some of these are functional, as say the frugal countries or friends of cohesion. Others are more geographical, as with the Mediterranean countries, the Benelux, or Nordic EU members. These groupings do not overshadow in any way the national peculiarities of their constituents. Still, the Benelux, for one, has played an unmistakeable role in EU hisory. Likewise, Central Europe, as defined above, is composed of medium sized countries, above the size of Malta or Latvia, but below the engines of France, Germany, and Italy. Similarly, they are at a medium level of development, somewhere between Luxemburg and Bulgaria. Perhaps for these and other reasons, the Visegrád Group and Croatia have adopted a specific profile in the past decade or so, advocating 'sovereignist' policies, aiming at maximising the net EU transfer balance and resisting irregular mass migration. This moderately pro-Europen line has been complemented by a quite reserved attitude toward globalization, be that the movement of capital, labor, or technology, let alone regulations on the global scale such as the minimum corporate tax.

Central European countries—Slovakia, Hungary, Poland, and the Czech Republic—are rightly presented in the literature (Mátyás, 2022; Landesmann & Székely, 2021) as true success sories in European integration, and they are contrasted with the much more ambiguous path of Southeast Europe and the post-Soviet region. This is explained by their considerable convergence, and, in reverse, for the core EU, as a success of its strategy of

appeasing and integrating a traditionally restive Eastern neighborhood, two interrelated processes elaborated in the extensive volumes cited above. We shall also prove why and how the position of Central Europe will be decisive for the future of the EU.

It is legitimate to investigate how the EU, while struggling with is own crisis management, has succeeded in elevating Central Europe out of the doldrums, which other postcommunist countries equally aspired to but have not managed. Over and above specific issues of systemic change, not being the subject of the present article, the fundamental strategic question for Central Europe has been if European integration assisted their global competitiveness. This is a non-trivial issue, especially in light of the recent Draghi Report (2024), which analyzes the reasons for European lagging behind. Thus our puzzle is: how come a Community lagging in global competitivenesss could be of avail for Central Europe to become winners in globalization?

2. Watersheds in European Integration After the Crisis

During and because of joint management of the Great Recession, and particularly the sovereign debt crisis of 2008 to 2015, European integration has incremntelly abandoned its basically inter-governmental nature. It has given way, step by step, and largely outside of the formal framework provided by the Treaty on the Funcioning of the EU/TEFU[1], to increasingly supra-national arrangements.

Trade policy, in the case of international treaties, was transferred to the exclusive compentence of the Commission a long time ago. Turning the European Central Bank into a de facto lender of last resort—at least since the 'whatever it takes' watershed moment of July 2012—which has been followed by the ensuing unlimited supply of liquidity and the subsequent use of unconventional monetary policy instruments[2], has made the basically inter-governmentalist model of the EU a matter of the past. While in several areas, particularly in the Common Foreign and Security Policy, the joint strategy is rather fragmentary, in the above two major areas, especially the Green Deal of 2019 and the NextGen EU, its centerpiece, the Recovery and Resilience Facility (RRF),[3] or the extension of qualified majority voting, all have turned the EU into an increasingly supranational construct (Buti & Fabbrini, 2023).

Thus our research question revolves around the mismatch between European policies and global challenges. This includes the ups and downs of global capital markets, global banking regulations, global accounting standards, the global trading system as represented in the WTO, and its disciplines, migrations, pandemics, and technological changes. Long-term statistical analyses indicate that clustering of economic activity—primarily among structurally similar countries—tends to intensify, but this does not follow formal integrational structures (Casagrande & Dallago, 2024), which were shaped along political considerations and resulting alliances/value communities.

The real challenges are the newly emerging ones, which did not used to be in existence at the time of the adoption of the Treaty on the Functioning of the European Union in December 2009. The Lisbon Treaty represented a political compromise following the Dutch and French rejection of the Constitutional Treaty in 2005. In other words, it failed to address any of the structural—or indeed financing—gaps in the EU architecture.[4]

Among the new major challenges, we may mention the issue of de-globalization (Forum Discussion, 2022; and Halmai, 2023), the proliferation of bilateral trade agreements—the EU signed over 47 of these, while the US only is engaged in 1 major—and several minor—FTAs, the major being the successor to NAFTA, the USMCA, signed on 30 September 2018 by the first Trump Administration.

Furthermore, many of the processes of globalization, such as the workings of the multinational corporations, the global flow of foreign direct and portfolio investments,

the trade in services, as well as the flow of individuals, are not being managed by any global organization. Europeanization, by contrast, is, and this makes it different from other forms of regional groupings (Nagy, 2025). The General Agreement on Trade in Services of 1994 is though a discipline of the WTO, but unlike many other elements, it is based on national treatment, i.e, the protection of national providers as a rule, not based on free market access. This is due to resistance by the advanced societies who wish to protect their social standards from the inflow of cheap labor and services. This issue is a weighty one, contrary to global trade in farm products. The latter over-politicized issue is dwarfed by the fact that agriculture accounts to a mere 1 percent of the GDP of advanced economies and 2 to 5 percent of GDP in the Central European countries. By contrast, services account to close to four fifths of GDP in all rich and postcommunist countries.

Multilateralism still matters (Hoekman et al., 2023). Still, fragmentation, once considered to be just a short term reaction to COVID hysteria, seem to have survived as the 'new normal'. In other words, the building of politico-economic blocs and bilateralism in trade have become formative.

For small open economies, being part of a tried and tested regional institutional system is beneficial. Still, this would presuppose the availability of a more flexible European Union (Dallago & Rosefielde, 2021). But calls for flexibility are often relegated to accomodating vested interests, as we observe in the car industry, in large scale farming, or politically loaded fiscal management, openly disregarding any rules since 2019.

3. What the European Integration Solves

The above observations were wrong to be interpreted as denying the uses and efficacy of each and every European arrangement. It goes without saying that European integration has been a big success story. First and foremost, the international architecture securing prosperity in Europe has been built on the European Union (Wagener & Eger, 2014). While NATO members Greece and Turkey have often been led by their historic animosity to the brink of armed conflict, members of the European Union have been more like a South Italian family: loud and conflicting, but closing their ranks in times of crisis. The latter was exemplified by the unregulated mass migration of 2015, the COVID pandemic and the ensuing recession in 2020–21, and certainly the war in Ukraine. The latter has been going on since 2014, but reached new dimensions since the Russian frontal attack on 24 February 2022. While EU countries tended to adopt nationally different answers to these challenges, cooperation rather than confrontation shaped the ways individual adjustment measures were articulated. While criticism on the lukewarm and often formal ways of these are legitimate, these discords have never escalated into open conflicts. This shows the quite concrete educational role played by the decades of institutional cooperation in all walks of life. While Europe has not spoken with a single voice, the relapse into nationalism could be averted.

Staying at the level of 'negative integration' (Viner, 1950/2014), in terms of classical theory, can be continued. While market protection has been gathering momentum even prior to the pandemic and the defensive measures it induced, it is important to remind us of the studies (Fetzer & Schwarz, 2021) that have shown several counter-intuitive elements that explain why those 'temporary' measures solidified and survived under the Biden administration. The steel tarriffs were introduced in 2017 as part and parcel of the first Trump Administration's attack on multilateralism and global free trade. These measures clearly followed political targeting, and thus produced calculated benefits for a group of the US electorate that might have been involved in swing voting.

From this angle, we may esteem even more highly the fact that intra-EU attempts to segment the single market have invariably been thwarted. The single currency continued

functioning, and the Fiscal and Banking Union of 2012 has contributed to the joint and efficient crisis management of the Eurozone. By having turned the European Central Bank into a de facto lender of last resort—a function needed to combat sovereign debt crises—and by providing an unlimited supply of liquidity, Community level crisis management has reached a new quality—more on that can be found in Dallago et al. (2016). While external imbalancess inside the EMU increased, supranational action, including liquidity provision by ECB, took place outside the TEU framework and the original mandate of the ECB. Also, de facto supranationalism preceeded de jure formalization at the level of TFEU.

However, this implied, if anything, a further—unplanned—deepening of the single market and erecting a common, if incomplete, defense line against the ups and downs of the global capital market.[5] By creating the Single Supervisory Mechanism and the Single Resolution Mechanism, and through a special treaty, the intergovernmental European Stability Mechanism/ESM of EUR 750 billion, member states of the Eurozone created a joint and permanent 'firewall' against the shock of global markets and speculation. ESM is, furthermore, relevant as an instrument of regularly raising money, i.e., embodying the long resisted idea of joint debt issuance at the Community level, rather than by the individual member-states or the ECB or the EIB. In so doing—together with the Recovery and Resilience Facility[6]—it embodies the trend towards more supranationalism. This is grounded both in the technical neccesities of crisis management and the changing economic policy paradigm calling for a multiplication of fiscal efforts in order to ensure and assist post-COVID recovery. While this remains a contested issue in the literature, fact of the matter is that fiscal rules of the Stability and Growth Pact were suspended for 2020 to 2024, with the compromise of December 2023 giving way to interpretations of rules that are much more flexible than they originally had been (Jankovics et al., 2023).

Since the major postcommunist countries, including Poland, Hungary, Czechia, Romania, and Bulgaria, are not members of the Economic and Monetary Union, they cannot benefit from these new defenses provided by the unlimited supply of liquidity and joint bank resolution and supervision. It goes without saying that at times of global tremors, both the possibility to rely on the liquidity provision of the ECB (which is free of charge for the Eurozone members), the availability of joint and pre-planned procedures and measures of resolution, as well as the mere economic size of the zone of single currency deters attacks both on central banks and on systemically relevant commercial banks.

Thus, the decision to abstain from EMU membership, which is explained officially by a mixture of criticism of the original Maastricht criteria and the need to accelerate growth via nationally specific measures (Virág, 2020), comes at a heavy cost, namely, the safety belts created by a series of practical and effective measures by the European System of Central Banks and supported by special modifications in the Treaty on the Functioning of the EU, lastly amended by the ESM, effective after the ratification by all members, except Italy, by August 2023. The consequence of this negative vote is that the amended Treaty could not yet enter into force (Gramegna, 2024).

By far the biggest and most unforeseen global challenge for the entirety of the Union has been the big one-shot migration wave in 2015, a case for the impacts of globalization. The inflow of 1.3 million people has found the continent completely unprepared, despite the ongoing crises in the Arab World and the Sahel Belt of Africa.

It is straightforward and well analyzed in the economic literature (Cavaillé & Van der Straeten, 2023; Stoetzer et al., 2023) that the significant inflow has had immediate political consequences. For one, social support for redistribution has been declining, or as the authors put it, the approach has been more 'Americanized'. Second, support for right wing populist movements has been growing, with traditionally liberal contries like Sweden,

Austria, and the Netherlands seeing anti-migration right wing forces gathering momentum at the level of parliamentary elections and even to the formation of governments.

The EU has, by and large, been reacting in a spontaneous panic. Its legal system was constructed mostly under the impact of the horrors of World War II, thus institutionalizing refugee protection at a high, constitutional level. The Union level rules, called the Dublin-III Regulation, originating in 2013 and modified in 23 September 2020[7], make it the right and duty of the first safe country to assess whether a migrant, if and under what conditions, can apply for refugee status. Residence permits remain in the competence of national authorities. These basic arrangements have been overhauled by the new Migration Pact, adopted by the Council—following Parliament, but overruling formal opposition by Poland and Hungary—on 14 May 2024.[8]

The supranational system aims at fair burden sharing in order to relieve the disproportionate challenge mastered by the border countries like Italy, Spain, and Greece. It aims at redistributing migrants or making the defector countries pay a compensation for those willy-nilly hosting the irregular migrants, arriving in hundreds of thousands at the Community level each year.

Meanwhile, Home Affairs is an area where Community methods are not very deep, since it relates to the essence of sovereignty. While some decisions may be taken by qualified majority voting, individual administrations must respond to their local constituencies. Multi-culturalism is condoned at the abstract level, but traditionally multi-ethnic countries, from Belgium to France, Sweden, and Germany, face regular disruptions, up to the point of street clashes. In sum, the European Union is unlikely to become the main avenue of managing mass migrations, even if the opposition of the two Central European member-states—supportend tacitly by Austria, Czechia, Slovakia, and Finland—were to be overcome by diplomatic trickery.

The fourth major point is if and to what degree European integration has served the purpose, that being the stabilization of a restive and historically conflictual Eastern neighborhood. For a long time, it seemed that this objective has actually been reached (Turley & Hare, 2013), and at a relatively low cost. This holds especially if compared to the expensive and never fully overcome challenge of Southern enlargement by assertive and politically ambitious medium sized powers. Postcommunist countries were not slow to join EMU, with Slovenia introducing the Euro as early as 2007 and Slovakia back in 2009.

This consensus assessment has slowly but steadily been changing in the second decade of EU membership of Central Europe. The Baltic States have proven to be cases of successful and fast adjustment and catching up, introducing the single currency one by one, with Estonia joining in 2011, Latvia in 2014, Lithuania in 2015, followed by Croatia in 2023. The medium-sized members of Central Europe, Poland, Czechia, and Hungary, have decided not to join, though meeting the criteria has not posed an insurmoutable task to them. As the sources cited above explain, staying out of the EMU has primarily been a political option in order to retain sovereignty in terms of economic policy-making, and rejecting even the soft rule-based arrangements, such as the December 2023 edition of the Fiscal Compact.[9] While retaining the original principle of balanced budgets over the business cycle, the new version stipulates incremental correctives in the range of 1 percentage point of GDP per year, provision of a medium term schedule of adjustent, and drops the original threat of fines for countries in excessive debt and deficit. Thereby, most of the critical propositions in the literature have found their way in the new rules.

Such behavior in the medium-sized members-states bears the imprint of growing interventionism. While this is beyond doubt a global trend, both in terms of ideas and policy practice (Csaba, 2022), the fundamental assumption in terms of the Europeanization literature has been the opposite. Namely: capacity, the willingness and the power of

Community arrangements to enforce, through a combination of direct and indirect means, the prevelance of liberal intergovernmentalism. This would mean the application of formal rules but perhaps, even more, the spirit of legislation.

The establishment of the Fiscal and Banking Union in 2012, the informal turning of the ECB into a de facto lender of last resort, and a joint supervisory agency for systemically relevant finacial institutions all consitute deepening and supranationalism. The Single Supervisory Mechanism and the Single Resolution Mechanism are located in Franfurt, but are by no means part of the ECB. Both possess specialized staff and separate budgets. In addition to these major changes comes the Green Deal of December 2019,[10] the pet project of the first von der Leyen commission. With its obligatory targets, it also moves toward increasing supranationalism and diminishing intergovernmentalism.

This issue is certainly of immediate relevance since the December 2023 Council has agreed to launch accession talks with Ukraine, Moldova, and Georgia.[11] The change has immediate policy relevance. First, no post-Soviet country except the Baltics were allowed to join western alliances (the current war in and on Ukraine is waged on the percieved security threat of that country moving out of the Russian orbit). Second, adoption of the anti-spy law in Georgia in May 2024, modelled on its Russian equivalent, was already a clear indication how little even pro-western governments progressed in adopting the values of modern democracy, leading to the suspension of talks in the autumn (*Politico*, 30 October 2024). Nielsen and Siljak (2024) provide a detailed scrutiny of the immediate economic aspects of this controversial situation. Last, but not least, several countries in the Balkans, from North Macedonia to Montenegro, have long been queuing without membership prospects becoming more realistic than a decade ago. As long as EU policies focus on specific issues, from rule of law to green transition, industrial policy, and social protection, the relevance of the single market is declining among the policy fields. These focal issues, neatly analyzed in the Letta Report (Letta, 2024), while crucial for deepening, have willy-nilly been de-emphasized, at least in relative policy terms. The focus on further widening and special policies, as well as preparing for American disengagement under Trump 2.0 in defense matters, is likely to turn the EU more, rather than less, inward-looking. The propositions of the Draghi Report, cited in the introduction, with its call for extensive Community funding in the range of an additional EUR 750 billion, while the fate of a second RRF is still in limbo, and focusing on industrial policies modelled on the US Inflation Reduction Act, would definitely constitute such a turning inwards. Knowledgeable analysts (Voszka, 2024) rightly see it as an EU equivalent of the change in the global policy paradigm.

4. Global Challenges—Local Actions

Globalization is an ongoing process, at least in the past two and the half centuries since the emergence of the industrial revolution and colonization, which have together solidified the system of global trade and finances. From today's perspective, the main aspects include the irreversibility of the process, the secular tendency of welfare improving items, the technologically driven processes of systemic transformations which all require policies to become adaptive, pragmatic and foreward looking, i.e preparing for the unforeseen rather than believing in formal models, which are good at forecasting the extended reproduction of by and large given structures but fail at critical junctures (Kolodko, 2023). While hyper-globalization has not been a monotous process, but one interrupted by reversals, especially due to the locally bound nature of political systems in general and democracies in particular (Rodrik, 2011), four major trends of ongoing globalization have prevailed as secular tendencies, which we will cover below.

This explains the large number of policy changes of the past fifteen years that have gradually penetrated economic theory under the heading of 'new normal'. The global

financial system is perhaps an area where worldwide cooperation is required, both during normal and exceptional times. The post-Bretton Woods arrangement, aptly termed by Robert Triffin as a 'non-system', does require concerted actions by the major players in order to manage the expectations of millions of agents. The chief economist of the IMF, Gita Gopinath, in her article with J. C. Stein (Gopinath & Stein, 2021), explains that while invoicing practices of large firms will retain the fundamental role of the US dollar in the global system, this does not allow for the Federal Reserve and the US Treasury to act single handedly, disregarding the interest of the others and the need to gain their timely and voluntary cooperation, especially at times of difficulty. Therefore, the European Central Bank is just one of the several players that must keep an eye on what others are doing. Thus, it is by no means in the position to orchestrate any policy it deems necessary, say for attaining lower levels of unemployment, or higher levels of output, as southern EU members tend to require.

From this line of thinking, it follows that the first major risk is to stick to a national currency in a global economy ruled by a dominant currency, which serves first and foremost the interest of the world hegemon and its domestic considerations. Sustaining sovereign monetary policy runs the risk of being caught in a whirlwind should any new finacial crisis emerge. The longer most Central European countries decide to reject the safety belt of the Fiscal and Banking Union and the unlimited provision of liquidity by the ECB, the more adventuresome this option is likely to be. Further, as long as global private capital markets trade a multitude of values as compared to markets set by central banks themselves, the thinner the potential defense against a global finacial tremor is going to prove.

The second major challenge, which is truly global, has been that of migration. Migration has been a feature of globalization ever since the onset of the modern era, with the industrial revolution, the colonial system, and the gold standard constituting the main pillars. The 19th century witnessed major flows of persons, primarily to the Americas, which played a major role in managing overpopulation in Europe, not only in the South, but also in Scandinavia (Hutton & Williamson, 2008). The interwar period saw an age of restrictions, but following World War Two, migration has been stepping up. The massive arrival of guest workers to France and Germany and the inflow of persons from former colonies to the UK and Spain are well known and documented processes, as detailed in the above cited book. In the 21st century, the revolution in telecommunications and transport have synergically enhanced both the lure and the possibility of the relocation of persons. More recently, the mass migrant flows of 2015 to western Europe have illustrated an inflexion point. Likewise, the constant inflow of migrants to the United States in the past decade has become a focal electoral issue, depite the country traditionally being a melting pot of cultures.

Europe has tried to constrain the inflows, as discussed above, though with limited success. The main focus of activity has been the attempt to get several of the neighboring countries, from Turkey to Morocco, to take over control. Investigations have found enhanced and undifferentiated efforts to keep people where they are through indiscriminate, forcible means, disregarding globally accepted humanitarian accords.[12]

While these measures have contributed to dampening the inflow of irregulars, even its advocates are aware of the fact that these can not address the core issues. Global migration has been shown to be an outcome of basically demographic processes and, as such, is secular and irreversible (Dao et al., 2021). This means, first and foremost, that the problem can not be 'solved' by reverting the flows, but through a combination of a series of interconnected mesures. First, conditions in the sending countries must be calmed down, with civil wars and physical uncertainity overcome, as in the Sahel and the Middle East. Second, it must be acknowledged that the ageing societies of Europe definitely are

in need of inflow of young and productive labor. Third, it is a human right anchored in international law to relocate abroad in the hope of better political and economic status, not only under threat of life.

Without digression into this specific and complex problem, it is becoming clear that solutions to such issues must be searched for on a global scale via global coordinated efforts by governments, corporations, communities, and individuals. This could and should be complemented by a series of actions on the local scale to help integrate newcomers into the recipient societies.

Herewith we have come to the third main challenge, the disorder replacing the postwar liberal international architecure. On the one hand, the need to act in a concerted way is the requirement of our age, as seen above and below, and not only in the global economy. On the other hand, Russian aggression in Ukraine, the protracted Mideast conflict, the growing strains in the South China Sea, civil wars in many countries, and the proliferation of nonstate actors and violence committed by them, exemplified by decades-old recurring attacks on carrier ships in the Red Sea, all point to a different direction. Analysts rightly reflect on the fragmentation and decline of the established global order (Kendall-Taylor & Fontaine, 2024).

From our perspective, this is bad news, out of which we underscore just two factors. First, traditional international relations theory rests on the rationality postulate and has traditionally been state centered. While new forms tried to encapsulate irrationality (Mearsheimer & Rosato, 2023), this has not been more far-reaching than mainstream economics integrating the non-rational, non-materialistic behaviors widely observed in everyday reality. The emergence of nonstate actors, neatly exemplified by Hamas or Boko Haram, which seem to have been incorporated in the pre-existing system of governance, only to show the limitations of the latter with the passage of time, speaks for itself. Russian revival of imperial symbols has been but one illustration of the re-emergence of those forms of power brokerage, which seemed to have long been relegated to the relics of theory. Russian unilateralism, which has been observable since 2007 at the latest, if confronted with American unilateralism in the format of a stongman revival, is unikely to bode well for global and European security and democracies (Kagan, 2025).

Thus we observe that global cooperation along the lines of the classical United Nations can not be taken as given. Therefore, the normative and the descriptive lines of argument diverge even more than conventionally. Global cooperation has never been more needed[13], not least because of the processes of globalization. On the other hand, global governance, including regulating the behavior of multinational firms, which dominate global economic interchange, is in its infancy. Foreward-looking analysts correctly warn of the need to restructure the global security architecture built on a single responsible sovereign when the agent is conspicuously lacking (Papaconstantinou & Pisany-Ferry, 2025).

The trend towards more global governance has become uncertain in the past decade. In the post-1989 era, a new type of global order seem to have been emerging, where norms based behavior was on the rise. Still, the establishment of the International Criminal Court, with its seat in The Hague, in 2002 was seen by many as a watershed, and its procedures against war crimes have set precedents (even with the US abstaining). The Magnitsky Legislations, originating in the US in 2012, followed by Canada in 2017 and finally by the European Union and its 27 member states in December 2020, make individuals, even in government positions, personally accountable for human rights violations and corruption, including the freezing of their assets abroad, a measure with a potential for concrete action currently discussed at the highest policy-making levels (Foy, 2024a). These innovations point towards a global rules-based regime. This holds even if application on the ground is conditional on domestic balance of forces and interpretation of law (Labuda, 2023). Trump

2.0 is likely to test, but unlikely to abolish, those arrangements, norms, and procedures that ensure the minimum calculability needed for a peaceful, rather than a fully anarchic, global architecture and system of conflict mangement.

By contrast, real world events, not least the emergence of private armed groups as arbitrators of international disputes, from the Wagner Group of Russian mercenaries and the American Blackwell in Africa to Hamas and the Taliban, all point in a different direction. The de facto disintegration of the multilateralism of the World Trade Organization (Hoekman et al., 2023) is a clear case indicating the move towards governments acting single-handedly, even in issue areas regulated by binding international treaties, signed or even initiated by the very same actors. Without denying the growing relevance of various non-state actors like Al Qaida (a network of networks across three continents), we should stress the focal role of a different type of major state actor. Here, we refer to the change of attitude in Russia (since 2008) and China (since 2019) vis-a-vis this rules-based international order. Their revival of the old anti-colonialist discourse and actions to re-create what they term as a 'multipolar world' have led to a fundamental rearrangement in the global architecture. Rules anchored in the regime sketched above may or may not apply, which is a real challenge to each participant and the global community alike. Unilateralism, preached and practised by the Trump 1.0. Administration, but also continued under Biden, has done little to convince weaker partners about the value of voluntary rule-abiding behavor.

This truly global phenomenon renders the management of processes of globalization all the more difficult. As long as actors do not abide to the rules set and accepted by themselves, the Hobbesian *bellum omnia contra omnes* becomes the order of the day, and this at a time when truly global solutions are more needed than ever. Climate change is a clear warning sign of what dangers the no-go scenario has already yielded.

A fourth issue area of globalization is certainly climate change, an issue where the need for common action is on the agenda of policy-making. A recent book by Falkner and Buzan (2022) provides comprehensive theoretical and policy analysis, focusing on each major power with a significant environmental impact, of how these new trends in international relations meet challenges of global environmental governance. In their framework, great powers like the USA, Russia, China, and, of course, the European Union all have a special responsibility to act and protect.

Suffice it to cite that while in the EU, bureucratic decision-making may slow down interpretation, in Russian decision-making, this is not a problem due to its inherent centralization. However, the pre-eminence of military and economic considerations have tended to marginalize ecological issues and its civic advocates already prior to the war on Ukraine. India and China have both made committments to improve their environmental performance. However, recent analyses have shown that the post-COVID rebound in China does not follow, in reality, the new normative, but continues on a previous path of neglecting and damaging the environment, despite evidence that stricter regulations pay off economically (Ahmed & Khan, 2024).

5. Impetus from Central Europe

The jury is still out on whether the processes of globalization and Europeanization are complementary or contadictory. Once globalization is dominant, the EU may become more competitive owing to the move to supranationalism and deepening, described above. It is more than certain that Central Europe is in no position to downsize its involvement in the globalization process. If for no other reasons, the stagnation of European integration, owing to political discord and contrarian economic intersts, simply leaves no room for this type of shortcut. For instance, once trade is regulated under the multilateral WTO, there is a limited, if any, chance for any EU member to strike a special deal with the Trump 2.0 Administration

or China in disregard of European arrangements. The global minimum tax on corporations is another example, but the Green Deal also limits the scope for nationally distinct solutions.

It is, in part, the nature and severity of global challenges that underscore the relevance of processes extending over the European scene. Both triggers and incentives are such that any answer restrained to, or focusing on, specific and narrowly European options is likely to fail. Reliance on Chinese technology in many areas, or continued exploitation of the huge manufacturing capacity of the Middle Kingdom, looks to be inevitable and advantagous for all European economies, starting up with the powerhouse of the Community, Germany.

Similarly, many other challenges require cooperation and even coordination on a truly global scale. Most prominent among these is mass migration. This issue originates in factors on which European Union, as an international organization, has next to no immediate leverage. These include demographics, local military conflicts, poor governance allowing for rampant corruption, and authoritarian forms of rule, which have survived the third wave of democratization in Africa and Asia.

Truly effective measures to manage climate change in the medium and long run can be planned and implemented only at the global level, such as through the G28. We have not ventured into the intricacies of poor functioning of the United Nations system, but it is hard to overlook that in part similar, in part the very same disagreements that hinder the better use of existing global fora are bound to re-emerge should new gatherings be convened. The meagre, if any, results of the COP29 Summit in November 2024 in Baku, which was marked by disregard of major powers and a pro-fossil eruption of the host, illustrate our point.

In terms of the EU, the already ongoing deliberations on the new Multiannual Finacial Framework for 2028–2034 render the rethinking of priorities both possible and necessary. For instance, the expiry of the Resilience and Recovery Facility raises questions about the assessment of this innovation. One strand of the literature highlights the singular nature of the arrangement as an ad-hoc reaction to COVID along the lines of Keynesian thinking. Others are of the opinion that this form is a long overdue strengthening of Community budget owning to the growing number of commonly supported aims (Buti & Fabbrini, 2023). The Green Deal is just one—a project whose timeline runs until 2050. Neighborhood policies—the interface of global and EU processes—definitely require more spending even if we are to adopt the narrowest possible focus. Ongoing negotiations with old and new candidate states all should trigger a recalibration of existing expenditures. The most important two priorities are the farming needs of Ukraine, a country with already sizable agricultural potential but considerable lags in environment-related spending, and the cohesion needs of the countries of the Balkans on a broad range of issues, from transportation to institutional infrastructure.

In both cases speculative preliminary estimates of costs under non-reform expenditure scenarios run into the tens of bilions of euros, with two possible options. One would be to sustain RRF spending and integrate it in the Community budget, which would allow for the funding of the above noted needs. The alternative is the replica of the practice of the eastward enlargement in an even tougher form. To put it bluntly, if Ukraine is serious about membership, it should accept leaving its agriculture out in the cold (Brzezinski, 2024)—a proposition which runs counter to the interest of large export-oriented farms. In both cases, the angles of intra-bloc solidarity and global competitiveness are confronting. In theory, the doubling of current EU budget is conceivable, however it seems to be politically unrealistic due to the decreasing popularity of the entire European project, especially in net contributing countries.

The geopolitical turn, started by Trump 1.0 but sustained by Biden, especially by extensive industrial support schemes under the Inflation Reduction Act, has triggered a

European answer in the form of industrial policy embraced by the already cited Draghi Report. This is remarkable, since even the term used to be an anathema for most actors on the European scene. This new policy was, to date, a set of softening measures in various industries, not exclusively in passenger car production, that aim to take out the teeth of EU competition policy. The latter, through subsidy control, tended to be one of the most powerful components of European policy action. What is obvious that this European action was, up to now, reactive rather than pro-active. However, analysts (Seidl & Schmitz, 2023) rightly talk about a similarly dirigiste turn towards supranational market creation.

Taking note of these new developments, we may still stick to our guns (Csaba, 2003) in terms of claiming that globalization neither calls for nor allows the homogenization of policies. This means that the room for nationally distinct solutions is given, and even positively called for, by the specificity of context. This holds for most of the options for hedging against finacial market risks, an issue explained in great sophistication in Salachas et al. (2024). Regarding the interaction of global and European trends, Central European countries are certainly interested in a powerful and resilient Community, able and willing to protect their interest in global processes, be that the emerging trade wars and bilateralism, or environmental concerns, or social protection against models where welfare is basically a family business.

6. The Way Ahead: Towards Capital Market Union or Industrial Policy?

European integration has taken an ambiguous road since its Eastward enlargement over two decades ago. On the one hand, crisis mangement has gradually but irreversibly strengthened its supranational components against inter-governmentalism. The creation of the Fiscal and Banking Union in 2012, turning the European Central Bank into a provider of unlimited supply of liquidity,[14] creation of the Single Supervisory Mechanism and Single Resulution Mechanism, creation of its fiscal leg, the European Stability Mechanism, and the joint issuance of bonds, in part by ESM and in larger part to fund the New Generation Fund, have all implied steps that are not to be undone.

Brexit was the last radical attempt to reverse the flow of the times by the referendum in 2016 and ensuing formal leave in 2020. However, this step has not been followed by Dutch, French, Czech, or other exits, as feared by many. Despite this, it is undisputable that the sovereignist trend, represented most openly by Poland and Hungary, but supported tacitly behind closed doors by a number of other members, has also been present and seems to block any further move toward open supranationalism by means of extending qualified majority voting or multiplying contribution to common funds over the current 1 plus 1 percent of GNI.

All in all, the Central European experience indicates the value of being part of a common pool, the impact of which is often decisive on global affairs. The common currency, as well as the safety belt provided by the innovations of the Fiscal and Banking Union, are major bullwarks against global finacial tremors. Implementation of the Capital Markets Union, long delayed by national egoisms of regulators and fears of loosing protected national insurance and banking markets, pension funds, and other nonbank forms of savings, would be a step in the right direction. Measures have been intensified in 2021–24,[15] but resistance of national regulators remains.

It goes without saying that CMU would be a further step towards supranationalism. However, creating the space for private persons and firms to draw on other members' savings, thereby extending the Single Market and making it more lucrative for external players fom tranditional capital exporting regions, would be the proper answer to Europe's growth problem (Aslund & Djankov, 2017). The lattter is structural and not related to lack

of liquidity; thus, any amount of cyclical measures/QE remain insufficient to overcome this structural challenge.

The big strategic issue facing Central Europe remains the interaction of the global and the European (Csaba, 2018). This issue is easy to illustrate. The Franco-German engine of the EU adopted propositions on the competitiveness strategy for the coming period, focusing on less bureaucracy and more joint funding.[16] This is much more in line with what management studies and sectoral analyses would suggest, provided the RRF is indeed not taken as a one-shot event. This is a manageable task, as it involves no major new spending to be approved for Europe.

The European Parliament voted with an overwhelming majority in June 2023 for sustaining a resilient agriculture and sustained self-sufficiency for the Community. This is equal to the extension of the current funding of the Common Agricultural Policy until 2026 and perhaps also longer. The gravest threat to the no-go scenario is potential Ukrainian membership of the EU, which seems a rather speculative option at the time of finalizing this paper. Sustaining traditional CAP supports as a priority obviously contradicts the Green Deal, which is likely to soften up further under the second von der Leyen Commission. Assessing the situation, a joint World Bank and EU Commission study characterized the state of affairs as a 'hot mess in a hurry', citing social and political resistance to the actual funding of green projects that the quanitative targets approved would require.[17] This is exactly the opposite to what academically informed policy analysis suggests, namely more focus on digitalization and green transition as the two focal elements of the new grand strategy for the EU (Grevi, 2024).

Analysis of the second major expenditure channel of Community support, structural funds and investments (Spilioti & Anastasiou, 2024), have underscored their often questionable efficiency. The authors conclude that similarly to farming, it is the quality of national governance that is decisive on whether EU funds are put to good use.

In sum, the interplay of national, EU level, and global challenges are to become even more complex. Major reassessment of ongoing projects, re-calibrating competing and overlapping priorities with a view of funding possibilities, and the need to improve global competitiveness are urgent. The Draghi Report (Draghi, 2024) is a new strategy in the right direction (Forum Discussion, 2024). It is yet to be reflected in the Multi-Annual Finacial Framework for 2028–34.

There is no royal way ahead, and ongoing debates on funding[18] do not point in the desired direction. As a recent paper by Benoit Couré (2024), Chair of the Autorité de la Concurrence, rightly reminds us, there remain at least two problems. First: four fifths of the budget meant for industrial support remains in the competence of national authorities. Second, out of the EUR 750 billion earmarked for that purpose at the Community level, only 20 percent has actually been committed in 2021 to 2024. Judging by the nature of the controversies cited above, this situation is unlikely to change under the new MFF in 2028–34. Third, as Couré rightly notes, the two strong points in the new strategy, single market and competition policy, let alone the Capital Markets Union, are unlikely to be strengthened substantially. The focus on redistributive policies is to stay. In the case of further enlargement with Ukraine and the Balkans, it is even likely to grow. Thus, a strategy built on globalization and competitiveness is likely to continue to face the traditional hurdles of national egoism.

From this angle, the decisive question for the future is the following: Will Central Europeans, as under the Kaczynski and Orbán Administrations, continue to remain the mavericks of the EU and stick to a maximum redistribution possible, preferably via unreformed spending priorities on agriculture and cohesion? Or, alternatively, are they willing to accept broader economic rationality dominating low politics? In the latter case, they

should join the vanguard of those advocating Capital Market Union and liberalization of the services sector, in line with challenges of globalization.

Either way, as long as there is no breakthrough in qualified majority voting in EU affairs, Central European positions will be decisive for the future of Europe. This is anchored in their veto power, but not constrained to it. The more they go on with their 'sovereignist' policies, not confined to the radical Right, the more probably so. As it stands today, they are unlikely to support the two major calls of the Draghi Report, namely the increase of Community spending for innovation rather than wasteful traditional redistribution channels, and the further increase of supranational decision-making. The growing momentum of Euroskeptics, especially on the radical right, in post-election Austria, France, the Netherlands, Sweden, and Czechia may erect additional hurdles to such reform.

7. Conclusions

We have argued in this paper that joining in globalization—more rather than less—is in the interest of Central European countries. Should this insight materialize, European integration could also become more efficient, both globally and locally. Thus, Europeanization is not the ante-chamber of globalization, but–if manged properly—can be a vehicle in the broader process. The theory of globalization serving Europeanization, rather than the other way around, seems to hold under conditions of the 21st century, too. Being globally competitive is always good for European integration, and thus the reverse causality may hold. In turn, globalization and Europeanization are mutually supportive in theory. In policy practice, this holds only if the EU reforms advocated by the Letta and Draghi Reports materialize. Central European countries may foster it by adopting a set of more enlightened and less self-centered policies focusing on competitivenes, not redistribution.

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Notes

1 Consolidated version of the Treaty on the Functioning of the European Union. *Official Journal of the European Union*, c326/47/26.10.2012, last retrieved on 28 September 2024 via https://eur-lex.europa.eu/.

2 ECB: *The Eurosystem's instruments*. https://www.ecb.europa.eu/mopo/implement/html/index.en.html. Last accessed on 24 May 2024.

3 Out of which 338bn euros are grants, financed via joint borrowing and 385bn euro loans (of which 291 bn has been committed until end-2023, and additional 83.1bn to support existing programs as Just Transition and Horizon Europe). See EC: NextGeneration EU https://commission.europa.eu/strategy-and-policy/eu-budget/eu-borrower-investor-relations/nextgenerationeu_en last retrieved on 29 May 2024.

4 See more on these in Dallago et al. (2016).

5 On the technical, structural and policy complexities related to this point, which are beyond the scope of this paper, see the extensive analysis of Király et al. (2022).

6 More on the related debates in Buti and Fabbrini (2023).

7 Migration and Home Affairs: Country responsible for asylum application (Dublin Regulation). In: https://home-affairs.ec.europa.eu/policies/migration-and-asylum/common-european-asylum-system_en. Last retrieved on 17 May 2024.

8 Council adopts complete overhaul of asylum system. https://www.consilium.europa.eu/en/press/press-releases/2024/05/14/the-council-adopts-the-eu-s-pact-on-migration-and-asylum/ accessed on 17 May 2024. The website covers and provides links to the 10 new stipulations on various aspects of the asylum process.

9 Economic and Financial Affairs Coucil (8 December 2023). Economic governance review. https://www.consilium.europa.eu/en/meetings/ecofin/2023/12/08/, last retrieved on 20 May 2024. The source contains links to all adopted legal and economic documents regulating issues in detail.

[10] See European Commmission (2019).

[11] This is a further step from the candidate status allotted already in June 2022 to the three nations.

[12] Europe is funding the draconian practice of detaining migrants in North Africa and dumping them in the desert, investigation finds. See https://www.washingtonpost.com/world/interactive/2024/eu-migrant-north-africa-mediterranean/. Last accessed 21 May 2024. This practice has been outlawed by a recent ruling of the European Curt of Human Rights, cfEurope: Express: The migrants' dilemma. *Financial Times,* 11 January 2025, referring to 6.8 mn asylum seekers since 2015, 3.6 mn ordered to leave, out of which only 1 mn actually left.

[13] As expounded i.a in Kendall-Taylor and Fontaine (2024), trends of the past decade has revived a series of behavioural norms, and a proliferation of state and nonstate actors and alliances who follow a rationality distinct from the traditional logic of state-centered Realism. This multi-dimensional competition seem to prevail over academic insights calling for global concerted action, and not only in matters of environmental sustainability.

[14] In so doing the ECB has been transformed into a lender of last resort, a function far exceeding the mandate created by the original TEU and even the TFEU, cited at the beginning of this article. The proposal to incorporate this innovation in the treaties met resistance by major member-states, particularly Germany, fearing the impossibility of getting ratified in national legislations.

[15] What the EU is doing to deepen its capital makets. https://www.consilium.europa.eu/en/policies/what-the-eu-is-doing-to-deepen-its-capital-markets/. Last retrieved on 29 May 2024.

[16] "Scholz, Macron adopt 'competitiveness' guidelines to set EU agenda". See the article on *Euractiv,* 29 May 2024. https://www.euractiv.com/section/economy-jobs/news/scholz-macron-adopt-competitiveness-guidelines-to-set-eu-agenda/.

[17] See World Bank (2024).

[18] Cf the extensive section in the specialized portal, 'About MFF 2028–34', *Euractiv*, 24 September 2024. See also Foy (2024b).

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Heterogeneous Links Between Corruption and Innovation in a Global Economy

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Abstract: This study examines the impact of corruption on business innovation from a comparative perspective and shows that this relationship is inherently heterogeneous across firms and countries. It addresses two main research questions: (i) Does corruption facilitate or hinder innovation in the countries studied? (ii) To what extent is the relationship between corruption and innovation mediated/shaped by countries' institutional configurations and firm characteristics (foreign and domestic ownership)? We analyze data from the fifth and sixth waves (2012–2016 and 2018–2019) of the EBRD's World Bank Business Environment and Enterprise Performance Survey (BEEPS), using a balanced panel of 3584 establishments in 22 Eastern European and Central Asian economies. The results provide two key insights into the relationship between corruption and innovation. First, the institutional setting plays a crucial role in shaping both the strength and the direction of this relationship, for example, when comparing EU and non-EU countries. Second, the impact of corruption at the firm level varies depending on the ownership structure: the 'greasing' effect is particularly relevant for foreign firms operating in weak institutional environments, but appears to be ineffective—if not 'sanding'—for foreign firms in contexts with stronger anti-corruption controls.

Keywords: innovation; corruption; institutional quality; control of corruption; firm ownership

1. Introduction

This paper explores the impact of corruption-related issues on innovation. Globalization has driven international business researchers to examine the causes, characteristics, models, and theories of corruption, as well as its relationship with legal frameworks and firm-level outcomes. Given the challenges of the global economy, it is crucial to conceptualize corruption[1] as a source of economic risk and uncertainty.

Corruption is an international concern as it creates uneven competition, potentially hindering or facilitating the implementation of global economic strategies. Its complexity is further heightened by digitalization, which can serve both as a deterrent to corruption and as a catalyst for new risks.

The literature presents two opposing perspectives on corruption's impact. Scholars debate whether corruption "greases the wheels", fostering economic activity, or "sands them down", impeding growth and efficiency:

At the macro level, a limited number of empirical studies suggest that corruption can stimulate economic growth, particularly in environments with weak or ineffective institutions. At the micro (firm) level, a growing body of research on firm performance has yielded mixed, ambiguous, and sometimes contradictory findings.[2]

Overall, the relationship between corruption and the likelihood of innovation, particularly at the firm level and in poor and emerging countries, has not been fully explored. Despite the consensus on the negative country-level implications of corruption, its consequences for firms are less understood. In emerging markets, corruption remains a ubiquitous feature of conducting business (Cuervo-Cazurra, 2016). Additionally, a number of theoretical frameworks from different research streams have been applied in the literature[3]; nevertheless, the majority of studies did not expressly state which theoretical framework the authors had employed. To tackle these concerns, we are required to look into how corruption affects a company's ability to innovate.

A number of puzzles have been identified in the literature and in addressing these puzzles, we investigate the effect of corruption on firms' innovation from a comparative perspective by showing that the link is surely not uniform across firms and countries (Iorio & Segnana, 2021) and that in emerging markets, corruption remains a ubiquitous feature of conducting business (Cuervo-Cazurra, 2006). Two main research questions are addressed in the present study: (a) Has corruption boosted or harmed the firm innovative activities in countries under inspection? (b) To what extent is the link between corruption and innovation mediated/shaped by the countries' institutional configurations and business characteristics (foreign and domestic ownership)?

Corruption continues to be a major challenge for innovation in Eastern Europe and Central Asia despite institutional reforms and global integration. Little progress was achieved in these areas to reduce corruption, and non-market strategies so that bribery and non-market strategies remain common, creating regional disparities in institutional quality, innovation performance, and tolerance for non-market strategies, including corrupt activities (Krammer, 2009). In many developing countries, innovators face pressure from corruption, either as victims or targets of rent-seeking (Ayyagari et al., 2014). This stifles innovation, underscoring the need for stronger anti-corruption efforts and institutional improvements to support a fair environment for innovation.

Given their relatively similar historical backgrounds and large variations in institutional quality, pervasiveness of corruption, and innovation performance, these countries are undoubtedly the ideal setting for business research (Meyer & Peng, 2016) and testing the relationship between corruption and innovation. Additionally, comparing the nations that have joined the EU can provide a helpful comparison of how, over time, and in different countries, due to various institutional contexts, the relationship between innovation and corruption varies, in the presence of new European rules and incentives.

The rest of the paper is organized as follows. Section 2 picks up some theoretical suggestions on macro and micro mechanisms for coping with corruption and bribery at the country and firm level and identifies the main hypotheses. Section 3 explores the balanced panel that we utilize, and the main variables. Section 4 looks at data in the quest for an explanation. Section 5 introduces the empirical strategy and examines the main empirical findings. Section 6 concludes and discusses the policy implications.

2. Literature Review

Comprehensive reviews of the literature are available from various perspectives; therefore, we will focus here on some suggestions that emerge from these different viewpoints. We have picked some theoretical suggestions deriving from institutional and agency theory standpoints. They both offer macro and micro mechanisms for coping with corruption and bribery.

The institutional and new-institutional theories address legal and regulatory frameworks, government statutes and rules, and courts as establishments of social, political, and legal norms that influence behavior and decision-making. The institutional frame-

work affects firms' strategies and grants them legitimacy (North, 1990), addressing the role of formal and informal institutional factors in shaping firms' activities[4]. Even the micro-perspective offered by new comparative economics can be considered as part of new institutional economics (Dallago & Casagrande, 2021).

Firms' activities are strongly influenced by the interactions between institutions (formal and informal) and firms, under legal and social pressures, to accept the standards, values, and beliefs of their surroundings. Analyzed through the lens of transaction cost economics, corruption can be seen from a cost/benefit perspective; that is, it will discourage (encourage) firms and investors when the costs of the potential deal exceed (fall behind) its benefits (Rose-Ackerman, 2008). Corruption can either "sand" or "grease" the wheels of business. When it "greases the wheels", it enhances the performance and productivity of firms, representing a faster and less uncertain means to deal with bureaucratic obstacles. Conversely, corruption can "sand the wheels" by hindering firms' ordinary and innovative activities by imposing supplementary costs, thereby amplifying uncertainty.

Institutional and neo-institutional theories present questions regarding the ways in which a corrupt, formal, and informal institutional environment affects organizational legitimacy, values, corporate social responsibility, profitability, and strategic decision-making (Keig et al., 2015; Pantzalis et al., 2008). The impact on innovation is discussed by Krammer (2019) by examining how bribery can sometimes act as a workaround for innovators facing bureaucratic red tape, lack of political or familial connections, and uncertain political environments in emerging markets. Similarly, Krammer and Jimenez (2020) emphasize the significance of political ties for firms engaged in innovation, reinforcing the idea that political connections can shape business strategies and innovation outcomes. Even corporate innovations in the USA are affected by corruption that negatively shifts the entire distribution of innovation (Ellis et al., 2020).

From an international business viewpoint, institutional approaches suggest that the institutional environment of the host and home countries matters. The host country, which controls corruption and upholds the rule of law, has a significant influence on the firms' mode-of-entry decision (Rodriguez et al., 2005), partner selection criteria decisions about international joint ventures (Roy & Oliver, 2009), the boards of the joint ventures (Hearn, 2015), the selection of national managers (Muellner et al., 2017), and the practice of bribery in cross-border transactions (Baughn et al., 2010; Yi et al., 2018). The impact is also identified on a firm's export performance (Krammer et al., 2018), its earnings management (Bao & Lewellyn, 2017), and foreign direct investment location, all affected by the institutional environment of the host and home countries, of which the extent of corruption is one factor.

According to these theoretical suggestions, the quality of institutions defines the level of corruption in the host and home country, which influences the nation's and firms' behavior. The suggestion is that by improving the quality of institutions, the adverse effects of corruption can be minimized in international business.

Agency theory has treated the agency problem in international business, focusing on managers diverting corporate resources to maximize private benefits at the cost of shareholders because incentives are misaligned. Political institutions and the degree of corruption influencing business risk-taking decisions are related to this behavior (Boubakri et al., 2013). This clarifies the possible conflict that can arise in situations where the company's foreign subsidiaries provide bribes because of their political links with the company's headquarters (Yi et al., 2018).

In the presence of competing interests, agency theory postulates that manager-controlled businesses bribe more than shareholder-controlled businesses; empirical support for this idea is provided (Chen et al., 2015). Bribery and corrupt business practices have also

been linked to board features, including management or shareholder-controlled enterprises, and show that bribing by firms varies based on ownership structure.

To date, the literature on the effects of foreign firms on corruptive practices in host instances has produced contrasting conclusions; the literature on the effects of economies is inconclusive. For corruption on FDI, there is a negative (Cuervo-Cazurra, 2006; Javorcik & Wei, 2009) and a positive relationship (Barassi & Zhou, 2012) between corruption and FDI. Existing studies are divided between those that argue that multinational enterprises can bring about a reduction in bribery and those that argue the firms operating in international markets adapt to local conditions, norms, and practices, with foreign-owned firms paying larger bribes compared to domestically owned firms (Ashyrov & Masso, 2020). By studying the adjustments of multinational enterprises to corrupt environments, local market adaptation seems to prevail after entry (Couttenier & Toubal, 2017), while in other cases, the adjustment mechanism that originates in the previous investment in a corrupt system prevails before entry (Thede & Karpaty, 2023). Thus, past corruption experiences drive competitive advantage. In this last case, corruption appears to play a "sanding or greasing the wheels" role, which depends on the timing and the enterprise's objectives. This is the case, for instance, when considering different firms' objectives: when corruption is associated with export decisions (Ha et al., 2021) in developing markets where corruption has been affirmed as a common issue and even an accepted norm (Nguyen et al., 2016), a positive impact emerges, particularly in the case of powerful, large-sized firms or those facing no institutional constraints. However, the impact is negative on the likelihood of innovation (Lee et al., 2020).

When applying these suggestions to the relationship between corruption and innovation, a challenge arises from the two conflicting perspectives on corruption.

On the one hand, innovation is impeded by corruption. An example is offered by emerging and transitional countries: corruption at the firm level, in the manufacturing industry, and in regions with the worst governance or those that are more corrupt, has a significant negative impact on innovation (Lee et al., 2020). More contract-dependent firms are characterized by lower investments in R&D in Central and Eastern Europe (Athanasouli & Goujard, 2015), and the effects on innovation vary significantly across regions (Bukari & Atta Anaman, 2021).

But in the USA too, increased corruption seems to reduce innovation output—both on average and for the most innovative firms (Ellis et al., 2020).

On the other hand, as bribery makes it possible for more businesses to get beyond bureaucratic red tape and legislative barriers and speed up transactions, corruption can actually help a company innovate more quickly rather than stand in the way of it. This is the case in 30 emerging markets examined by Krammer (2019) where bribery helps product innovations or in some country cases such as India and Vietnam (Sharma & Mitra, 2015; Nguyen et al., 2016).

The Main Hypotheses

Theoretical considerations suggest that corruption can act as both a 'sanding' and 'greasing' mechanism for innovation. However, empirical evidence does not clarify the conditions under which corruption hinders ('sanding') or facilitates ('greasing') innovation, as well as the likely heterogeneous effects at different levels of analysis. This leads us to develop two hypotheses connecting innovation to institutional settings and specific business characteristics when this heterogeneity is taken into account, with hypotheses subject to empirical testing with multivariate analysis. An analysis devoted to identifying the impact of corruption in the presence of different institutional settings at a country level (in our case, the control of corruption) and different business characteristics at a firm

level (in our case, different ownerships) points to the coexistence of both sanding and greasing effects.

Hypothesis 1. *Corruption has a heterogeneous impact on innovation across countries. The relationship between corruption and innovation at the firm level is significantly influenced by country institutional control.*

Hypothesis 2. *Corruption has a heterogeneous impact on innovation across firms, when the different characteristics of firms are taken into account. When cross-border transactions are considered, firm attributes can either strengthen or weaken the link between corruption and innovation.*

The first hypothesis suggests that corruption can be positively or negatively associated with firms' innovative activities in countries with very different institutional controls over corruption. The second hypothesis suggests that in the presence of specific firm characteristics when home and foreign institutional environments come into play in the presence of foreign and domestic ownership and cross-border transactions, the positive (negative) link could be either reinforced or undermined. So, corruption's role in innovation is context-dependent, shaped by both institutional settings at a country level and firm-specific factors at a company level.

The empirical regularities in Section 4 and the multivariate analysis in Section 5 reveal the coexistence of two contrasting average effects: an overall sanding effect at a country level, where higher corruption correlates with lower innovation, and a greasing effect at a firm level, where more corrupt firms tend to be more innovative. However, if we examine the average greasing effects, the results reveal heterogeneity at a firm level (across firms).

First, in terms of the institutional environment, the greasing effect is evident in contexts with weak corruption control, where corruption facilitates innovation by helping firms bypass bureaucratic inefficiencies. However, in stronger institutional environments, corruption becomes ineffective and does not contribute to innovative activities. Second, the characteristics of firms—specifically, foreign versus domestically controlled ownership—further shape this relationship. In weak institutional environments, the greasing effect is more pronounced among foreign firms than domestic ones. To be innovative, foreign firms must adapt to the host country's conditions, including its corrupt practices. Conversely, in environments with strong corruption control, corruption impedes innovation: it is unhelpful for domestic firms and even more detrimental to foreign firms.

Ultimately, the impact of corruption on innovation is context-dependent, varying across countries and firms. Whether corruption is a facilitator or a hindrance to innovation depends on the institutional framework and the degree of adaptation required by firms operating within it.

3. Data and Main Variables

Our source of data is the EBRD's World Bank Business Environment and Performance Survey (BEEPS), an initiative jointly launched by The European Bank for Reconstruction and Development and the World Bank group[5]. We used data from 22 nations, all emerging markets, including more developed Central and Eastern European nations, transition economies from the Balkans and Central Asia, as well as Turkey. We used firm-level data on innovation and corruption from this survey. The main benefit of utilizing BEEPS is that data are gathered in a methodical manner using standardized questionnaires and stratified sample methodologies, which provide cross-country comparability and national representativeness. We combined the surveys V and VI, which covered the years 2012–2016 and 2018–2019, respectively, using each firm's identification number. This produced a balanced panel with 3584 establishments that belonged to registered enterprises.

The UNCTADSTAT categorizes seven countries (mainly from Asia and transcontinental nations like Turkey, Georgia, and Kazakhstan) as developing and fifteen countries (mainly European, including Russia) as developed. Six of the developed countries—Russia, Latvia, Lithuania, Estonia, Slovenia, and Poland—are classified as high-income by the World Bank. Some of these countries have undergone significant transitions from socialist to market economies, especially as part of their integration into the European Union.

The Appendix A's Table A1 lists companies by the nation that is being examined. The surveys analyze companies by country, focusing on establishments, which are individual units where business activities occur, such as service provision or industrial processes. Firms can consist of one or more establishments; about 10% of the cases of these surveys involve establishments that are part of larger firms. Even though the data are surveyed at the establishment level, we nevertheless refer to firms. The study also incorporates control over corruption data from the World Bank's Worldwide Governance Indicators, one of the six aspects of governance from the World Bank's Worldwide Governance Indicators, in the Appendix A's Table A3 lists each country's values for the control of corruption in 2013 and 2018.

Main Variables

The relationship between corruption and innovation involves two key variables essential to our analysis.

Innovations are commonly associated with major changes to a firm's products, services, and processes, typically building upon new knowledge. We consider product innovation. Data on new product introduction are obtained from BEEPS using the answers obtained from the question, "In the last three years, has this establishment introduced new products or services?" This variable (named *Innoprod* in the following analyses) is binary, as it assumes a value of 1 if a new product or service has been introduced; it will be 0 otherwise. The introduction of new products represents a central aspect of a firm's strategy and not only enables organizations to bring new products to the market but also challenges organizations to renew their technological capabilities (Krammer, 2019; Wang & Chen, 2018). It provides avenues to diversify and adapt to evolving markets and determines their subsequent survival and success.

The other crucial variable is corruption. The measure of corruption records bribes at a firm level. Our bribery metric is based on the question, "On average, what percentage of total annual sales, or estimated total annual value, is paid by firms such as this one, to public officials in the form of informal payments or gifts?". *Firm corruption* is a dichotomous variable that assumes values of 1 and 0 depending on whether the firm claims it has paid anything or nothing and has made an informal payment of any amount.

The following analysis shows that this dichotomous variable has a considerable impact on innovation, yet variations in a bribe's value have no discernible impact on the likelihood of innovation: what matters is not the amount that firms pay but whether they pay bribes or not.

We further hypothesize that the relationship between corruption and innovation is influenced by the institutional context in which the firm works. As a relevant measure of the quality of the institutional context, we consider the control of corruption one of the World Bank Worldwide Governance Indicators (we call it *Controlcorr*), and we suppose that the higher the level of the country's control of corruption, the lower the impact of firm corruption on innovation. To test this hypothesis, an interaction is introduced between corruption at the firm level and the control of corruption (*FirmCorruption*Controlcorr*).

In the preliminary analysis with the purpose of clarifying this link, we categorize countries into three groups based on the descending level of control of corruption.

More precisely, we consider the level of control of corruption in 2013 and 2018, and we classify countries according to the average between those two values:

Country Group 1 includes the seven countries with the highest average value of Control of Corruption (Estonia, Slovenia, Poland, Georgia, Lithuania, Latvia, and Croatia), Country Group 2 includes eight countries with an intermediate value (Montenegro, Turkey, Belarus, Serbia, Bosnia and Herzegovina, Mongolia, Kosovo, Albania) and Country Group 3 includes the seven countries with the lowest average value (Kazakhstan, Moldova, Russia, Kyrgyzstan, Ukraine, Uzbekistan, and Tajikistan)[6].

We are also interested in comparing the impact of corruption on innovation between domestic and foreign firms. (Foreign firms are owned at least by 10% by private foreign individuals, companies or organization, according to the FDI international accounts standards; the firms which are not foreign are considered as domestic firms). Therefore, we have created the dummy variable *Foreign*, having a value of 1 for foreign firms and 0 otherwise; we then interact this variable with *FirmCorruption* (*FirmCorruption*Foreign*).

In order to lessen the possibility of confounding effects and to capture additional company characteristics that might be connected to innovation and corruption, control variables will be incorporated in the multivariate analysis[7]. We have taken into account the basic innovation input, research and development (*R&D*), and other elements of the company's knowledge capital, such as staff training (*Training*) and ownership of foreign technology (*Fortech*).

The market's competitive landscape, including the primary market's competitor count, is also vital for evaluating product innovation: the number of competitors is a key control variable affecting product innovation according to how many companies reported the number of competitors in their primary market—with one option being "Too many to count"[8]. We have categorized competition into three levels: *Competition_1* (0–5 competitors, the benchmark), *Competition_2* (more than 5 countable competitors[9]), and *Competition_3* (uncountable competitors).

In the first part of the empirical analysis, the firm's ownership (*Foreign*) is included among the control variables. In addition, we include a dummy variable on the firm's presence in international markets (*Export*), the size of the company (*Size*), expressed as the log of the number of employees, sectorial variables, and a dummy variable for waves[10].

4. Institutional Quality, Corruption, and Innovation: Some Stylized Facts

As reported in the previous section, countries are organized into three groups according to their level of control of corruption. Table 1 reports the number of countries and firms in the sample for each group of countries.

Table 1. Sample of BEEPS dataset.

	Number of Countries	Number of Firms
Country Group 1	7	1362
Country Group 2	8	3068
Country Group 3	7	2738
All countries	22	7168

Source: EBRD's World Bank Business Environment and Performance Survey (BEEPS).

For each group of countries, the corruption control averages[11] are reported in Table 2, together with the percentage of firms paying bribes and the percentage of innovative firms. This table highlights the negative relationship between corruption and innovation across different country groups. As institutional quality—measured by the corruption control—declines from Group 1 to Group 3, corruption becomes more prevalent, and firms' innovative performance diminishes.

Table 2. Control of corruption, bribery, and innovation between groups of countries.

	Control of Corruption (Average)	% Firms Paying a Bribe "to Get Things Done" *	% Innovative Firms **
Country Group 1	0.596	4.40%	34.82%
Country Group 2	−0.337	7.68%	25.85%
Country Group 3	−0.982	11.41%	22.50%
All countries	−0.375	8.40%	26.27%

* Percentage of firms where *FirmCorruption* = 1. ** Percentage of firms where *Innoprod* = 1. Source: World Bank Worldwide Governance Indicators (column 2) and EBRD's World Bank Business Environment and Performance Survey (BEEPS), columns 3 and 4. Detailed information by country is reported in the Appendix A (Tables A1 and A2).

Table 3 below highlights the link between innovation and corruption by comparing innovative firms that engage in bribery with those that do not. This difference may indicate the impact of corruption at the firm level, both within specific groups and across the entire sample.

Table 3. Corruption and innovative firms *within* each group.

	% Innovative Firms Among Firms Paying Bribes (a) *	% Innovative Firms Among Firms not Paying Bribes (b) **	"Effect" of Corruption (a)–(b)
Country Group 1	38.46%	34.97%	+3.49%
Country Group 2	35.85%	24.20%	+11.40%
Country Group 3	40.32%	19.61%	+21.19%
All countries	38.30%	24.75%	+13.55%

* Percentage of firms where *Innoprod* = 1 among the firms where *FirmCorruption* = 1. ** Percentage of firms where Innoprod = 1 among the firms where *FirmCorruption* = 0. Source: *EBRD's World Bank Business Environment and Performance Survey (BEEPS).*

Although there is a positive correlation between corruption and innovation, its strength varies significantly across the three country groups. In Group 1, where institutional quality is highest, firms that do not pay bribes are almost as innovative as those that do. However, in Group 2—and even more so in Group 3, where institutional quality deteriorates—the innovation gap between firms that pay bribes and those that do not widen. This suggests that as institutional quality declines, the effect of corruption on innovation shifts from almost neutral to positive, with bribery becoming an increasingly important driver of innovation in weaker institutional environments.

The link between corruption and innovation is possibly different when we disentangle domestic and foreign firms. The distinction between domestic and foreign firms is based on ownership: firms with at least 10% foreign ownership are classified as foreign, while all others are considered domestic. Table 4 indicates that foreign firms are most prevalent in Group 1, where corrupt activities are less common compared to domestic firms. In contrast, Groups 2 and 3 show a lower presence of foreign firms, which correlates with more frequent corrupt practices. Additionally, within each group, foreign firms exhibit significantly higher levels of innovative activity than domestic firms.

By looking at the "effect" of corruption on innovation for both domestic and foreign firms (Table 5), the impact of corruption on innovation varies significantly depending on the group of countries being examined. While the overall effect appears to be positive and similar for both domestic and foreign firms, distinct patterns emerge within different

groups. In Group 1, corruption has a negligible effect on innovation for domestic firms, but a strongly negative effect for foreign firms. This suggests that the foreign firms paying a bribe do not include any innovative firms. In Group 2, corruption has a positive effect on innovation for both domestic and foreign firms, with similar magnitudes. This indicates that in these countries, bribery may facilitate innovation in a comparable way for both types of firms. In Group 3 the positive effect of corruption on innovation is stronger for foreign firms than for domestic ones. This implies that, in these countries, foreign firms may benefit more from corruption in terms of innovation, possibly by gaining access to key resources or overcoming bureaucratic hurdles.

Table 4. Foreign and domestic firms: corruption and innovation activities in *each* group of countries.

	% Foreign Firms *	% Corruption (Domestic Firms) **	% Corruption (Foreign Firms) ***	% Innovation (Domestic Firms) ****	% Innovation (Foreign Firms) *****
Country Group 1	8.15%	4.50%	3.19%	33.23%	53.27%
Country Group 2	5.74%	7.57%	9.62%	25.17%	36.93%
Country Group 3	6.83%	10.71%	20.65%	21.12%	41.40%
All countries	6.61%	8.12%	12.35%	25.13%	42.43%

* Percentage of firms where *Foreign* = 1. ** Percentage of firms where *FirmCorruption* = 1 among the firms where *Foreign* = 0. *** Percentage of firms where *FirmCorruption* = 1 among the firms where *Foreign* = 1. **** Percentage of firms where *Innoprod* = 1 among the firms where *Foreign* = 0. ***** Percentage of firms where *Innoprod* = 1 among the firms where *Foreign* = 1. Source: *EBRD's World Bank Business Environment and Performance Survey (BEEPS).*

Table 5. Corruption between domestic and foreign firms by groups of countries.

	% Innovative Firms Among Firms Paying a Bribe (a) *	% Innovative Firms Among Firms NOT Paying a Bribe (b) **	"Effect" of Corruption (a)–(b)
Country Group 1			
Domestic firms	40.82%	33.27%	+7.55%
Foreign firms	0.00%	54.44%	−54.44%
Country Group 2			
Domestic firms	35.03%	23.36%	+11.67%
Foreign firms	46.67%	38.30%	+8.37%
Country Group 3			
Domestic firms	36.65%	18.63%	+18.02%
Foreign firms	65.63%	34.43%	+31.20%
All countries			
Domestic firms	36.40%	23.65%	+12.75%
Foreign firms	56.00%	41.08%	+14.92%

* Percentage of firms where *Innoprod* = 1 among the firms where *Firm*Corruption = 1 and *Foreign* = 0 *(row above)* or Foreign = 1 (row below). ** Percentage of firms where *Innoprod* = 1 among the firms where *Firm*Corruption = 0 and *Foreign* = 0 *(row above)* or Foreign = 1 (row below). Source: *EBRD's World Bank Business Environment and Performance Survey (BEEPS).*

These findings highlight the complex relationship between corruption and innovation, suggesting that, while corruption might sometimes serve as a "grease" for innovation, its impact varies based on the firm type and the country's institutional context.

Some empirical regularities clearly emerge, related to countries and firms under inspection and in search of an explanation. First, as Tables 2 and 3 showed, in our sample the institutional settings matter for the link between corruption and innovation. At the firm level (within country) there is a growing positive link (greasing) when the institu-

tional corruption control is very weak so that corruption is a sort of necessary vehicle for innovations.

Second, as Tables 4 and 5 show, corruption could be helpful for innovative activities not only for domestic but also for foreign firms. When the overall greasing effect at the firm level is distinguished between firms with a significant share of foreign ownership and domestically controlled firms, the intensity of the link is magnified when corruption control is weak.

5. Estimation Strategy

In the multivariate estimation, we use a panel data model with random effects, which for our case is appropriate for only two time periods. The fixed effects model is less reliable with limited time periods, as noted by Hill et al. (2020). Additionally, when comparing domestic and foreign firms, the fixed effects model does not capture much within-firm variability, as few firms in time change their status from domestic to foreign. Thus, a random effects model is a better fit in this scenario.

As the dependent variable product innovation (*Innoprod*), is binary, probit is an appropriate model. The interaction effect between *Firm corruption* and the control of corruption is estimated through the following Model (1):

$$Innoprod_{i,t} = \Phi\{\alpha_0 + \beta_1 FirmCorruption_{i,t} + \beta_2 Controlcorr_i + \beta_3 FirmCorruption_{i,t} \times Controlcorr_i + \beta_6 wave_i + \mathbf{X}\boldsymbol{\gamma} + \lambda_s + u_i + v_{it}\} \quad (1)$$

where i and t are, respectively, firms and time. Φ denotes the cumulative standard normal distribution; *Innoprod* stands for the binary variable, if a product innovation has been introduced or not in the past 3 years; *FirmCorruption* is the binary variable with value 1 if the firm paid a bribe, *Controlcorr* is the control of corruption of the country where the firm is located (we adopt the value in 2013 for the first wave and the value in 2018 for the second wave of our dataset), $\mathbf{X}$ is the matrix of control variables (details in Section 3) with their vector of coefficients γ; wave is the time dummy variable (observation from survey V or VI); λ_s are sector dummies; the error term has an individual-specific time-invariant component (u_i) and an idiosyncratic component (v_{it}).

The interaction effect between *Firm corruption* and the kind of firm (domestic or foreign) is estimated through the following Model (2a):

$$Innoprod_{i,t} = \Phi\{\alpha_0 + \beta_1 FirmCorruption_{i,t} + \beta_2 Controlcorr_i + \beta_3 FirmCorruption_{i,t} \times Controlcorr_i + \beta_4 Foreign_{i,t} + \beta_5 FirmCorruption_{i,t} \times Foreign_{i,t} + \beta_6 wave_i + \mathbf{X}\boldsymbol{\gamma} + \lambda_s + u_i + v_{it}\} \quad (2a)$$

$Foreign_{i,t}$ is the binary variable with value 1 if the firm has at least 10% of foreign property.

This model is estimated for each of the three nation groups independently as well as for the entire dataset. The modest variability and low number of observations implies that the interaction effect of *FirmCorruption* on innovation cannot be estimated for foreign firms in *CountryGroup* 1. Conversely, a linear probability model can be estimated for each country group. This is the rationale behind using the model known as (2b) for group comparisons.

$$Innoprod_{i,t} = \alpha_0 + \beta_1 FirmCorruption_{i,t} + \beta_2 Controlcorr_i + \beta_3 FirmCorruption_{i,t} \times Controlcorr_i + \beta_4 Foreign_{i,t} + \beta_5 FirmCorruption_{i,t} \times Foreign_{i,t} + \beta_6 wave_i + \mathbf{X}\boldsymbol{\gamma} + \lambda_s + u_i + v_{it} \quad (2b)$$

In non-linear models, like probit, it is impossible to determine with accuracy the sign and significance of interactions by simply looking at the sign, entity, and significance of their coefficients: the marginal effects of each variable at different levels need to be estimated separately (Ai & Norton, 2003). Therefore, estimates are made up of the marginal effects of *FirmCorruption* on *Innoprod* at different levels of *Controlcorr* (Model 1) and of *Foreign* (Model 2a). In contrast, the coefficients in the linear probability model directly represent the size, sign, and significance of the marginal effects. The next section displays each marginal

effect, along with its confidence interval, for the linear probability model and the probit model using several graphs.

5.1. Results

As a first step, in order to analyze whether firm corruption has a different effect on innovation at different levels of corruption control, we estimate Model (1). Table 6 reports the results of the estimation of Model 1. The average marginal effect of *FirmCorruption*, separately calculated, is positive (0.085) and significant at 5%. (If not differently specified, in the data below, the term significant means significant at a 5% level). Figure 1 reports the estimated marginal effect of *FirmCorruption* at different levels of *Controlcorr*. It shows that the impact of firm corruption on product innovation decreases as the control of corruption increases. From a greatly favorable influence when control of corruption is low to a negative (albeit insignificant) impact when control of corruption is strong, the effect of company corruption on product innovation declines as the *corruption control* grows[12].

Table 6. Model 1: panel probit model with random effects.

Variables	**MODEL1 (Dependent.Var: *Innoprod*)**
FirmCorruption	0.176 (0.043)
Controlcorr	0.224 *** (0.041)
FirmCorruption * Controlcorr	−0.330 ** (0.136)
Foreign	0.272 *** (0.086)
Competition_2	0.105 (0.055)
Competition_3	−0.378 *** (0.053)
R&D	0.792 *** (0.061)
Training	0.400 *** (0.048)
Fortech	0.203 *** (0.061)
Export	0.243 *** (0.057)
Size	0.027 (0.020)
Wave	0.132 *** (0.043)
Industry dummies	Included
Constant	−0.518 (0.625)
Statistics	
Number of observations	5206
Number of groups (firms)	3241
Log likelihood	−2519.6499
Wald chi2 Prob > chi2	(160) 578.38 0.0000
LR test of rho = 0	Chibar2(01) = 2.50 Prob ≥ chibar(2) = 0.057

*** $p < 0.01$; ** $p < 0.05$. Standard error in brackets.

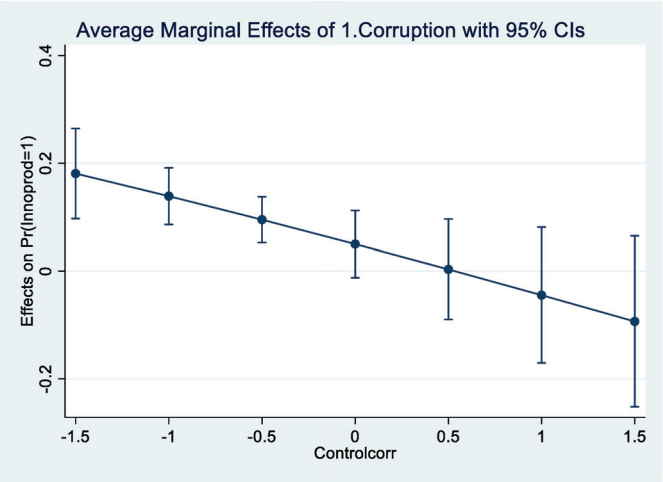


Figure 1. Marginal effects of firm corruption on product innovation at different levels of control of corruption. Panel probit model with random effects.

As a second step, we have evaluated whether or not the impact of corruption on the share of innovative firms is different between foreign and domestic units of analysis. To evaluate if the impact of *FirmCorruption* on product innovation is different between foreign and domestic firms, Model 2 is estimated, in both the whole sample and in the three country groups. Both the probit model (2a) and linear probability model (2b) are estimated. Coefficients of *FirmCorruption* among domestic (on the left) and foreign (on the right) firms are illustrated by Figures 2–5 as results of the probit model for the whole sample (Figure 2), of the linear probability model for Country Group 1 (Figure 3) and of the probit model for Country Group 2 and 3 (Figures 4 and 5)[13].

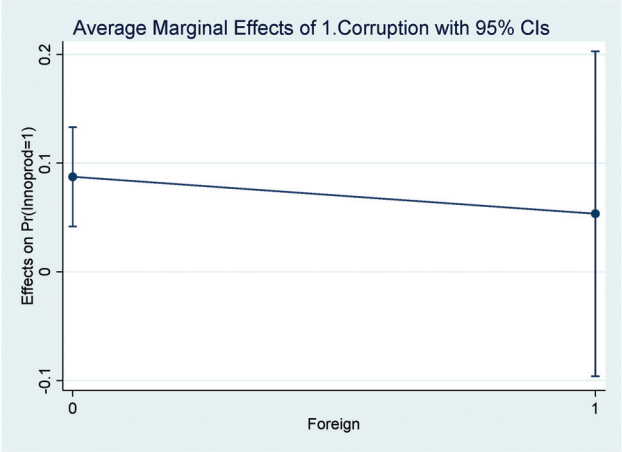


Figure 2. Marginal effects of firm corruption on product innovation in domestic and foreign firms. Panel probit model with random effects. All countries.

There is no discernible difference in the impact between domestic and foreign enterprises when looking at the entire sample (Figure 2), but some intriguing differences show up when looking at country groups: in Country Group 1 (Figure 3) the effect of *FirmCorruption* on *Innoprod* is positive and significant for domestic firms while for foreign firms it is negative and significant; the difference in corruption effect between domestic and foreign firm is also significant. Similarly to Country Group 1, in Country Group 2 (Figure 4) the corruption effect is positive and significant for domestic firms and negative for foreign firms, but the effect for foreign firms and the difference in corruption effect are not significant here. In contrast to the other country groups, in Country Group 3 the

impact of *Firm Corruption* on *Innoprod* is positive for both domestic and foreign firms and significant for domestic and foreign (in case of linear probability model[14]) with a bigger influence for foreign firms (the difference is not significant) (Figure 5)[15].

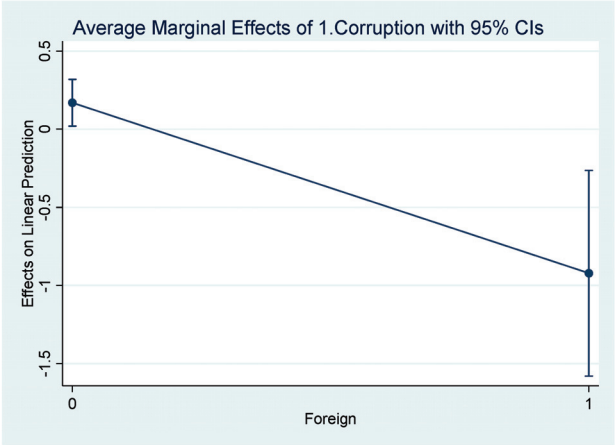


Figure 3. Marginal effect of firm corruption on product innovation in domestic and foreign firms. Panel linear probability model with random effects. Country Group 1.

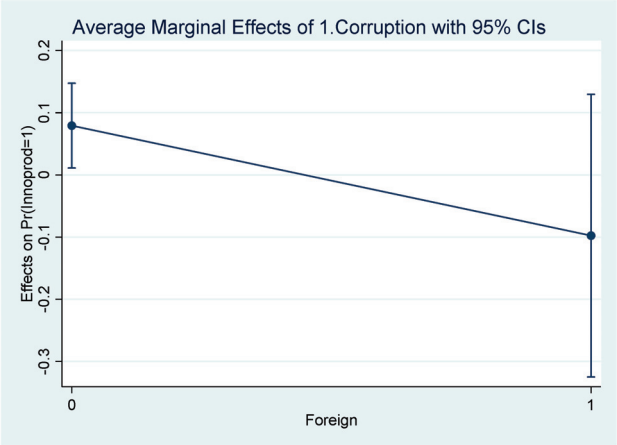


Figure 4. Marginal effects of firm corruption on product innovation in domestic and foreign firms. Panel probit model with random effects. Country Group 2.

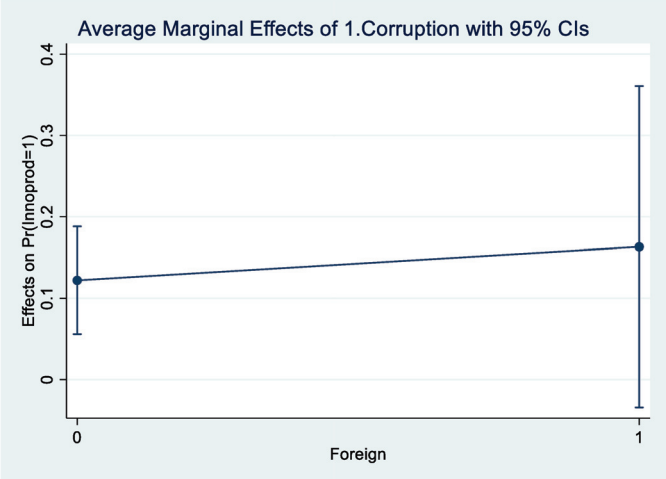


Figure 5. Marginal effects of firm corruption on product innovation in domestic and foreign firms. Panel probit model with random effects. Country Group 3.

Table 7 gives a detailed framework of the marginal effects. For both domestic firms and foreign firms, it displays the estimated marginal effects of *FirmCorruption*, according to the probit model and the linear probability model, along with their significance, for the various groups of countries and the entire sample.

Table 7. Estimated marginal effects of *FirmCorruption* in panel probit (first row) and panel linear probability model (second row).

	Domestic Firms (a)	**Foreign Firms (b)**
Country Group 1	+0.176 **	Not estimable
	+0.170 **	*−0.922* ***
Country Group 2	+0.079 **	−0.098
	+0.070 **	*−0.093*
Country Group 3	+0.122 ***	+0.163
	+0.119 ***	*+0.170* **
All countries	+0.087 ***	+0.053
	+0.086 ***	*+0.054*

*** $p < 0.01$; ** $p < 0.05$.

In conclusion, with regard to domestic firms, the relationship between corruption and innovation is always positive in the whole sample and in each country group, while remarkably, the same relationship changes across groups for foreign firms: it is negative and significant in Group 1, negative but non-significant in Group 2, positive and, according to the linear probability model, significant in Group 3.

Summing up, we can conclude that both bivariate and multivariate analyses show two heterogeneous aspects of the link between corruption and innovation.

The former regards the heterogeneous link in the country-comparison perspective in line with hypothesis 1. The overall effect of corruption on innovation is positive (in the entire sample), but it is not uniform across the sample. Descriptive statistics indicate that when countries are grouped according to decreasing levels of corruption control, the impact of corruption on product innovation is nearly neutral in the group with the highest level of control, positive but relatively limited in the group with intermediate control, and very high in the group with the lowest level of control. The inverse relationship between the intensity of the corruption–innovation link and the level of control of corruption is thoroughly and confirmed by multivariate analysis.

The second aspect of heterogeneity is at the firm level and concerns the ownership of the enterprises, whether domestic or foreign; it correlated with hypothesis 2. In this situation, looking at the entire sample, the direction and intensity of the link between corruption and innovation do not differ significantly across domestic and foreign enterprises. However, inside each group of countries, interesting differences emerge. For domestic firms, the link between paying a bribe and innovative capacity is positive throughout the sample; for foreign firms, when the country's institutional quality is high, such a link is negative; when the country's institutional quality is low, paying a bribe is a vehicle for innovation, in the same way, and even more than for domestic firms.

5.2. Alternative Methods

When analyzing panel data, the traditional choice is between fixed effects and random effects models, each with distinct advantages and limitations. Fixed effects models control for time-invariant individual characteristics but only capture within-group variation. In

contrast, random effects models allow for both within- and between-group variation but are more susceptible to omitted variable bias. Given that our dataset includes only two time periods, within-group variation is limited, making a fixed effects model less suitable. A Hausman test comparing fixed and random effects models further supports the choice of a random effects model. Alternatively, a non-panel probit model could be used, treating the data as a pooled cross-section without accounting for individual effects[16].

Appendix A Figures A1 and A2 display the coefficients for *FirmCorruption* across varying levels of *Controlcorr*, estimated using a fixed-effects logit model and a non-panel (pooled) probit model with clustered errors, where countries serve as clusters. Both models produce consistent interaction patterns: as *Controlcorr* increases, the coefficient of *FirmCorruption* declines, shifting from significantly positive to statistically insignificant. This effect is significant at the 10% level in the non-panel probit model and approaches significance in the fixed effects model[17]. In summary, despite varying levels of statistical significance, results from bivariate and multivariate analyses consistently converge and indicate that the relationship between corruption and firm-level innovation strengthens in weaker institutional contexts.

In addition to these alternative functional forms, we also incorporate additional country-level variables to account for institutional quality, macroeconomic performance, and development. Specifically, we considered the rule of law, regulatory quality, and government effectiveness from the Worldwide Governance Indicators, along with GDP per capita, the Doing Business Index, and the Human Development Index, either as complements or substitutes to *Controlcorr*. However, their simultaneous inclusion with *Controlcorr* is not feasible due to high correlation, and replacing *Controlcorr* with one or more of these variables does not enhance the model's explanatory power.

6. Conclusions

Corruption has been widely studied in the literature because, to varying degrees, it poses a significant challenge to economies and societies worldwide. The paradoxical coexistence of a positive impact on business performance and a negative effect on national economic growth makes tackling corruption necessary, yet highly complex.

Globalization and digitalization can act both as deterrents to corruption and as catalysts for new threats. Many anti-corruption programs operate on the assumption that openness, liberalization, and privatization are essential tools for combating corruption. By connecting the seemingly separate discussions of corruption and globalization, it becomes clear that corruption is a major obstacle to the effective implementation of international economic strategies aimed at fostering innovation—an issue further compounded by the potentials and pitfalls of digitalization (Malik & Froese, 2022). However, a crucial aspect is often overlooked: the institutional and political roots of corruption. These factors must be carefully considered when designing policies (Rose-Ackerman & Truex, 2012; Ohnsorge & Yu, 2021) to better understand their impact on politically connected firms (Colonnelli & Prem, 2022; Xu & Yang, 2024) and to gain deeper insight into how corruption influences resource allocation within firms.

Our results reveal a first heterogeneous effect of corruption—both "sanding" and "greasing"—depending on the level of analysis (country vs. firm level). On average, countries with higher levels of corruption tend to be less innovative. However, at the firm level, corruption is, on average, positively associated with firms' innovative activities. These average effects, however, mask significant differences across institutional contexts. In countries with weak institutional control, corruption often functions as an informal mechanism that facilitates innovation by helping firms circumvent bureaucratic inefficiencies. In contrast,

in countries with strong anti-corruption measures (for instance, EU member states in our sample), corruption has no significant impact or may even hinder innovation.

Additionally, when distinguishing a second heterogeneous result, the greasing effect is magnified in foreign firms in countries with a poor corruption control. In these contexts, foreign enterprises must adapt to local conditions, often engaging in corrupt practices to remain competitive and innovative. Conversely, in countries with strong anti-corruption enforcement, corruption is not only ineffective but actually detrimental to innovation, particularly for foreign firms.

These findings align with existing research on foreign firms in host countries, indicating that businesses operating in global markets must often adjust to local norms and institutional conditions to drive innovation. Our results further support the view that corruption can serve as both a necessary enabler of innovation in certain settings and an ineffective tool in others.

In summary, the lesson for policymakers is that addressing corruption and its relationship to innovation is a complicated issue with unintended consequences arising from the interplay between macro-institutional variables and firm-level business characteristics.

As a result, anti-corruption policies must be carefully tailored to market and non-market business strategies: not all anti-corruption efforts are effective in breaking the nexus between government and business or in reducing rent-seeking expenditures in favor of innovation.

While our study provides valuable insights, several limitations remain. Firstly, although the panel data allows us to draw long-term implications of bribery strategies, future research should go into greater detail, by for instance including a better understanding of the methods for reticence-adjusted estimates of corruption. Secondly, although the BEEPS dataset is widely recognized as one of the best sources of data for detecting firm-level corruption, it is prone to measurement challenges. This requires utilizing microdata to overcome the limitations of cross-country macro data, as well as determining the best technique for evaluating corruption in both observational and experimental settings.

Author Contributions: R.I. and M.L.S. conceived the presented idea. M.L.S. developed the theoretical suggestions drawn from the literature and R.I. applied the methodology, performed the computations and verified the analytical methods. Both authors contributed to the design and implementation of the research, to the analysis of the results and to the writing of the manuscript. All authors have read and agreed to the published version of the manuscript.

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Informed Consent Statement: To gain full access to the firm-level data of the EBRD-World Bank Business Environment and Enterprise Performance Survey (BEEPS), registration is required. This includes signing the BEEPS Data Confidentiality Agreement, which can be accessed at BEEPS Terms and Conditions (https://www.beeps-ebrd.com/terms-and-conditions/ last accessed on 12 March 2025).

Data Availability Statement: The raw data supporting the conclusions of this article will be made available by the authors on request.

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Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Table A1. Firms by country, percentage of innovative firms (product innovation), of firms paying bribes and of foreign firms.

Countries	Number of Firms	% Innovative Firms (Product)	% Firms Paying Bribes	% Foreign Firms
Albania	152	23.36	21.21	8.22
Belarus	158	35.24	4.41	12.66
Bosnia and Herz.	151	43.67	6.20	7.28
Croatia	71	39.44	6.82	7.75
Estonia	63	29.37	2.04	11.11
Georgia	110	25.45	0	5.91
Kazakhstan	140	17.69	9.13	2.86
Kosovo	78	48.08	7.69	0
Kyrgyzstan	147	40.29	32.76	19.34
Latvia	90	40.00	1.99	14.44
Lithuania	75	30.14	3.91	4.00
Moldova	142	32.16	7.75	8.80
Mongolia	172	36.63	16.87	4.65
Montenegro	69	21.01	12.50	8.70
Poland	194	31.95	7.04	4.12
Russia	400	16.94	8.44	3.12
Serbia	145	38.54	6.93	9.31
Slovenia	78	54.25	6.87	16.03
Tajikistan	115	19.65	10.81	4.35
Turkey	609	11.08	3.39	2.79
Ukraine	168	33.23	27.34	5.36
Uzbekistan	170	11.50	1.88	12.35
TOTAL	3.584	26.27	8.40	6.61

Source: EBRD's World Bank Business Environment and Performance Survey (BEEPS).

Table A2. Control of corruption by country.

Countries	2013	2018
Albania	−0.70	−0.52
Belarus	−0.47	−0.19
Bosnia and Herz.	−0.24	−0.57
Croatia	0.12	0.13
Estonia	1.19	1.51
Georgia	0.47	0.71

Table A2. *Cont.*

Countries	2013	2018
Kazakhstan	−0.93	−0.50
Kosovo	−0.65	−0.52
Kyrgyzstan	−1.16	−0.95
Latvia	0.33	0.33
Lithuania	0.43	0.50
Moldova	−0.75	−0.73
Mongolia	−0.48	−0.43
Montenegro	−0.25	0.02
Poland	0.60	0.64
Russia	−1.01	−0.85
Serbia	−0.30	−0.37
Slovenia	0.73	0.87
Tajikistan	−1.28	−1.42
Turkey	−0.09	−0.34
Ukraine	−1.26	−0.87
Uzbekistan	−1.26	−1.07

Source: World Bank Worldwide Governance Indicators. Values of such index range from −2.5 (minimum control of corruption) to +2.5 (maximum level of control of corruption).

Table A3. Description of variables.

Variable Name	Kind of Variable	Description
Country Group	Categorical	1. The establishment is located in one of the following countries: Latvia, Lithuania, Estonia, Poland, or Slovenia. 2. The establishment is located in one of the following countries: Croatia, Serbia, Bosnia and Herzegovina, Montenegro, Albania, Kosovo, Ukraine, Belarus, Moldova, Georgia, or Turkey. 3. The establishment is located in one of the following countries: Russia, Uzbekistan, Tajikistan, Kazakhstan, Kyrgyzstan, or Mongolia.
Innoprod	Binary	1 = In the last three years, the establishment has introduced new products or services. 0 = otherwise
FirmCorruption	Binary	1 = In the last three years, the establishment has paid an informal payment "to get things done". 0 = otherwise
Controlcorr	Continuous	Value of the *Control of Corruption* index of the country where the firm is located (See Table A2)
Foreign	Binary	1. Ten percent of the firm is owned by private foreign individuals, companies or organizations. 0. Otherwise
Competition	Ordered categorical	1. Low: in the last fiscal year, in the market where the establishment sells its main product, it faced from 0 to 5 competitors. 2. Medium: the establishment faced more than 5 competitors (but still countable) 3. High: the establishment faced uncountable competitors ("too many to count").

Table A3. *Cont.*

Variable Name	Kind of Variable	Description
RD	Binary	1. In the last three years, the firm has spent money on R&D activities, either in-house or contracted with other companies (outsourced). 0. Otherwise
Train	Binary	1. In the last fiscal year, the establishment had formal training programs for its permanent, full-time employees. 0. Otherwise
Fortech	Binary	1. The establishment uses technology licensed from a foreign-owned company, excluding office software. 0. Otherwise
Export	Binary	1. In the last fiscal year, a positive percentage of the establishment's sales are direct or indirect exports. 0. Otherwise
Size	Continuous	Natural logarithm of the number of employees.
Wave	Binary	1. Survey VI 0. Survey V

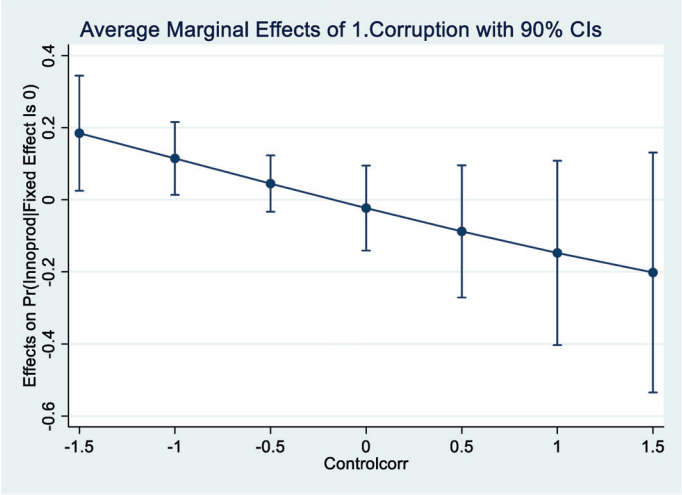


Figure A1. Marginal effects of firm corruption on product innovation at different levels of control of corruption. Panel logit model with fixed effects (90% confidence intervals).

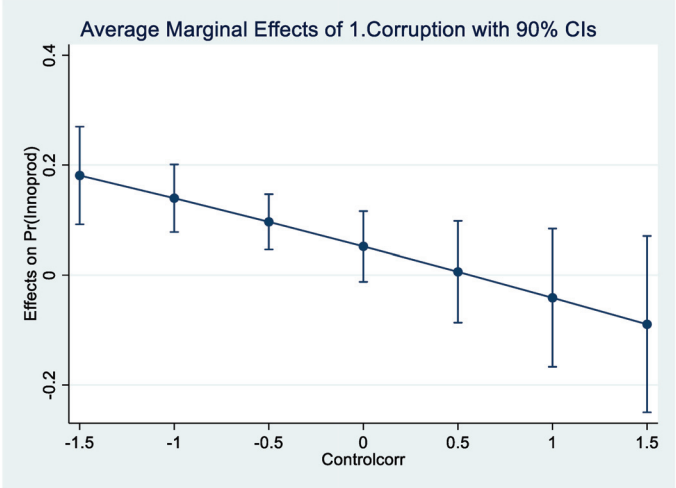


Figure A2. Marginal effects of firm corruption on product innovation at different levels of control of corruption. Pooled probit model with clustered (countries) standard errors (90% confidence intervals).

Notes

1 Transparency International defines corruption as; the abuse of entrusted power for private gain https://www.transparency.org/en/what-is-corruption (accessed on 12 March 2025); and bribery is a subset of corruption defined as the offering, promising, or giving of something to influence an official. Corrupt transactions can be extremely simple or extremely complex. They include both grand (political) and petty (administrative) corruption, as well as organized and disorganized corruption. In any case, no definition of corruption is fully clearly-cut. It also has many different interpretations, varying over time and context as well as by discipline. Notwithstanding the differences in definition between corruption and bribery, in this work we use the two terms as synonymous.

2 Among the 50 micro-level empirical studies analyzed by Martins et al. (2020) focusing mostly on single countries, 31 studies have concluded that corruption (mostly bribery) is harmful to firm performance, whereas 19 suggest the opposite.

3 Bahoo et al. (2021) in the bibliometric analysis of the literature on corruption in the discipline of economics between 1968–2019 identify seven streams of the literature.

4 Voigt (2012) focus on how to measure institutions and updates the North' view of formal and informal institutions and later Voigt (2018) identifies the difficulties in measuring informal institutions.

5 Original data can be downloaded at the link https://www.beeps-ebrd.com/data/ (Last accessed by the authors on 12 March 2025).

6 From the perspective of their locations and histories, the three groupings of nations -based on their ranking of their control over corruption- appear to align closely: all the countries in the sample that are part of the European Union, along with Georgia, are categorized in *CountryGroup* 1. Meanwhile, all countries from the former Soviet Union, except for Belarus (which ranks significantly higher in terms of control over corruption) and the Baltic states (which share much of their history with Western Europe), are placed in *CountryGroup* 3.

7 The choice of control variables has been spearheaded by the literature in this area: size, R&D investments, foreign ownership, competition, and exporting are also included by Krammer (2019) as control variables; Karaman Karaman Kabadurmus and Sylwester (2022) include licenses for foreign technology.

8 The complete question, numbered E2 in the Questionnaire, is: "In regard to the main market to which this establishment sold its main product, how many competitors did this establishment's main product face?"

9 5 is chosen because it is the median among the firms declaring a countable number of competitors.

10 Country dummy variables are not utilized, because their inclusion would prevent evaluating the effects of the between variability of *Controlcorr*.

11 Weighted mean of the Control of Corruption for each country reported by the Worldwide Governance Indicator of the World Bank Group. Data by country are reported in Table A2 in the Appendix A. The range for Control of Corruption is from −2.5 (minimum control of corruption) to +2.5 (maximum control, of corruption), Weights are the number of firms for each country included in the sample.

12 The 95% confidence intervals do not overlap when comparing the lowest and highest *Controlcorr* levels, indicating that the decreasing effect of *FirmCorruption* as *Controlcorr* increases is statistically significant at a level of 5%.

13 Results of probit model are more reliable than results of linear probability model. Nevertheless, due to the limited number of cases, probit model was not estimable in *CountryGroup* 1.

14 According to the probit model, this result is very close to the 10% significance threshold: $p = 0.103$.

15 These findings hold regardless of the composition and size of country groups. We estimated a model incorporating a triple interaction between *FirmCorruption*, *Controlcorr*, and *Foreign* across the entire sample. The estimated marginal effect of FirmCorruption on innovation was then computed for both domestic and foreign firms at different levels of Control of Corruption (high, intermediate, and low). The results remain consistent with previous findings.

16 The likelihood ratio test of rho = 0 applied on the estimation of the random effect probit model (results in Table 6) is inconclusive (close to 5% threshold) on the importance of panel-level component of variance; hence the legitimacy of non panel probit estimation.

17 If the non-panel probit model is estimated using ordinary or robust standard errors, the interaction effect between Firm*Corruption* and *Controlcorr* is significant at a 5% level. Similarly, the interaction between *FirmCorruption* and *Controlcorr* remains significant at 5% when estimated using a linear probability model with standard OLS. Although the linear probability model is generally considered unsuitable for a binary dependent variable, this result is noteworthy in the context of omitted variable issues: as Bun and Harrison (2019) demonstrate, an OLS estimator remains consistent when estimating the interaction between an endogenous and an exogenous variable—where *Controlcorr* can reasonably be considered exogenous.

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Market Volatility vs. Economic Growth: The Role of Cognitive Bias

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Abstract: This study aims to investigate the interaction between market volatility, economic growth, and cognitive biases over the period from April 2006 to March 2024. Market volatility and economic growth are critical indicators that influence economic stability and investment behavior. Financial market volatility, defined by abrupt and erratic changes in asset values, can have a big impact on the expansion and stability of the economy. According to conventional economic theory, there should be an inverse relationship between market volatility and economic growth since high volatility can discourage investment and erode trust. Market participants' cognitive biases are a major aspect that complicates this connection. Due to our innate susceptibility to cognitive biases, including herd mentality, overconfidence, and loss aversion, humans can make poor decisions and increase market volatility. These prejudices frequently cause investors to behave erratically and irrationally, departing from reasonable expectations and causing inefficiencies in the market. Cognitive biases have the capacity to sustain feedback loops, which heighten market turbulence and may hinder economic expansion. Similarly, cognitive biases have the potential to cause investors to misread economic indicators or ignore important details, which would increase volatility. This study uses the generalized autoregressive conditional heteroskedasticity (GARCH) model on GDP growth data from the US, the UK, and India, alongside S&P 500, FTSE 100, and NIFTY 50 data sourced from Bloomberg, to examine evidence of these biases. The results show evidence of the predictive nature of market fluctuations on economic performance across the markets and highlight the substantial effects of cognitive biases on market volatility, disregarding economic fundamentals and growth, emphasizing the necessity of considering psychological factors in financial market analyses and developing strategies to mitigate their adverse effects.

Keywords: market volatility; economic growth; cognitive bias; investor sentiment

1. Introduction

Market volatility is the natural fluctuation in the prices of an asset in the financial market. Fear or uncertainty due to negative news or a recession can lead to selling, which lowers prices. Understanding that volatility is a normal phenomenon of a healthy market is critical for investors, especially newbies. Contrary to popular belief, volatility is not always the trigger for doom. As a matter of fact, occasional volatility may indicate a robust and dynamic economy. As new businesses are established, innovation flourishes, and corporations make investments in expansion prospects, economic growth exacerbates market volatility. As investors evaluate the prospects of these initiatives, stock prices are subject to fluctuations due to this intrinsic dynamic. Although some companies could fail, others might emerge as the next great success story, eventually supporting the economy's expansion as a whole. It is not always evident, though, how volatility and economic growth are related. Sometimes, there is a correlation between rapid economic growth and higher market volatility.

Confirmation bias makes things even more complicated. It causes us to seek information confirming our beliefs, ignoring conflicting evidence (Huttunen et al. 2020). This can lead us to ignore negative news about our investments or overestimate the potential of companies that align with our biases. In addition, investment decisions can be influenced by loss aversion, the tendency to feel the pain of loss more strongly than the joy of victory (Wang et al. 2023). This emotional reaction can lead us to sell investments prematurely to avoid losses, even if the long-term outlook remains positive. Recognizing and mitigating these cognitive biases is essential for investors to make sound decisions in the face of market volatility.

Navigating a turbulent market requires a disciplined approach (Erixon and Johannesson 2015). Strategies include maintaining a long-term investment horizon, diversifying portfolios across asset classes, and managing emotions to make rational decisions. Diversifying portfolios across asset classes, industries, and geographies can help reduce risk and the impact of single events or market downturns (Shin et al. 2019). Techniques such as dollar-cost averaging, where investments are made at regular intervals regardless of market conditions, can help mitigate the effects of emotional decision-making. By implementing such strategies, investors can navigate the challenges of volatile markets and take advantage of growth opportunities. However, managing emotions, especially during times of increased volatility, is critical to rational decision-making.

Therefore, understanding the interplay between market volatility and economic growth, especially through the lens of cognitive biases, is crucial for both investors and policymakers. Some studies have found interactions between market volatility and economic growth where fluctuations in stock markets can predict economic growth, whereas, on the contrary, some studies have suggested no correlation between them (Babatunde 2013; Silva et al. 2017; Chang and Li 2024). In this study, we aim to investigate how cognitive biases, specifically herding, confirmation bias, and loss aversion, affect market volatility and its divergence from economic growth. The contribution of this study lies in its novel integration of these cognitive biases into the analysis of market volatility and economic growth using the generalized autoregressive conditional heteroskedasticity (GARCH) model. Although many studies focus on either cognitive biases or empirical modeling, those exploring how these biases manifest in market volatility and diverge from economic fundamentals are rarely found in existing literature. This study fills that gap by providing an interdisciplinary approach that combines behavioral finance with econometric modeling. This study aims to identify the evidence of these biases and seek insights into the relationship between market volatility and economic growth. By examining the role of cognitive biases, such as herding behavior, confirmation bias, and loss aversion, we can better grasp the psychological factors driving market dynamics. This study is organized as follows: the Literature Review Section provides an overview of existing research on cognitive biases in financial markets, summarizing the findings and the research gaps from the most relevant literature; the Methodology Section details the empirical and theoretical approaches used to analyze the data, including the application of the GARCH model; the Results and Discussion Section presents the findings, demonstrating the evidence of cognitive biases impacting market volatility and their relationship with economic growth; and, finally, the Conclusion Section summarizes the key insights and suggests areas for further investigation to enhance our understanding of behavioral finance in the context of market volatility and economic growth.

2. Literature Review

Understanding growth is vital, and studying the various factors that might influence growth is important and of great relevance in the current times when economies are facing new and unique challenges regularly. With globalization, emerging technologies, and the varied financial products introduced, economies are influenced by a myriad of factors. Stock markets are the true reflection of real economic growth, and the fluctuations in stock markets can help forecast economic growth. This can be illustrated by looking at how

the growth of economies worldwide has been impacted by some events, like the 2008 international financial crisis (Chang and Li 2024).

Volatility is certainly related to economic growth both directly and indirectly. Volatility in stock markets hints at growth when the investors sort out their portfolio by excluding weak stocks and including viable ones, which leads to a stronger economy (Babatunde 2013). Hong Vo et al. (2019) examined the causal and dynamic relationship between derivatives and economic growth by employing a Granger causality test in the framework of a vector error correction model (VECM). Derivatives are the instruments used to mitigate the effects of volatilities and risks. In this study, authors could establish short-run relationships, with the derivatives market positively contributing to economic growth, but such effects faded away in the long run.

Ameziane and Benyacoub (2022) also tried to examine the direct and indirect effects of volatility on economic growth. The authors used the GARCH model and Dumitrescu and Hurlin the Granger non-causality test to establish the relationship between volatility and economic growth and concluded that volatility penalizes economic growth both directly and indirectly. Government policies and frameworks may intervene in such circumstances.

Volatilities in stock markets impact economic growth and vice versa (Babatunde 2013). Fluctuations in markets impact various capital markets, such as credit markets and foreign exchange, and such volatilities contribute toward high-quality capital formation and accelerate growth (Chang and Li 2024).

The efficient market hypothesis (EMH) proposes that stock markets are efficient in processing all available information, and in an efficient market, the prices fully reflect the available information, investors are not irrational, and any volatilities in stock prices can be explained with fundamentals (Spulbar et al. 2021). However, stock markets have evidenced chaos, and reconciling randomness is difficult. An explanation for this is given by Lo (2004), who proposed the adaptive market hypothesis (AMH), which is the evolutionary behavior of investors combined with the efficient market hypothesis. Accordingly, the informational efficiency of stock markets depends on the ability of investors to adapt to changing market conditions. The AMH theory supports the existence of mispricing in stock markets due to investor biases and risk perceptions (Dhankar and Shankar 2016).

Urquhart and McGroarty (2016) argued that market conditions have a strong influence on the psychology of the market participants and their information processing behavior, which, in turn, impacts the returns. To prove their argument, the authors used the variance ratio test to examine the predictability of returns and found that it fluctuates over time in every market, stressing the fact that the concept of an efficient market does not exist.

Cognitive biases like herding and loss aversion may lead to deviations from rational market behavior and economic growth. Psychological biases, especially overconfidence, loss aversion, and herding behaviors, significantly affect investment decisions among Indian investors. Akin and Akin (2024) investigated stock market volatility in the context of behavioral finance and found that loss aversion and sentiments negatively impact stock markets, whereas herding behavior and optimism have a positive influence.

In addition, socio-demographic factors like gender, income, and education level play a role in shaping investor behavior (Patel 2023). Individual investors' cognitive biases play a significant role in their investment decision-making behavior. Rationality has a significantly negative relationship with self-attribution bias and overconfidence bias (Mushinada and Veluri 2019). Cognitive biases like confirmation bias, loss aversion, and the illusion of control significantly influence investment decisions (Kiruthika and Ramya 2023). Investors exhibit momentum and contrarian biases in evaluating technical analysis signals (Zielonka et al. 2020).

The relevant literature in indexed peer-reviewed journals is scarce. Table 1 summarizes other relevant articles from the literature.

Table 1. Relevant articles from the literature.

SN	Title	Findings	Research Gap
1	Don't Fight the Tape! Technical Analysis Momentum and Contrarian Signals as Common Cognitive Biases. (Zielonka et al. 2020)	• Investors exhibit momentum and contrarian biases in evaluating technical analysis signals. • The disposition effect influences investors' beliefs in technical analysis signals.	• Lack of analysis on the reasons why investors continue to use TA despite its doubtful effectiveness. • Future research could explore the psychological and behavioral factors that drive investors to use technical analysis despite its doubtful effectiveness.
2	Cognitive Bias Factors Influencing Investors' Investment Decisions in Behavioral Finance Perception. (Kiruthika and Ramya 2023)	• Cognitive biases like confirmation bias, loss aversion, and the illusion of control significantly influence investment decisions.	• The study examined only five cognitive bias factors, leaving room to investigate other factors influencing investors' decision-making. • The sample size was relatively small, and increasing it could provide more robust results.
3	A Study on Influences of Psychological Biases on Investment Decisions of Indian Investors (Patel 2023)	• Psychological biases, especially overconfidence, loss aversion, and herding behaviors, significantly affect investment decisions among Indian investors. • Socio-demographic factors like gender, income, and education level play a role in shaping investor behavior.	• The sample size may not be representative of the entire Indian investor population. • The study addressed only three psychological biases and did not consider other factors that may influence investor behavior.
4	Elucidating Investors Rationality and Behavioral Biases in Indian Stock Market (Mushinada and Veluri 2019)	• Individual investors' cognitive biases play a significant role in their investment decision-making behavior. • Rationality has a significantly negative relationship with self-attribution bias and overconfidence bias. • Male investors exhibit higher levels of overconfidence bias than female investors.	• The study relies on a self-report questionnaire to collect subjective information from individual investors, which may be subject to social desirability bias and limit the generalizability of the findings.
5	Do Investors Exhibit Cognitive Biases: Evidence from Indian Equity (Sharma and Firoz 2020)	• Investors exhibit behavioral biases such as optimism bias, herding, mental accounting, and disposition effect. • These biases significantly affect their rational decision-making process.	• The study has a small sample size and an overemphasis on quantitative data. A qualitative study can supplement this study to provide insights into the underlying reasons for the observed behavioral biases and their impact on investment decision-making.

3. Materials and Methods

The primary objective of this study is to investigate the behavioral factors that contribute to market volatility and the divergence between market movements and the underlying economic fundamentals. This study combines theoretical analysis with empirical modeling techniques in order to identify evidence to support its propositions.

3.1. Data

Table 2 below describes the variables used in the study.

Table 2. Variables.

SN	Variable	Description (Dataset for the Period of April 2006 to March 2024)
1.	GDPUS	Monthly percentage GDP growth in the United States.
2.	SPX	Monthly closing price of the S&P 500 index.
3.	GDPGB	Monthly percentage GDP growth in the United Kingdom.
4	UKX	Monthly closing price of the FTSE 100 index.
5	GDPIN	Monthly percentage GDP growth in India.
6	NIFTY	Monthly closing price of the Nifty 50 index.
7	GDPUS_T	Min–max transformed GDPUS.
8	SPX_SR_T	Min–max transformed standardized residual of SPX based on eGARCH (2,1) and ARFIMA (3,0,1).
9	GDPGB_T	Min–max transformed GDPGB.
10	UKX_SR_T	Min–max transformed standardized residual of UKX based on eGARCH (2,1) and ARFIMA (3,0,1).
11	GDPIN_T	Min–max transformed GDPIN.
12	NIFTY_SR_T	Min–max transformed standardized residual of NIFTY based on eGARCH (2,1) and ARFIMA (3,0,1).

The study relied on data for the variables obtained from Bloomberg over the period from April 2006 to March 2024.

3.2. Methodology

The GARCH model was applied to the S&P 500 (SPX), FTSE 100 (UKX), and NIFY 50 (NIFTY) datasets. The desired results for model fit were obtained using the eGARCH specification (2,1), the exponential GARCH model with two lagged terms for the conditional variance and one lagged term for the conditional mean, and ARFIMA (3,0,1), the autoregressive fractional integrated moving average model, which includes three autoregressive terms, no differencing, and one moving average term. The model's output was presented in the form of plots, depicting the model fit (how well the model matched the actual data) and the standardized residuals (the differences between the actual data and the model's predictions). The standardized residuals were extracted from the model for SPX, UKX, and NIFTY, and min–max transformation was applied to obtain the min–max transformed standardized residuals SPX_SR_T, UKX_SR_T, and NIFTY_SR_T. Min–max transformation was also performed on GDP growth GDPUS, GDPGB, and GDPIN to obtain GDPUS_T, GDPGB_T, and GDPIN_T. The transformation was performed to aid the comparison between market volatility measured by the standardized residuals with GDP growth.

By comparing the volatility patterns observed across these datasets with the respective GDP growth, the study aimed to uncover insights into the interplay between market volatility and economic growth (Su et al. 2023). To achieve this, min–max transformed GDP growth (GDPUS_T, GDPGB_T, and GDPIN_T) was plotted against min–max transformed standardized residuals (SPX_SR_T, UKX_SR_T, and NIFTY_SR_T). The analysis sought to identify instances where market volatility diverged from the underlying economic fundamentals, as reflected in GDP growth, potentially due to the influence of the behavioral factors investigated using the propositions mentioned in Section 3.3.

The GARCH model was selected because it is widely used to model financial time-series data that exhibit volatility clustering, a common feature in market data. It allows us

to capture time-varying volatility, which is crucial when studying the relationship between market volatility and economic growth. We did not use conditional standard deviation because the GARCH model's conditional variance is more appropriate for capturing the persistence of shocks and volatility over time. We also visually identified the propositions P1, P2, and P3 based on min–max transformed GDP growth and min–max transformed GARCH standardized residuals that do not require the use of conditional standard deviation.

The methodology combined theoretical underpinnings from psychology and behavioral economics with quantitative modeling techniques to provide a comprehensive understanding of the drivers of market volatility (Ni et al. 2015). By juxtaposing investor behavior with empirical data analysis, the study aimed to shed light on the complex dynamics shaping financial markets and highlight the importance of a disciplined, long-term investment approach that accounts for both economic realities and psychological biases.

3.3. Propositions

The phenomenon of herd mentality among investors during periods of extreme market volatility is a critical factor influencing market dynamics. Psychological concepts reveal that factors such as anxiety and the need for social conformity drive investors to follow the majority opinion rather than conduct independent research. This herding behavior exacerbates price swings and disassociates market dynamics from economic realities (Christoffersen and Stæhr 2019).

P1: In periods of high market volatility, investors exhibit herding behavior, leading to exaggerated market movements that may not align with the underlying economic fundamentals.

The impact of confirmation bias on investor decision-making plays a significant role in shaping market volatility. This cognitive bias occurs when individuals prioritize information that supports their preconceived notions while disregarding contradictory evidence. In the context of investment choices, confirmation bias can lead to investment decisions that fail to accurately reflect the overall state of the economy, thereby contributing to market volatility (Sharma and Firoz 2020).

P2: Confirmation bias influences investor decisions, causing them to react more strongly to news or events that confirm their existing beliefs, amplifying market volatility even when GDP growth remains stable.

The concept of loss aversion highlights another cognitive factor influencing investor behavior. The behavioral economics principle indicates that individuals exhibit a stronger tendency to avoid losses than to achieve equivalent gains. Loss aversion can precipitate overreaction to short-term market fluctuations, resulting in temporary surges in volatility driven by impulsive selling or buying behavior (Cascão et al. 2023).

P3: Overreaction to short-term market fluctuations due to loss aversion results in temporary spikes or dips in market volatility, even if these fluctuations do not significantly impact long-term economic growth (GDP).

4. Results

As explained in Section 3.2, min–max transformed monthly percentage GDP growth (GDPUS_T, GDPGB_T, and GDPIN_T) was compared to min–max transformed standardized residuals (SPX_SR_T, UKX_SR_T, and NIFTY_SR_T), which were extracted from the GARCH model with eGARCH model specification (2,1) and ARFIMA (3,0,1) for the S&P 500 (SPX), FTSE 100 (UKX), and NIFTY 50 (NIFTY) datasets. The descriptive statistics are shown in Table 3.

The mean values indicate moderate average growth across the economies, with GDPIN_T showing the highest average at 0.655. In contrast, the standardized residuals exhibit greater average volatility, reflecting the heightened fluctuations in stock indices compared to GDP growth. The standard deviations reveal low variability in GDP growth rates (approximately 0.09 to 0.11), whereas the standardized residuals demonstrate higher volatility (ranging from 0.12 to 0.15). Notably, the kurtosis values for GDP growth rates (ranging from 11.52 to 21.6)

indicate a leptokurtic distribution, suggesting the presence of potential outliers, whereas the standardized residuals display more moderate kurtosis values, indicating a departure from normality. The skewness reveals a slight right skew for GDPUS_T and GDPGB_T, whereas GDPIN_T exhibits significant left skewness. These statistics highlight the stable nature of economic growth compared to the more volatile behavior of stock markets, underscoring the importance of investigating cognitive biases that may influence market dynamics.

Table 3. Descriptive statistics.

	GDPUS_T	SPX_SR_T	GDPGB_T	UKX_SR_T	GDPIN_T	NIFTY_SR_T
Mean	0.476962	0.509196	0.488426	0.601822	0.654952	0.669888
Standard Error	0.006324	0.010387	0.007315	0.010101	0.007112	0.007931
Median	0.482484	0.516874	0.502101	0.623942	0.667504	0.6651
Mode	0.496815	N/A *	0.506303	N/A *	0.692745	N/A *
Standard Deviation	0.09294	0.152653	0.10751	0.148457	0.104526	0.116556
Sample Variance	0.008638	0.023303	0.011558	0.02204	0.010926	0.013585
Kurtosis	21.5406	2.340556	11.52155	1.172003	21.60329	4.693334
Skewness	0.486687	−0.40639	0.042541	−0.67702	−3.18787	−0.72907
Range	1	1	1	1	1	1
Minimum	0	0	0	0	0	0
Maximum	1	1	1	1	1	1
Sum	103.0239	109.9864	105.5	129.9936	141.4696	144.6958
Count	216	216	216	216	216	216

* Mode for SPX_SR_T, UKX_SR_T, and NIFTY_SR_T cannot be calculated because of no repetitive values.

Since SPX_SR_T, UKX_SR_T, and NIFTY_SR_T are derived from the standardized residuals of the GARCH model applied to the S&P 500 (SPX), the FTSE 100 (UKX), and the NIFTY 50 (NIFTY), it is important to verify that the models are able to capture the volatility dynamics appropriately. Table 4 shows the GARCH model results for SPX, UKX, and NIFTY. The GARCH model fit vs. the standardized residuals is shown in Figure 1.

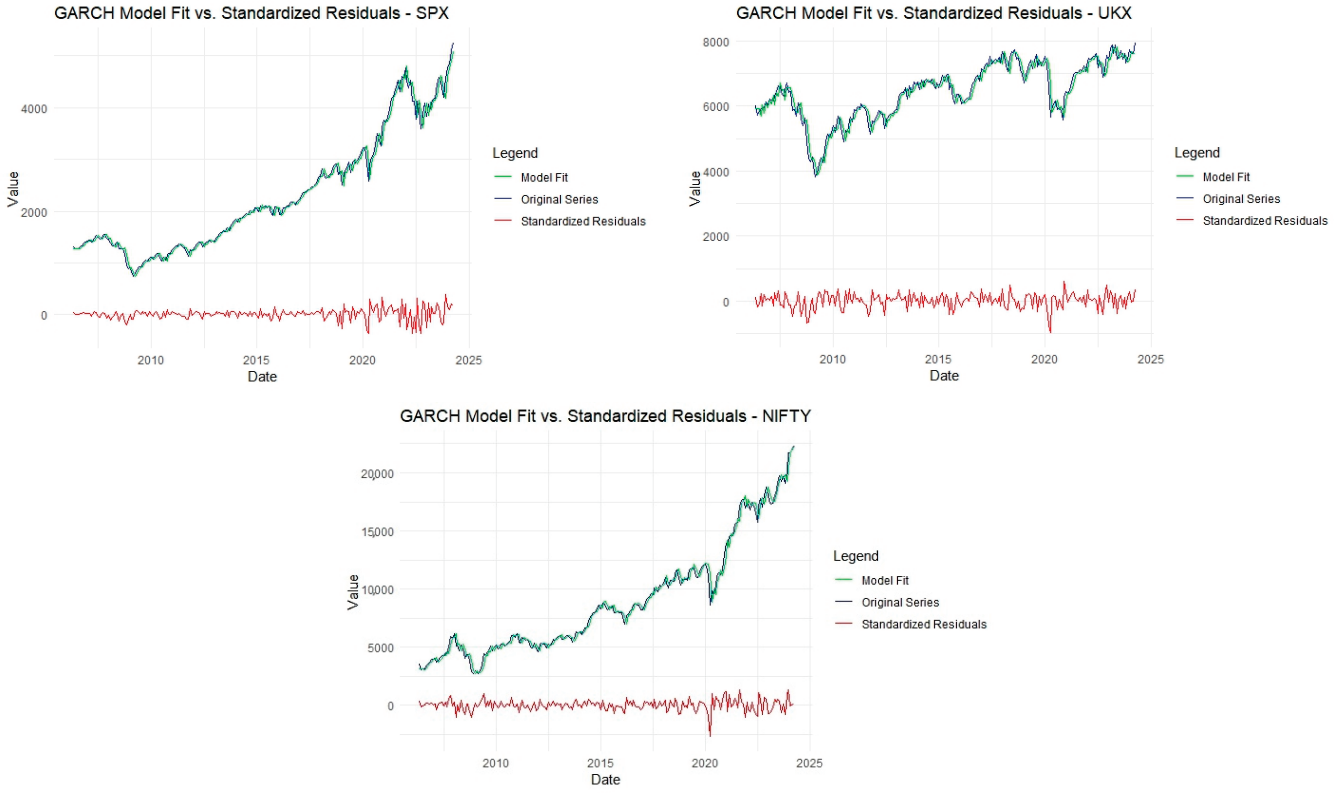


Figure 1. GARCH model fit vs. the standardized residuals of SPX, UKX, and NIFTY.

Table 4. GARCH model results.

	SPX				UKX				NIFTY			
	Estimate	**Std. Error**	***t*-Value**	***p*-Value**	**Estimate**	**Std. Error**	***t*-Value**	***p*-Value**	**Estimate**	**Std. Error**	***t*-Value**	***p*-Value**
mu	1269.74	4.89	259.64	0.00	5871.09	43.47	135.05	0.00	3170.36	103.79	30.54	0.00
ar1	0.02	0.04	0.36	0.72	−0.04	0.06	−0.69	0.49	0.01	0.00	2.17	0.03
ar2	0.96	0.02	62.27	0.00	0.94	0.02	48.30	0.00	0.91	0.01	93.82	0.00
ar3	0.03	0.05	0.69	0.49	0.07	0.06	1.10	0.27	0.11	0.01	14.09	0.00
ma1	1.00	0.00	496.34	0.00	1.00	0.00	68,823.23	0.00	0.96	0.01	66.00	0.00
omega	0.26	0.06	4.21	0.00	8.06	0.71	11.39	0.00	0.12	0.01	15.10	0.00
alpha1	−0.46	0.10	−4.71	0.00	−0.53	0.11	−4.96	0.00	−0.28	0.11	−2.65	0.01
alpha2	0.48	0.11	4.43	0.00	−0.16	0.12	−1.35	0.18	0.31	0.11	2.73	0.01
beta1	0.97	0.01	128.99	0.00	0.25	0.07	3.85	0.00	0.99	0.00	20,034.37	0.00
gamma1	0.12	0.15	0.85	0.40	−0.05	0.16	−0.29	0.77	0.60	0.16	3.63	0.00
gamma2	0.41	0.13	3.16	0.00	0.13	0.18	0.68	0.49	−0.45	0.16	−2.74	0.01

The GARCH model fit plots in Figure 1 for the SPX, UKX, and NIFTY indices illustrate the model's effectiveness in capturing the dynamics of each market. For SPX, the green line representing the GARCH model closely aligns with the blue line of the original series, indicating a strong fit. The standardized residuals, shown in red, fluctuate around zero, suggesting that the model successfully accounts for the volatility in returns. The absence of significant patterns in the residuals reinforces the adequacy of the model in reflecting market behavior, particularly during periods of heightened volatility.

Similarly, the UKX plot demonstrates a robust model fit, with the GARCH model effectively tracking the original series. The residuals remain consistently centered around zero, further validating the model's performance. In the case of NIFTY, the plot shows a strong alignment between the GARCH fit and the original series, especially during periods of market fluctuations. The standardized residuals again indicate that the model adequately captures the volatility dynamics, with no discernible patterns. These results confirm the suitability of the GARCH model for analyzing the volatility of these indices, thereby providing valuable insights into market behavior and the influence of cognitive biases on economic growth.

The GARCH model results for the SPX, UKX, and NIFTY indices underscore the model's suitability in capturing the complexities of financial market behavior. The parameters exhibit significant estimates, particularly for the autoregressive terms, with ar2 demonstrating a strong relationship across all indices, indicating the clear persistence of past values in influencing current returns. The moving average parameter (ma1) being consistently set at 1 further supports the model's robustness, suggesting an effective capture of the impact of past shocks on current volatility. Additionally, the omega parameter signifies a positive baseline level of volatility, whereas the GARCH parameters (alpha1 and beta1) reveal a persistent volatility structure, particularly evident in NIFTY, with a beta1 close to 1. This highlights the model's capacity to account for the inherent volatility dynamics in financial markets.

Therefore, the use of standardized residuals derived from this GARCH model is justified for further analysis. These standardized residuals provide a normalized measure of volatility, allowing for a clearer comparison between the fluctuations in market returns and the underlying economic growth indicator. By transforming the residuals, we eliminate any scale effects, enabling the examination of cognitive biases such as herding, confirmation bias, and loss aversion in the context of market volatility. This methodological approach enhances the validity of the analysis, as the standardized residuals accurately reflect the deviations from expected market behavior, providing critical insights into the interplay between cognitive biases and market dynamics. The GARCH model results validate its application, reinforcing the rationale for utilizing standardized residuals in the investigation of market volatility and investor behavior.

The diagnostic results shown in Table 5 for the GARCH model applied to the SPX, UKX, and NIFTY indices also demonstrate the model's robustness and suitability in capturing the volatility dynamics of these markets. The weighted Ljung–Box test results indicate no significant autocorrelation in the standardized residuals across all lags for each index, as evidenced by p-values well above the conventional significance level of 0.05. This lack of serial correlation suggests that the model has adequately captured the relationships

within the data, validating its fit. Also, the weighted ARCH LM tests show no significant evidence of heteroskedasticity, indicating that the model effectively accounts for volatility clustering, a common phenomenon in financial time series. The standardized residuals from the model provide a normalized measure of volatility, facilitating the analysis of cognitive biases and their impact on market behavior. Their distribution around zero without significant patterns provides a reliable basis for further analysis.

Table 5. Model diagnostics.

		SPX		UKX		NIFTY	
Test	**Lag**	**Statistic**	***p*-Value**	**Statistic**	***p*-Value**	**Statistic**	***p*-Value**
Weighted Ljung-Box Test	Lag[1]	0.9209	0.3372	0.439	0.5076	0.6754	0.4112
	Lag[2*(p+q)+(p+q)-1][11]	5.6977	0.6831	3.518	1.0000	3.2310	1.0000
	Lag[4*(p+q)+(p+q)-1][19]	11.4383	0.2562	5.774	0.9787	9.7351	0.5129
Weighted ARCH LM Tests	ARCH Lag[4]	1.388	0.2388	0.3023	0.5824	0.3629	0.5469
	ARCH Lag[6]	2.254	0.4373	2.8136	0.3365	0.4850	0.8962
	ARCH Lag[8]	2.757	0.5899	4.0131	0.3735	3.2171	0.5036

The Granger causality test results, shown in Table 6, indicate that volatility Granger-causes GDP growth in the SPX, UKX, and NIFTY indices. However, GDP growth does not Granger-cause volatility in any of the indices, highlighting the predictive nature of market fluctuations on economic performance across these markets.

Table 6. Granger causality test.

Series	**Causality Direction**	**F-Test**	***p*-Value**
SPX	Volatility does Granger-cause GDP_Growth	4.5545	0.01105
	GDP_Growth does not Granger-cause Volatility	0.0153	0.9848
UKX	Volatility does Granger-cause GDP_Growth	11.3880	1.53×10^{-5}
	GDP_Growth does not Granger-cause Volatility	1.0588	0.3478
NIFTY	Volatility does Granger-cause GDP_Growth	9.9916	5.777×10^{-5}
	GDP_Growth does not Granger-cause Volatility	0.2028	0.8165

5. Discussion

5.1. Market Volatility vs. Economic Growth

The following plots in Figures 2–4 for the S&P 500 (US), the FTSE 100 (UK), and the NIFTY 50 (India) depict the relationship between market volatility and GDP growth over time. The orange line represents the min–max transformed GARCH-standardized residuals (market volatility), and the blue line shows the min–max transformed GDP growth for each country. Key events are marked on the plots, highlighting the propositions (P1, P2, or P3) based on the events and details mentioned in Table 7.

To interpret this plot, we analyzed the patterns and deviations between the blue line of the min–max transformed GDP growth and the orange line of the min–max transformed GARCH-standardized residuals of the S&P 500, the FTSE 100, and the NIFTY 50. When the blue line exhibits stability or steady growth but the residual lines show significant fluctuations or volatility, it suggests a potential disconnect between market behavior and underlying economic fundamentals. The propositions were identified based on major global events, and, subsequently, the plot was interpreted. Table 7 summarizes the analysis.

The analysis of global market reactions to major geopolitical and economic events highlights significant differences between developed economies (the US and the UK) and a developing economy (India). As seen in the table, the propositions (P1, P2, and P3) vary across regions, indicating that investor behavior and market responses are shaped by distinct factors such as regional economic conditions, political stability, and investor sentiment. These differences provide valuable insights into how markets react to uncertainty and external shocks, as well as the influence of spillover effects across global markets.

Table 7. Summary of analysis.

Month (Identified from the Plot)	Event	Price Change (%)/Proposition (US—S&P 500)	Price Change (%)/Proposition (UK—FTSE 100)	Price Change (%)/Proposition (INDIA—NIFTY 50)	Explanation
October 2008	2008 Global Financial Crisis	−16.94%/P3	−10.71%/P3	−26.41%/P3	Loss aversion (P3) is evident across all regions, as investors overreacted to the financial crisis, triggering significant price drops. Despite the sharp declines in market prices, GDP growth was already on a downturn. Market volatility amplified the fear of economic downturn beyond the fundamentals.
December 2008	2008 Mumbai Attacks (India)	0.78%/P1	3.75%/P1	7.41%/P1	The herding behavior (P1) after the Mumbai attacks shows that despite the attacks being localized to India, all three regions exhibited a collective market reaction. The sharp price changes reflect heightened market volatility not aligned with GDP fundamentals but rather driven by fear and geopolitical risks.
May 2009	2009 Indian General Elections	5.3%/P3	4.11%/P3	28.07%/P1	Herding behavior (P1) in India led to an exaggerated price rise as investors speculated on political outcomes. In the US and the UK, despite a positive price change, the reaction reflects loss aversion (P3), with markets cautiously recovering, even though GDP growth remained stable post-elections.
October 2011	2011 Eurozone Debt Crisis	10.77%/P1	8.11%/P2	7.76%/ P1	Despite ongoing concerns about the Eurozone, markets reacted positively in October 2011 due to optimism surrounding bailout agreements and coordinated policy actions to stabilize the region. Herding behavior (P1) in the US and India drove market gains, whereas confirmation bias (P2) in the UK reflected relief from policy interventions.
May 2014	2014 Modi Government in India	2.1%/P2	0.95%/P2	7.97%/P2	Across all three markets, confirmation bias (P2) prevailed, as investors reacted optimistically to the anticipated pro-business policies of the new Indian government. Despite relatively stable GDP growth, the market movements were driven more by sentiment and expectations than by economic fundamentals.
October 2015	2015 Paris Climate Agreement	8.3%/P2	4.94%/P2	1.47%/P2	In all regions, confirmation bias (P2) drove market volatility, as investors speculated on the long-term impact of climate change policies. Despite this significant policy event, GDP growth remained stable, and the market reaction was based on expectations rather than immediate economic changes.
July 2016	2016 Brexit Vote (UK)	3.56%/P2	3.38%/P2	4.23%/P2	The Brexit vote caused volatility across global markets, driven by confirmation bias (P2), as investors reacted to the uncertainty surrounding the UK's departure from the EU. Despite GDP growth not being immediately affected, the markets anticipated long-term economic disruptions, leading to increased volatility.
November 2016	2016 US Presidential Election (Trump)	3.48%/P2	−2.45%/P3	−4.65%/P3	In the US, confirmation bias (P2) led to a positive market reaction, as investors speculated on Trump's pro-business policies. However, in the UK and India, loss aversion (P3) drove volatility, as investors reacted negatively to the political uncertainty and potential global economic implications.
August 2019	2019 India Revokes Article 370	−1.81%/P3	−5%/P3	−0.85%/4.09% (September) P3/P1	Loss aversion (P3) prevailed in the US, the UK, and India in August, as investors overreacted to the political risks posed by Article 370. However, in India, herding behavior (P1) took over in September, leading to a market rebound as investors speculated on the longer-term effects of the decision on the economy.
March 2020	COVID-19 Pandemic (2020)	−12.51%/ P1 & P3	−13.81%/ P1 & P3	−23.25%/ P1 & P3	The COVID-19 pandemic led to sharp declines in all markets driven by herding behavior (P1) and loss aversion (P3), as investors globally panicked. The immediate price drops were much larger than warranted by GDP declines, indicating an exaggerated reaction to the uncertainty posed by the pandemic.
March 2022	Russia–Ukraine War (2022)	3.58%/P1	0.77%/P3	3.99%/P1	Herding behavior (P1) is observed in the US and India, as investors reacted strongly to the geopolitical uncertainty caused by the war. In the UK, loss aversion (P3) is evident, as investors were more risk-averse, reflecting concerns about energy prices and the broader economic impact of the conflict.
September 2022	2022 Inflation and Energy Crisis	−9.34%/P3	−5.36%/P3	−3.74%/P3	Across all three regions, loss aversion (P3) dominates as investors overreact to rising inflation and energy crises, driving significant price declines. Despite the short-term market volatility, the long-term GDP impact remained limited, indicating an exaggerated market reaction to these events.
April 2023	2023 India Overtakes China's Population	1.46%/P3	3.13%/P3	4.06%/P2	In the US and the UK, loss aversion (P3) caused moderate market volatility, as investors speculated on the global economic implications of India's population growth. In India, confirmation bias (P2) drove the market reaction, as investors viewed the demographic shift positively, anticipating long-term economic benefits.

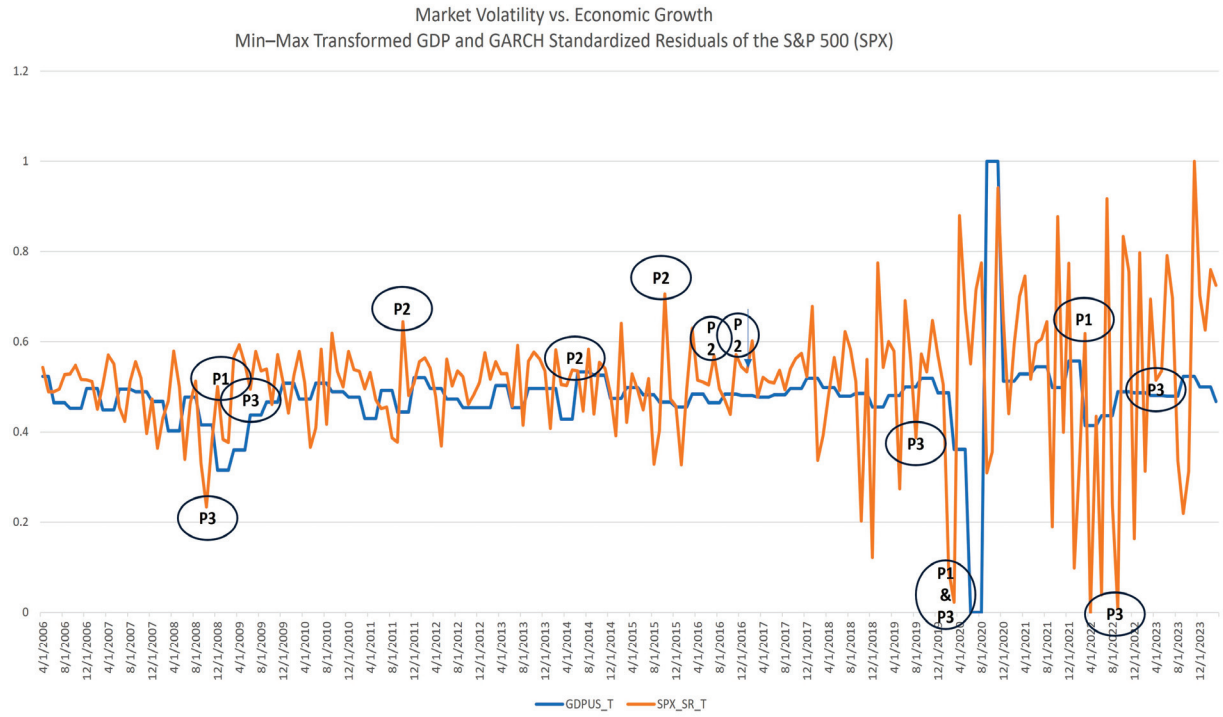


Figure 2. Market volatility vs. economic growth (US).

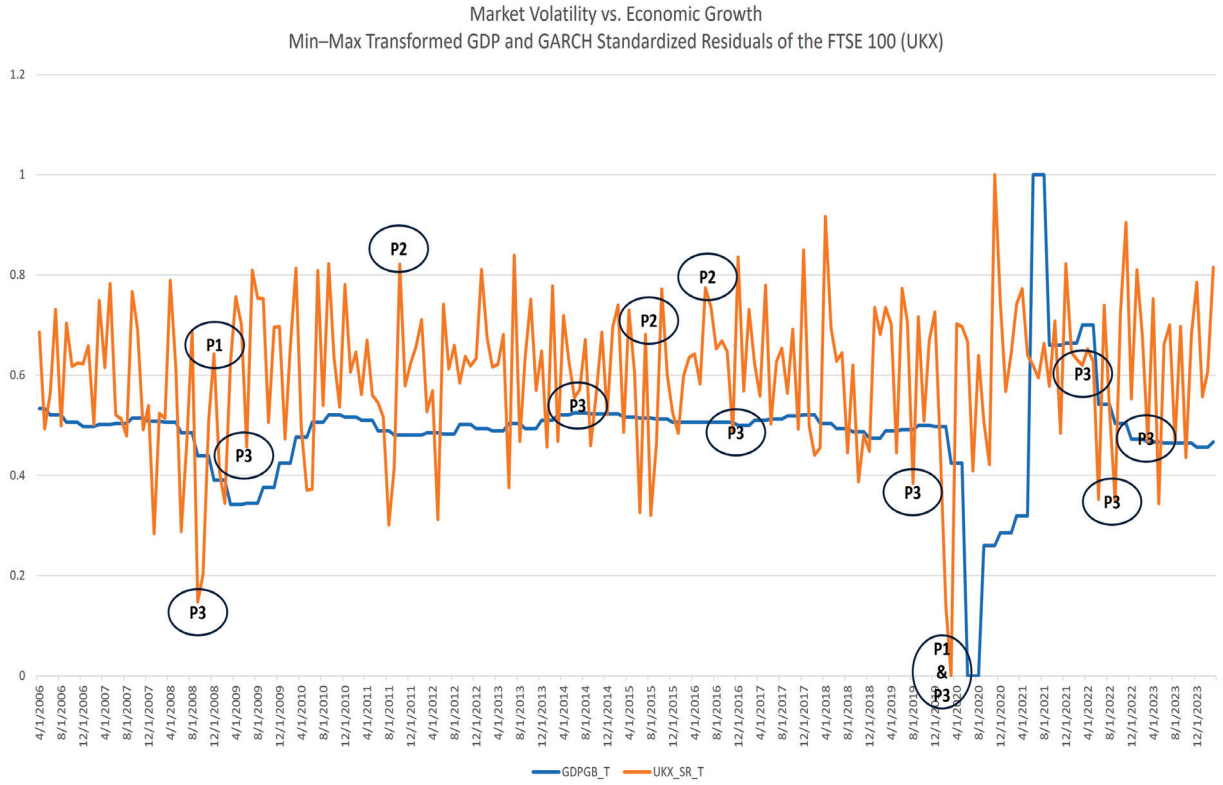


Figure 3. Market volatility vs. economic growth (UK).

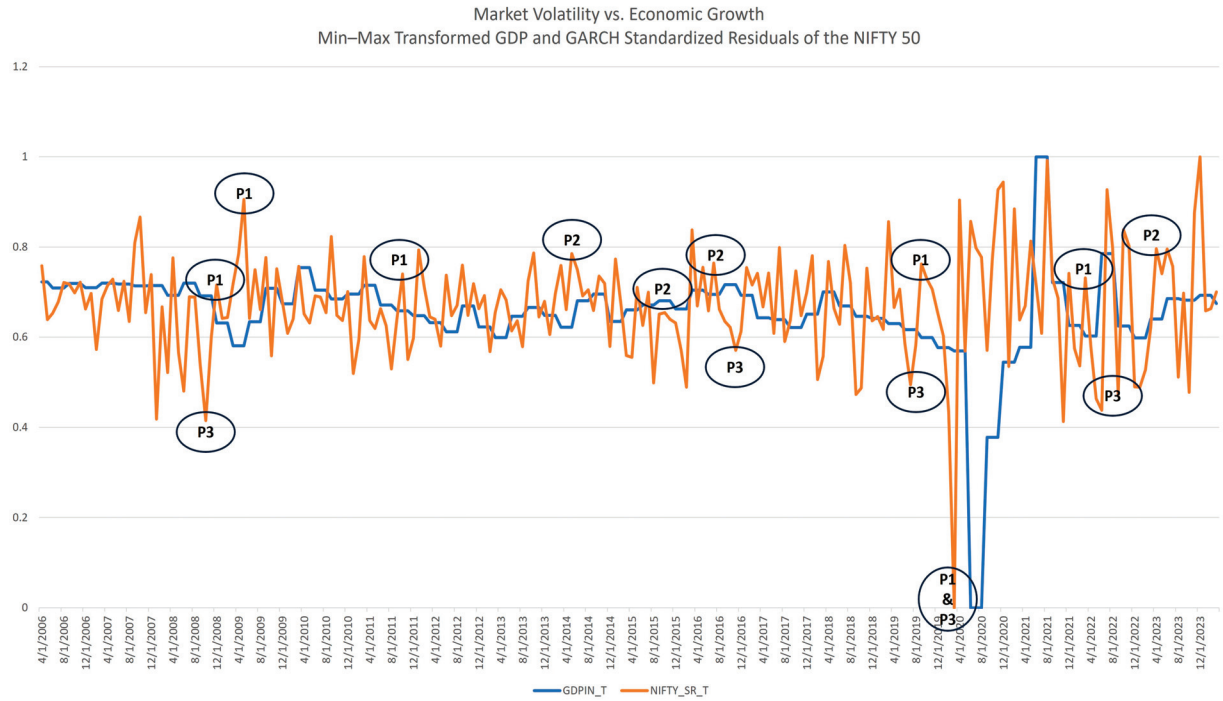


Figure 4. Market volatility vs. economic growth (India).

One clear pattern is that during major global crises, such as the 2008 global financial crisis and the COVID-19 pandemic, loss aversion (P3) dominated across all regions. In these instances, investors in both developed and developing economies overreacted to short-term fluctuations, leading to sharp declines in market prices. For example, during the 2008 crisis, market prices in the US, the UK, and India dropped by 16.94%, 10.71%, and 26.41%, respectively. This behavior shows that in times of global uncertainty, the spillover effect manifests as a global flight to safety, where markets collectively panic, amplifying volatility far beyond what GDP figures alone would suggest.

However, regional differences are evident in how markets react to more localized political or economic events. For instance, during the 2009 Indian general elections, herding behavior (P1) drove an exaggerated 28.07% rise in the NIFTY 50, whereas markets in the US and the UK exhibited more tempered reactions driven by loss aversion (P3), reflecting cautious optimism. Similarly, in the case of the 2014 Modi government in India, confirmation bias (P2) played a significant role across all markets, as investors anticipated pro-business reforms. This optimism was largely driven by expectations rather than immediate economic changes, demonstrating how sentiment can significantly impact market movements in both developed and developing economies.

In contrast, global events like the 2011 Eurozone debt crisis and the 2016 Brexit vote produced more varied market responses, depending on regional proximity and perceived risk. During the Eurozone debt crisis, the US and Indian markets exhibited herding behavior (P1), as investors responded to fears of contagion. In the UK, however, confirmation bias (P2) was more prominent, as investors anticipated a negative impact on the UK economy, despite stable GDP growth. Similarly, the Brexit vote caused volatility across global markets, driven by confirmation bias (P2), as investors in all regions reacted to the uncertainty surrounding the UK's departure from the EU. This event highlights how the spillover effect can cause markets to react differently depending on their perceived exposure to the event.

It is also important to note that during events such as the 2016 US presidential election and the Russia–Ukraine war in 2022, the reactions were region-specific. In the US, confirmation bias (P2) led to positive market movements, as investors speculated on pro-business policies under Trump. In contrast, markets in the UK and India exhibited loss aversion (P3), as investors reacted negatively to political uncertainty and its potential global implications.

Similarly, during the Russia–Ukraine war, herding behavior (P1) drove market movements in the US and India, whereas in the UK, loss aversion (P3) reflected concerns about energy prices and broader economic risks.

The analysis reveals that although global events often produce interconnected market responses, the specific investor behavior—whether driven by herding, confirmation bias, or loss aversion—varies between developed and developing economies. These regional differences are shaped by local economic conditions, the political context, and investor sentiment. Also, the spillover effect is not uniform but rather reflects the way global events influence markets based on their regional proximity and the perceived risks.

The Granger causality test results further deepen our understanding of the relationship between market volatility and GDP growth, particularly within the context of developed and developing economies. The finding that volatility Granger-causes GDP growth across all three indices—SPX, UKX, and NIFTY—supports the notion that fluctuations in financial markets act as leading indicators of economic performance. This is especially important when considering the differing investor behaviors identified in the table. For example, during events like the 2008 global financial crisis and the 2020 COVID-19 pandemic, herding behavior (P1) and loss aversion (P3) amplified market volatility, which, in turn, significantly influenced economic outcomes. The fact that GDP growth does not Granger-cause volatility reinforces the idea that economic performance is more reactive to market dynamics than vice versa. In developed markets like the US and the UK, this suggests that investor sentiment and cognitive biases—such as confirmation bias (P2) during the 2016 Brexit vote and the 2016 US presidential election—play a key role in shaping economic expectations. Similarly, in India, where herding behavior (P1) often drives market movements during political transitions, the Granger causality test underlines the importance of monitoring volatility as a predictive tool for economic planning. These results emphasize the need for both policymakers and investors to consider market volatility not just as a reflection of current economic conditions but as a potential predictor of future economic growth influenced by the underlying behavioral dynamics of the market.

5.2. Summary and Discussion

The analysis of market volatility and economic growth through the GARCH models and the interpretation of the graphical representations strongly support the three propositions proposed in this study.

P1 (herding behavior): The GARCH model results and the market volatility vs. economic growth plot clearly demonstrate instances where market movements deviated significantly from the underlying economic fundamentals. This divergence can be explained by the presence of herding behavior among investors, as indicated in P1. During periods of high uncertainty or market turbulence, investors tend to follow the crowd rather than make independent decisions based on rational analysis, leading to exaggerated market swings (McFadden and Lusk 2015).

P2 (confirmation bias): The analysis also supports the proposition that confirmation bias plays a role in amplifying market volatility. Investors tend to prioritize information that aligns with their existing beliefs, ignoring contradictory evidence or economic data. This selective perception can cause investors to overreact to news or events that confirm their biases, leading to market movements that are disconnected from the underlying economic fundamentals.

P3 (loss aversion): The plot and the interpretation table provide evidence of temporary spikes or dips in market volatility, even when long-term economic growth remained relatively stable. These short-term fluctuations can be attributed to loss aversion, as indicated in P3. Investors' tendency to avoid losses can lead to impulsive selling or buying behavior, resulting in heightened market volatility that is not necessarily reflective of the overall economic conditions.

Therefore, our analysis supports all three propositions, P1, P2, and P3, highlighting the significant impact of cognitive biases and behavioral factors on market volatility and its

relationship with economic growth. These findings underscore the importance of considering psychological aspects in investment decision-making and developing strategies to mitigate the influence of cognitive biases on market dynamics.

6. Conclusions

This study has implications for investors, policymakers, economic analysts, and regulators. Investors need to be aware of the significant impact of behavioral biases such as herding behavior, confirmation bias, and loss aversion on their investment decisions. Recognizing these psychological factors can help investors develop strategies, such as diversification, risk management techniques, and a long-term investment approach, aligned with economic fundamentals rather than short-term market sentiments. This will help investors mitigate the influence of cognitive biases.

Policymakers should consider the role of behavioral biases in market volatility and implement measures to promote market stability, such as investor education programs and clear communication about economic policies and data. Regulations and interventions should aim to address the impact of cognitive biases on investor behavior, potentially including circuit breakers, trade halts, and measures to encourage rational decision-making.

Economic analysts should incorporate insights from behavioral finance and historical market data into their forecasting models and analyses to better predict and understand the complex interplay between market behavior and economic fundamentals. By considering the psychological factors that influence market dynamics, analysts can provide more accurate investment advice and economic forecasts, contributing to a more resilient financial ecosystem.

Regulators can draw insights from the findings of the study to develop effective investor protection measures, such as educational initiatives and transparency measures, that address cognitive biases and promote informed decision-making. Understanding the impact of behavioral biases on market stability, regulators can implement targeted policies and surveillance protocols to identify and mitigate potential market disruptions caused by irrational investor behavior.

The role of other potential psychological factors and individual characteristics that could influence investment decisions and market behavior should be investigated further. The generalizability of the results should be examined by replicating the study in different market contexts.

This study aimed to investigate the behavioral factors that contribute to market volatility and the divergence between market movements and the underlying economic fundamentals. By combining theoretical analysis and empirical modeling techniques, the study has achieved its objectives and provided valuable insights into the complex interplay between investor behavior, market dynamics, and economic growth.

The analysis strongly supports the proposed propositions, highlighting the significant impact of cognitive biases and behavioral factors on market volatility. Herding behavior (P1) was found to lead to exaggerated market swings, with investors following the crowd rather than making rational decisions based on economic fundamentals. Confirmation bias (P2) caused investors to overreact to information that aligned with their existing beliefs, amplifying market movements even in the face of stable economic conditions. Additionally, loss aversion (P3) prompted impulsive selling or buying behavior, resulting in temporary volatility spikes or dips that did not reflect long-term economic trends.

The GARCH models effectively captured the time-varying nature of volatility in financial time series. Moreover, the graphical representations and interpretation tables provided visual evidence of instances where market behavior deviated from underlying economic fundamentals. These findings underscore the importance of considering psychological aspects in investment decision-making and developing strategies to mitigate the influence of cognitive biases on market dynamics.

The study is constrained by a limited scope of variables, focusing primarily on herding behavior, confirmation bias, and loss aversion while ignoring other psychological

biases such as overconfidence and anchoring bias. Also, the analysis did not account for demographic attributes that could influence market behavior, potentially limiting the understanding of overall investor psychology. The geographical focus on three countries—the US, the UK, and India—may lead to biased results, especially since India is classified as a developing economy. Future studies may benefit from including a broader range of developing or Asian countries to enhance comparability and generalizability. The time frame of April 2006 to March 2024 may limit the applicability of the results to different economic cycles. Finally, the reliance on historical data and specific model specifications, while robust, introduces potential limitations in capturing all the dynamics of market behavior. These factors present avenues for further exploration to enrich the understanding of cognitive biases and their implications in financial markets.

Future research directions:

1. Exploring the role of other potential psychological factors and individual characteristics that could influence investment decisions and market behavior, such as overconfidence, anchoring bias, or risk perception.
2. Investigating the impact of investor demographics, education levels, and cultural factors on the prevalence and manifestation of cognitive biases in different market contexts.
3. Conducting field studies and longitudinal analyses to examine the relationship between risk tolerance, herding behavior, and market outcomes in real-world investment scenarios.
4. Expanding the research scope to include a broader range of financial instruments, asset classes, and market environments to assess the generalizability of the findings.
5. Incorporating qualitative data and analysis techniques to provide deeper insights into the underlying reasons for observed behavioral biases and their impact on investment decision-making processes.

By addressing these research gaps and leveraging interdisciplinary approaches, future studies can contribute to a more comprehensive understanding of the complex dynamics shaping financial markets. Ultimately, this knowledge can inform the development of effective strategies and policies aimed at fostering market stability, investor protection, and the alignment of investment decisions with economic realities.

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The Asymmetric Effects of Oil Price Volatility on Stock Returns: Evidence from Ho Chi Minh Stock Exchange

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Abstract: This study is the first to investigate the asymmetric effects of oil price volatility on stock returns for the Ho Chi Minh Stock Exchange (HOSE). We utilized weekly series of VN30-Index, WTI crude oil prices, geopolitical risks (GPR) index, and gold prices spanning from 6 February 2012 to 31 December 2023 as data sources. Using a nonlinear autoregressive distributed lag (NARDL) bounds testing approach, we found that, in the shortterm, oil price volatility has negative asymmetric effects on market returns. Specifically, in the shortterm, a 1 percent increase in oil price volatility immediately leads to a 2.6868 percent decrease in the market returns, while a similar magnitude decrease in oil price volatility is associated with a 6.3180 percent increase in the market returns. In addition, the results obtained from the NARDL model indicated that, in the longterm, the negative and positive changes of oil price volatility have significantly negative effects on the market returns. Finally, the findings derived from the error correction model (ECM) show that a 98.21 percent deviation from the equilibrium level in the previous week is converged and corrected back to the long-term equilibrium in the current week.

Keywords: HOSE; market returns; NARDL; oil price volatility

JEL Classification: E44; G12; G41

1. Introduction

Since the beginning of the industrial age, hydrocarbons have played an ever more critical role in civilization's development. In the 1800s, coal was the dominant source of energy for the propulsion of ships and trains, as well as for electricity generation for an ever more integrated global economy. In the early 1900s, following the introduction of the internal combustion engine, oil took over as the dominant energy source for the planet, currently accounting for nearly one-third of the globe's total energy consumption. This led to the greatest scramble for natural resources ever, as countries and companies sought to acquire reliable supplies of the critical black gold that powers their economies. Oil is an essential life blood of economic prosperity and wellbeing, especially as the planet's population has grown because of increasing food production, fueling global trade and transportation that moves people and materials from one side of the planet to the other, often in a matter of days or even hours.

Clearly, people's economic prosperity is directly tied to such a critical natural resource. Movements in prices tied to supply and demand dynamics ripple through economies, substantially hurting the prospects of oil-dependent economies, while greatly enhancing the wealth of oil-providing economies like those in the Middle East. Oil drives up the prices of all goods in the economy through production and transportation costs, thus increasing inflation and, in turn, interest rates for oil-dependent economies. These economic drags or windfalls related to oil price movements reverberate through economies and, in turn, their stock markets, having both negative and positive benefits depending on a country's

relative production and consumption. In addition, the stock market plays an important role in economic development for each country. Deep and broad financial market development has been shown to have a positive impact on the economic growth of countries (Asteriou and Spanos 2019; Kapaya 2020; Bhattarai et al. 2021). Therefore, the effects of oil prices and oil price volatility on stock returns have attracted considerable attention from scholars in the last decades. However, the existing literature has provided mixed evidence on the effect of oil price volatility on stock returns. Specifically, most of the studies have reported negative effects of oil prices volatility on stock returns (Diaz et al. 2016; Raza et al. 2016; Joo and Park 2017; Luo and Qin 2017; Xiao et al. 2018; Joo and Park 2021; Rahman 2021), while some empirical studies have found positive influences of oil price volatility on stock market returns (Joo and Park 2021; Chen et al. 2017; Raza et al. 2016). It is important to stress that the empirical studies have mostly focused on the U.S. and other oil-importing developed countries and less on developing countries. In addition, most of these studies have assumed that the impact of oil price volatility on stock returns is symmetric. However, the impact of oil price volatility on stock returns could be asymmetric, meaning that an increase in oil price volatility has a different effect on stock returns compared to a decrease in oil price volatility of the same magnitude.

Vietnam, a transition economy well on the path to emerging-market status, is critically dependent on oil imports to fuel its economic machine, especially considering that domestic production has fallen over the last decade. In 2022, Vietnam's oil consumption was about 515,000 barrels per day, while the oil production of the country was only around 194,000 barrels, meaning that Vietnam had to import approximately 321,000 a day (Nguyen 2024). Therefore, oil price movements could impact the Vietnam stock market. Although the effects of oil price changes and oil price volatility have been substantially documented in the literature, to our best knowledge, no study on these effects has been found for the Ho Chi Minh Stock Exchange (HOSE). To fill the gap in the literature, this study is devoted to investigating the effects of oil price volatility on stock returns for the HOSE. The contributions of the study to the literature are as follows. First, this study provides unique insights into the literature covering the effects of oil price volatility on stock returns in a transitional economy due to the fact that the Vietnamese economy has been in a transitional period with growing consumption of oil and deep integration into the world economy. Therefore, it is expected that the effect of oil price volatility on stock returns will be more pronounced in the Vietnam stock market. Second, while most studies on this topic investigate the symmetric effects of oil price volatility on stock returns, this study focuses on the asymmetric effects of oil price volatility on stock returns. It is important to note that the HOSE is characterized by a large number of small individual investors (Truong et al. 2021). Therefore, the response of investors in the market to oil prices could be asymmetric. The key hypothesis of the study is that oil price volatility has negative asymmetric effects on stock returns for the HOSE. This hypothesis is tested by using the NARDL bounds testing approach. The main finding of this study is that oil price volatility has negative asymmetric effects on the market returns. This paper is ordered as follows. Section 2 provides the theoretical background underpinning our analysis, as well as a review of the relevant literature on the topic. Section 3 contains a description of the data and the methodology employed in this analysis, while Section 4 provides the empirical results. Conclusions are drawn in Section 5.

2. Theoretical Background and Empirical Literature Review

The cashflow theory can be utilized as a theoretical framework to explain the impact of oil prices on returns of financial equities. Generally, according to the cashflow theory, financial equities value is equal to the present value of anticipated cash flows. Based on this theory, oil prices could have negative or positive effects on stock returns (Smyth and Narayan 2018). On the one hand, the negative effects of oil prices on stock returns could be justified in two ways. First, because oil is used as an essential input for most companies, an increase in oil prices leads to an increase in production costs; hence, future cash flows

decrease. Second, an increase in oil prices can result in an increase in expected inflation; thus, nominal interest rates increase. Financial experts use interest rates as discount rates to determine the value of stocks. Therefore, higher interest rates lead to lower stock returns. On the other hand, oil prices could have a positive impact on stock returns. A possible reason to explain this effect is that investors could positively respond to increasing oil prices because higher oil prices are associated with greater economic growth and the stronger performance of firms (Kollias et al. 2013). Furthermore, oil price volatility could have negative effects on stock returns because oil price volatility can positively influence the risk premium component of the discount rate used in the equity pricing model. Therefore, higher oil price volatility is associated with higher discount rates and lower stock returns.

In earlier empirical studies in this field, researchers mainly investigated the effects of oil prices on stock returns for specific countries or groups of countries (Smyth and Narayan 2018). The findings from these studies did not reach a consensus. Specifically, most of studies found negative effects of oil prices on stock returns (Jones and Kaul 1996; Gjerde and Sættem 1999; Sadorsky 1999; Papapetrou 2001; Basher and Sadorsky 2006; Park and Ratti 2008; Driesprong et al. 2008; Chen 2010; Filis 2010; Basher et al. 2012; Raza et al. 2016). In contrast, others reported positive influences of oil prices on stock returns (Narayan and Narayan 2010; Zhu et al. 2011; Zhu et al. 2014; Bouri 2015; Raza et al. 2016; Silvapulle et al. 2017; Luo and Qin 2017; de Jesus et al. 2020). Some researchers documented that oil prices have asymmetric effects on stock returns (Bahmani-Oskooee et al. 2019; Jiang and Liu 2021).

Recently, some empirical studies have focused on the effects of oil price volatility on stock returns. Most of them have focused on developed countries. Specifically, Rahman (2021) investigated the impact of oil price volatility on U.S. stock market returns from 1973 to 2015. The researcher found that oil price volatility has a significantly negative effect on the market returns. In addition, Diaz et al. (2016) determined the relationship between oil price volatility and stock market returns in the G7 countries during the period from 1970 to 2014. Using a vector autoregressive model, they found a negative effect of oil price volatility on stock market returns. Similarly, Joo and Park (2017) estimated the effects of stock and oil price uncertainty measured by conditional variance on oil returns and stock market returns for the United States, Japan, Korea, and Hong Kong during the period from 1996 to 2015. Using the VAR-DCC-BGARCH-in-mean approach, they reported that oil price volatility has a significantly negative impact on the market returns for the United States, Japan, and Hong Kong. In a later study, Joo and Park (2021) investigated the effects of oil price volatility on stock market returns for 10 major oil-importing countries. In their analysis, they considered China, France, Germany, India, Italy, Japan, Korea, the Netherlands, Spain, and the United States from May 2001 to December 2019. They found that oil price volatility has asymmetric effects on stock returns. Specifically, oil price volatility has a negative effect on stock returns in the case that both oil price volatility and stock returns are low. However, when oil price volatility is low and stock market returns are high, oil price volatility has a positive effect on stock returns. As the world's largest importer of crude oil, China has been the focus of investigations of the effects of oil price volatility on Chinese stock market returns. Specifically, Luo and Qin (2017) examined the effects of oil price volatility on Chinese stock market returns from 10 May 2007 to 31 December 2015. In that study, they used the crude oil volatility index (OVX) and realized a variance in the oil price volatility. In their findings, they confirmed that the oil price volatility has significantly negative effects on the market returns. In addition, Xiao et al. (2018) investigated the asymmetric effects of oil price volatility, measured by the crude oil volatility index, on Chinese stock returns from 10 May 2007 to 20September 2017. They found that the oil price volatility has a significantly negative asymmetric impact on Chinese stock returns in a bearish market. Specifically, the effects of positive changes in oil price volatility on the stock returns are larger than the effects of the negative changes. Moreover, Chen et al. (2017) examined the predictive ability of oil returns and oil return volatility on stock market momentum in the same market. They found that oil price volatility and stock market momentum are positively correlated. Raza et al. (2016) also examined the long-term and short-term asymmetric effects of gold

prices, oil prices, and gold and oil price volatilities on market returns. In their analysis, they considered emerging stock markets, such as those in China, India, Brazil, Russia, South Africa, Mexico, Malaysia, Thailand, Chile, and Indonesia. Using monthly data from January 2008 to June 2015, the empirical findings derived from a nonlinear autoregressive distributed lag (NARDL) approach indicated several trends. In the short run, negative changes in oil price volatility had a negative impact on stock returns in the Indian, South African, Malaysian, Thai, Chilean, and Indonesian markets. At the same time, positive changes in oil price volatility had a positive effect on the stock returns of the Chinese and South African stock markets. In addition, the researchers documented that, in the long run, oil price volatility has a asymmetric negative impact on the market returns of all emerging stock markets.

Furthermore, some researchers have investigated the relation between oil price volatility and stock return volatility. Specifically, Anand et al. (2014) explored the volatility spillover between oil prices and Indian stock market returns from January 2000 to December 2012. The researchers documented that oil price volatility has positive spillover effects on the volatility of market returns, but the market return volatility did not impact oil price volatility. In addition, Dutta et al. (2017) examined the effects of oil price volatility on the stock return volatility of the Middle Eastern and African stock markets from 10 May 2007 to 31 December 2014. Using an extended GARCH model, their empirical results revealed that oil market volatility has significant positive effects on the market return volatility of most studied markets. Sarwar et al. (2020) also investigated the volatility spillover between oil prices and stock returns for Pakistan, China, and India from 1997 to 2014. Using the bivariate BEKK-GARCH model, they found that oil price volatility has negative spillover effects on the volatility of market returns for all markets.

In summary, theoretically, oil price changes could have negative or positive effects on stock returns, while oil price volatility could have negative effects on stock returns. In the last decades, researchers have extensively documented the effects of oil price changes and oil price volatility on stock returns. However, scholars have not come to a consensus. Specifically, most researchers have reported negative effects of oil prices on stock returns, while others have indicated positive influences of oil prices on stock market returns. In addition, using empirical research, most researchers have documented that oil price volatility has negative effects on stock returns. Especially, some provide evidence that oil price volatility has asymmetric effects on stock returns. Based on this theoretical framework and empirical evidence, we hypothesized that oil price volatility has negative asymmetric effects on stock returns for the HOSE.

3. Data and Methodology

3.1. Data Sources

The data used in this study comprise the weekly series of VN30-Index, oil prices (WTI crude oil), geopolitical risks (GPR) index, and gold prices from 6 February 2012 to 31 December 2023. It is important to note that the VN30-Index, which was officially launched on6 February 2012, is a market-capitalization-weighted index calculated from 30 big capitalization and high liquidity stocks traded on the HOSE. The GPR index is the index developed by Caldara and Iacoviello (2022). These series are collected on Wednesdays. The choice of Wednesday aims to avoid the weekend effects of stock trading and to minimize the number of holidays (Huber 1997). Table 1 includes the specific data sources.

Table 1. Data sources of the study.

Data	Data Source
VN30-Index	Investing.com (https://www.investing.com, accessed on 30 January 2024)
Oil prices	Investing.com (https://www.investing.com, accessed on 15 January 2024)
GPR index	Caldara and Iacoviello's website (https://www.matteoiacoviello.com, accessed on 15 January 2024)
Gold prices	Investing.com (https://www.investing.com, accessed on 15 January 2024)

3.2. Research Methodology

To investigate the asymmetric effects of oil price volatility on stock returns for the HOSE, we use the following baseline regression model:

$$R_t = \beta_0 + \beta_1 VOL_t + LNGPR_t + LNG_t + \varepsilon_t \quad (1)$$

where R_t: market return of week t. The weekly market returns are calculated by the following equation:

$$R_t = Log(I_t) - Log(I_{t-1}) \quad (2)$$

where:

- I_t: VN30-Index at week t;
- I_{t-1}: VN30-Index at week $t-1$;
- VOL_t: oil price volatility at week t generated from a GARCH(1,1) model. In this study, the GARCH(1,1) takes the following form:

$$\begin{array}{l} LNOP_t = \alpha_0 + \alpha_1 LNOP_{t-1} + \varepsilon_t \;\; \varepsilon_t \approx N(0, h_t) \\ h_t = \omega + \delta h_{t-1} + \gamma \varepsilon_{t-1}^2 \end{array} \quad (3)$$

where:

- $LNOP_t$: natural logarithm of oil price at week t;
- $LNOP_{t-1}$: natural logarithm of oil price at week $t-1$;
- $LNGPR_t$: natural logarithm of the GPR Index at week t;
- LNG_t: natural logarithm of gold price at week t.

We employ the NARDL bounds testing approach proposed by Shin et al. (2014) to investigate the short-term and long-term asymmetric effects of oil price volatility on the market returns. The approach is an extended model of the ARDL model developed by Pesaran et al. (2001). In this model, oil price volatility is decomposed in positive and negative partial sum series. It is important to note that the NARDL bound does not require all variables to be integrated in the same order. Instead, it only requires that the order of integration of all variables is less than 2 (Truong et al. 2024). Therefore, researchers should examine the order of integration of all variables before conducting the bounds test. In this study, we employ the ADF (augmented Dickey–Fuller) test to determine the order of integration of the studied variables. The ADF test takes the following form:

$$\Delta y_t = \alpha_0 + \beta y_{t-1} + \sum_{j=1}^{k} \delta_j \Delta y_{t-j} + \varepsilon_t \quad (4)$$

where Δ is first-difference operator.

Because the ADF test results are sensitive to the selection of the lag length (k), the Akaike information criterion (AIC) is used for choosing the optimal k of the ADF regression.

Moreover, the null hypothesis in the ADF test is the existence of a unit root (β = 0), and it is rejected if the ADF test statistic is larger than the critical value.

Before estimating the short-term and long-term effects of oil price volatility on the market returns, the NARDL bound test is applied in order to determine the cointegration between variables in the model. Specifically, the NARDL bound test used in this study takes the following equation:

$$\Delta R_t = \beta_0 + \sum_{i=1}^{q_1} \beta_{1i} \Delta R_{t-i} + \sum_{i=0}^{q_2} \beta_{2i} \Delta VOL^+_{t-i} + \sum_{i=0}^{q_3} \beta_{3i} \Delta VOL^-_{t-i} + \sum_{i=0}^{q_4} \beta_{4i} \Delta LNGPR_{t-i} + \sum_{i=0}^{q_5} \beta_{5i} \Delta LNG_{t-i} + \lambda_1 R_{t-1} + \lambda_2 VOL^+_{t-1} + \lambda_3 VOL^-_{t-1} + \lambda_4 LNGPR_{t-1} + \lambda_5 LNG_{t-1} + \varepsilon_t \quad (5)$$

where:

- Δ represents the first difference of the variables;
- The null hypothesis (H_0) of the NARDL bound test is $\lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = 0$ (no co-integration in the longterm between variables).

If the F-statistic calculated from the bounds test is larger than the critical value of the selected significance level, the null hypothesis is rejected, meaning that a long-term relationship (co-integration) between the variables exists in the model. If a long-term equilibrium relationship is detected, the short-term and long-term effects of the oil price volatility on the market returns are estimated by Equations (6) and (7), respectively.

$$\Delta R_t = \varphi_0 + \sum_{i=1}^{q_1} \varphi_{1i} \Delta R_{t-i} + \sum_{i=0}^{q_2} \varphi_{2i} \Delta VOL^+_{t-i} + \sum_{i=0}^{q_3} \varphi_{3i} \Delta VOL^-_{t-i} + \sum_{i=0}^{q_4} \varphi_{4i} \Delta LNGPR_{t-i} + \sum_{i=0}^{q_5} \varphi_{5i} \Delta LNG_{t-i} + \delta ECM_{t-1} + \varepsilon_t \quad (6)$$

$$R_t = \beta_0 + \beta_1 R_{t-1} + \beta_2 VOL^+_{t-1} + \beta_3 VOL^-_{t-1} + \beta_4 LNGPR_{t-1} + \beta_5 LNG_{t-1} + \varepsilon_t \quad (7)$$

4. Empirical Results

4.1. Oil Price Volatility and Market Returns of the HOSE for the Period from 2012 to 2023

Table 2 includes the descriptive statistics of the oil price volatility and market returns of the HOSE from 1986 to 2021 based on the obtained data. It shows that the oil price volatility measured by the conditional variances of the GARCH(1,1) model ranges from 0.0001 to 0.0103 with a mean of 0.0005. Specifically, Figure 1 shows oil price volatility from 2012 to 2023 with four periods, namely the post-global-financial-crisis period (2012–2015), the U.S.–Saudi oil conflict and the U.S.–China trade conflict period (2016–2019), the COVID-19 crisis period (2020–2021), and the Russia–Ukraine war period (2022–2023). In the post-financial-crisis period from 2012 to 2015, oil price volatility showed a stable fluctuation amplitude due to post-crisis production. During the U.S.–Saudi oil conflict and the U.S.–China trade conflict between 2016 and 2019, there was great volatility in oil prices with a severe decline and bottoming out at 40% in 2018 from 2012. The reason was because Saudi Arabia sharply increased production under pressure from the U.S. and the U.S.–China trade conflict. The oil price volatility decreased by more than 10% in 2023 because of the COVID-19 pandemic from 2020 to 2021 that led to an oil demand decline. At the end of 2021, oil prices dropped because of the new variant of COVID-19 in South Africa with a high risk of infection.

Table 2. Summary statistics of oil prices volatility and market returns (2012–2023).

Variables	Observations	Minimum	Mean	Maximum	Standard Deviation
VOL	607	0.0001	0.0005	0.0103	0.0008
R	607	−0.0435	0.0006	0.0483	0.0118

Source: Own calculation on the data obtained from Investing.com.

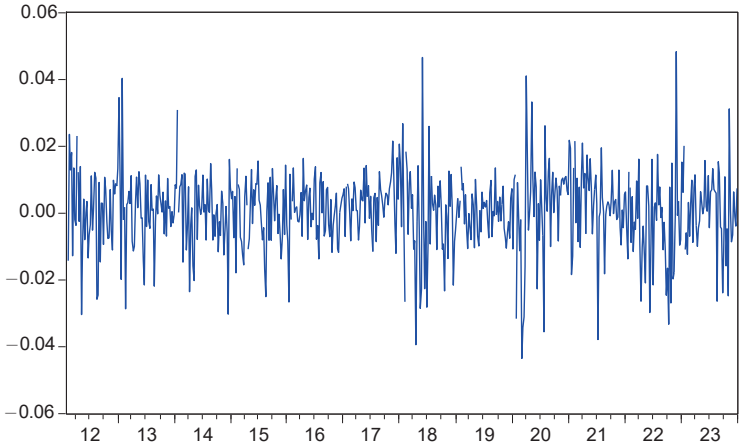


Figure 1. Oil prices volatility during the period 2012–2023. Source: Data generated from the GARCH(1,1) model of oil prices obtained from Investing.com.

Oil price volatility fluctuated strongly between 2022 and 2023 and reached the highest level of more than 45% in March 2022 from 2008. The Russia–Ukraine war and the G7 and its allied countries' imposing of sanctions on Russian sectors (banking, logistics, and energy) caused the volatility. After that, oil prices "slid" because of weak oil demand from China, central banks raising interest rates, and concerns about an economic recession. Toward the end of 2023, amid the oil price volatility, the annual price had slid since 2020, despite geopolitical risks and the ongoing Israeli–Hamas conflict in the Middle East.

Regarding market returns, we observed that the mean weekly market return for the studied period was 0.0006 with a standard deviation of 0.0118 (see Table 2). Figure 2 includes the market returns from 2012 to 2023 with three similar periods, like oil price volatility. First, market returns in the post-global-financial-crisis period fluctuated slightly and maintained positive low profits due to the TPP and FTA, expanding room for foreign investors. Second, market returns from 2016 to 2019 significantly rebounded and declined from April 2016 to December 2018, respectively. The undesirable impacts of negative events, such as the Chinese stock market interrupting trading, the UK leaving the EU, and the results of the U.S. presidential election, were the causes. From January to August 2019, market returns had a strong recovery due to the comprehensive restructuring of the stock market and the passage of a new security law. Third, market returns recovered spectacularly from 2021 to 2022. Fourth, market returns experienced multiple negative changes in the period 2022–2023, declining more than 33.6% compared to the peak on 10January 2022. The prolonged geopolitical tensions between Russia and Ukraine and between Israel and Hamas contributed to the negative effects.

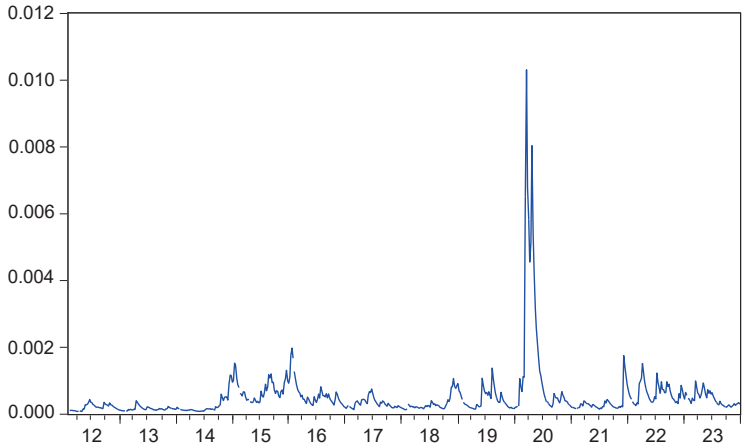


Figure 2. The market returns for the period 2012–2023. Source: Data were collected from Investing.com.

In summary, in 2012–2023, notable changes, such as the post-global-financial-crisis period, the U.S.–Saudi oil conflict, the U.S.–China trade conflict, the COVID-19 crisis, and the Russia–Ukraine war, significantly impacted oil price volatility and market returns. However, the oil price volatility and market yield changes have been reversing since 2023.

4.2. The Estimation of Oil Price Volatility

In this study, oil price volatility (conditional variance) is generated by using the GARCH(1,1) model. Table 3 includes a summary of results derived from the GARCH(1,1) model. The estimated values of the conditional variance equation (h_t) provide a series showingthe real oil price volatility. Specifically, the results of GARCH(1,1) reveal that the coefficients of ARCH (γ) and GARCH (δ) are significant at one level, and the sum of the two coefficients is less than one, indicating that the model is stationary.

Table 3. The results of the GARCH(1,1) model.

Variables	Coefficients	t-Statistics
Conditional mean equation		
α_0	0.02666	2.52 **
α_1	0.98617	174.59 ***
Observations	607	
Conditional variance equation		
ω	0.00003	4.49 ***
γ	0.75242	22.37 ***
δ	0.20103	7.33 ***

Note: *** and ** indicate significance at the 1% and 5% levels, respectively. Source: Own estimation on the data obtained from Investing.com and Caldara and Iacoviello's website.

4.3. Unit Root Tests

Before conducting the NARDL bound test for cointegration, we employed the ADF test to check whether the variables used in the model fulfil the stationary condition of the bound test. We performed for both cases of constant only and constant with time trend. Table 4 contains the results of the ADF test. The null hypothesis of a unit root is significantly rejected at the 1 percent level for the R and LNGPR series, meaning that these series are integrated to the order zero. In addition, the results of the ADF test reveal that the null hypothesis of a unit root cannot be rejected at the significant level of 5 percent for the VOL^+, VOL^-, and LNG series. However, when the test is applied for the first differences of these variables, the null hypothesis is significantly rejected at the 1 percent level. According to these findings, the VOL^+, VOL^-, and LNG series are integrated in order 1. With this evidence, we concluded that all the variables in the model fulfil the conditions of the NARDL bound test.

Table 4. Results of ADF unit root tests.

Variable	Constant without Trend	Constant with Trend
R		
Level	−23.17 *** (0)	−23.17 *** (0)
VOL^+		
Level	0.26 (7)	−2.18 (7)
First difference	−7.12 *** (6)	−7.18 *** (6)
VOL^-		
Level	0.61 (10)	−1.95 (10)
First difference	−6.51 ***(9)	−6.63 *** (9)
LNGPR		
Level	−8.30 *** (2)	−8.67 ***(2)
LNG		
Level	−0.94 (0)	−2.44 (0)
First difference	−25.07 ***(0)	−25.17 *** (0)

Note: *** indicates significance at the 1% level. The numbers in the parentheses represent the lag section based on AIC criteria. Source: Own estimation on the data obtained from Investing.com and Caldara and Iacoviello's website.

4.4. ARDL Bound Test for Cointegration

As discussed above, we employed the NARDL bound test proposed by Shin et al. (2014) to determine the cointegration between variables in the model. Based on the Akaike information criterion, the best model for the bounds test is ARDL (1,0,2,0,1). Table 5 contains the results of the bounds reported. According to these results, the null hypothesis of no cointegration among variables can be rejected at the significance level of 1 percent. The rejection of the null hypothesis means that there is a long-term equilibrium relationship between the market returns and the independent variables in the model. Therefore, the NARDL model can be employed to estimate the short-term and long-term coefficients of the model.

Table 5. Results of the bounds test.

Model	k	F-Statistic	Significance Level	Critical Value	
				Lower Bounds I(0)	Upper Bounds I(1)
NARDL (1,0,2,0,1)	4	115.40 ***	5%	2.86	4.01
			1%	3.74	5.06

Note: k indicates the number of regressors. *** represents significance at the 1% level. Source: Own estimation on the data obtained from Investing.com and Caldara and Iacoviello's website.

4.5. Short-Term and Long-Term Effects of Oil Price Volatility on Market Returns

With the evidence of a long-run equilibrium relationship between the market returns and the regressors, the short-term and long-term asymmetric effects of oil price volatility on the market returns are estimated by employing the NARDL (1,0,2,0,1) model. Table 6 has the summary of the estimated short-term and long-term coefficients of the NARDL model. In the shortterm, oil price volatility has significantly negative asymmetric effects on the market returns at the 5percent level. This means that the positive and negative changes in oil price volatility have different effects on the market returns. Specifically, a 1percent increase in oil price volatility immediately leads to a 2.6868 percent decrease in the market returns, while the same magnitude of decrease in oil price volatility is associated with a 6.3180 percent increase in the market returns. In addition, the short-term results indicate that the previous week's negative shocks in oil price volatility have a significantly negative effect on the market returns at the 1percent significance level. Specifically, a 1percent decrease in oil price volatility at the current week is associated with an 11.6117 percent increase in the market returns in the next week. However, according to the results summarized in Table 6, in the shortterm, the GPRs and gold prices have no effects on the market returns. Moreover, the coefficient-of-error correction term is -0.9821 and is statistically significant at the 1percent level, implying that 98.21 percent of the disequilibria from the previous week converged and corrected back to the long-run equilibrium in the current week.

In the longterm, the estimated results confirm that both the negative and positive changes in oil price volatility have significantly negative effects on the market returns at the 1percent level. Specifically, in the longterm, a 1percent increase in oil price volatility is associated with a 2.7358 percent decrease in the market returns, while a 1percent decrease in the oil price volatility results in a 2.7298 percent increase in the market returns. In addition, the results of the NARDL model indicate that in the longterm, the GPRs have a significantly negative effect on the market returns at the 5percent level. Specifically, in the longterm, a 1percent increase in the GPRs index leads to a 0.0077 percent decrease in the HOSE's returns. However, in the longterm, gold prices have no significant effects on the market returns.

The overall finding of this study is that oil price volatility has negative asymmetric effects on market returns for the HOSE. This evidence is in line with previous findings by Diaz et al. (2016), Joo and Park (2017), Joo and Park (2021), Luo and Qin (2017), Rahman (2021), and Xiao et al. (2018). The negative effects of oil price volatility on the market returns of the HOSE could be explained by other reasons. First, oil price volatility could deteriorate

economic activities. Therefore, it has a negative effect on the expected returns of stocks. In addition, oil price volatility can be seen as a systematic stock risk. Therefore, higher oil price volatility is associated with higher discount rates. According to the cashflow theory, higher oil price volatility leads to lower stock returns. Moreover, according to results of the error correction model, 98.21 percent of the disequilibria from the previous week converges and corrects back to the long-run equilibrium in the current week. The adjustment speed in this case is very high, meaning that the system quickly reverts to the long-term equilibrium after a short-term shock.

Table 6. Estimated short-term and long-term coefficients of the NARDL model.

Variables	Coefficients	t-Statistic
Panel A: The estimated short-term coefficients		
ΔVOL^{+}	−2.6868	−3.66 ***
ΔVOL^{-}	−6.3180	−2.00 **
$\Delta VOL^{-}(-1)$	−11.6117	−4.50 ***
$\Delta LNGPR$	−0.0019	−0.66
ΔLNG	0.0036	0.38
ECM(−1)	−0.9821	−24.18 ***
Panel B: The estimated long-term coefficients		
Constant	0.0046	0.14
VOL^{+}	−2.7358	−3.72 ***
VOL^{-}	−2.7298	−3.67 ***
LNGPR	−0.0077	−2.30 **
LNG	−0.0037	−0.38

Note: *** and ** indicate significance at the 1% and 5% levels, respectively. Source: Own estimation on the data obtained from Investing.com and Caldara and Iacoviello's website.

4.6. Diagnostic Tests for the ARDL Model

We used the diagnostic tests of Breusch–Godfrey for serial correlation and ARCH (autoregressive conditionally heteroscedastic) for heteroscedasticity to check the validity and reliability of the estimated results from the NARDL approach. Table 7 includes the results of the Breusch–Godfrey and ARCH tests. According to these results, the null hypothesis of no serial correlation in the model at the significance level of 5percent cannot be rejected, meaning that serial correlation is not present in the residuals. Moreover, according to the results of the ARCH test, we cannot reject the null hypothesis of no ARCH effects at the significance level of 5 percent. This evidence implies that the residuals of the model are homoscedasticity. These diagnostic tests ensure the reliability and validity of the estimated results.

Table 7. Results of Breusch–Godfrey and ARCH tests.

Diagnostic Test	Statistics	*p*-Value	Conclusions
Autocorrelation (Breusch–Godfrey test) H_0: No serial correlation	1.38	0.24	Fail to reject H_0
Heteroscedasticity (ARCH test) H_0: No ARCH effects	1.02	0.31	Fail to reject H_0

Source: Own estimation on the data obtained from Investing.com and Caldara and Iacoviello's website.

4.7. Structural Stability Tests

We need to check the stability of the estimated coefficients because the NARDL approach is sensitive to structural breaks, while the studied variables are sensitive to global events. In this study, we used the cumulative sum of the recursive residuals (CUSUM) and the cumulative sum of squared recursive residuals (CUSUMSQ) tests proposed by Brown et al. (1975) to investigate the long-term stability of the coefficients in the model. Figures 3 and 4 include the results of the tests. According to these findings, the plots of

the CUSUM and CUSUMSQ lines are within the critical bounds at the 5percent level of significance. These results indicate that the model is stable over the sample period.

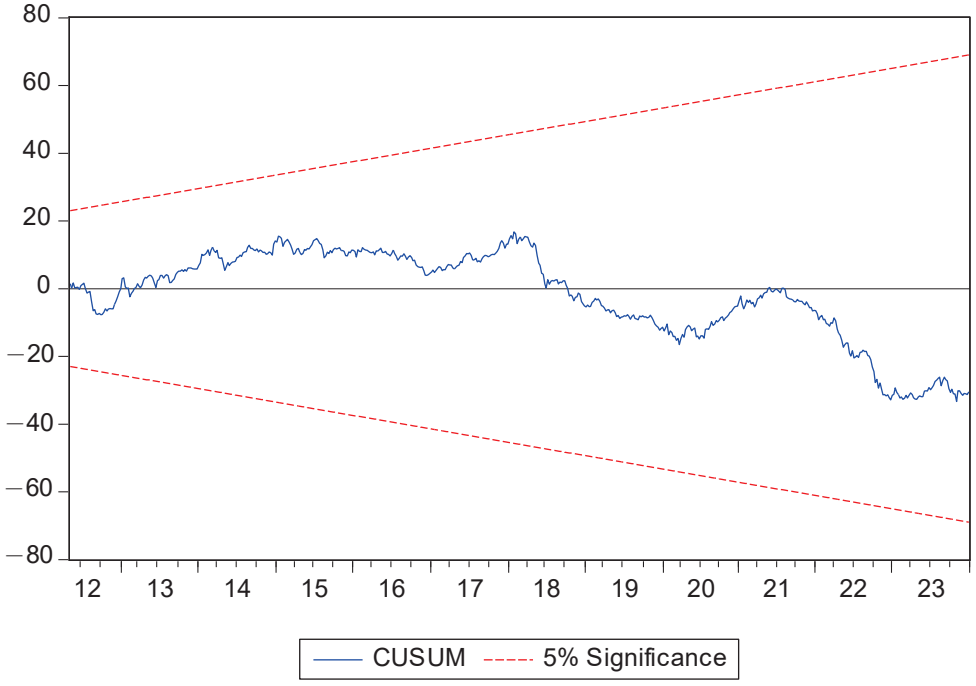


Figure 3. Plots of cumulative sum of recursive residuals.

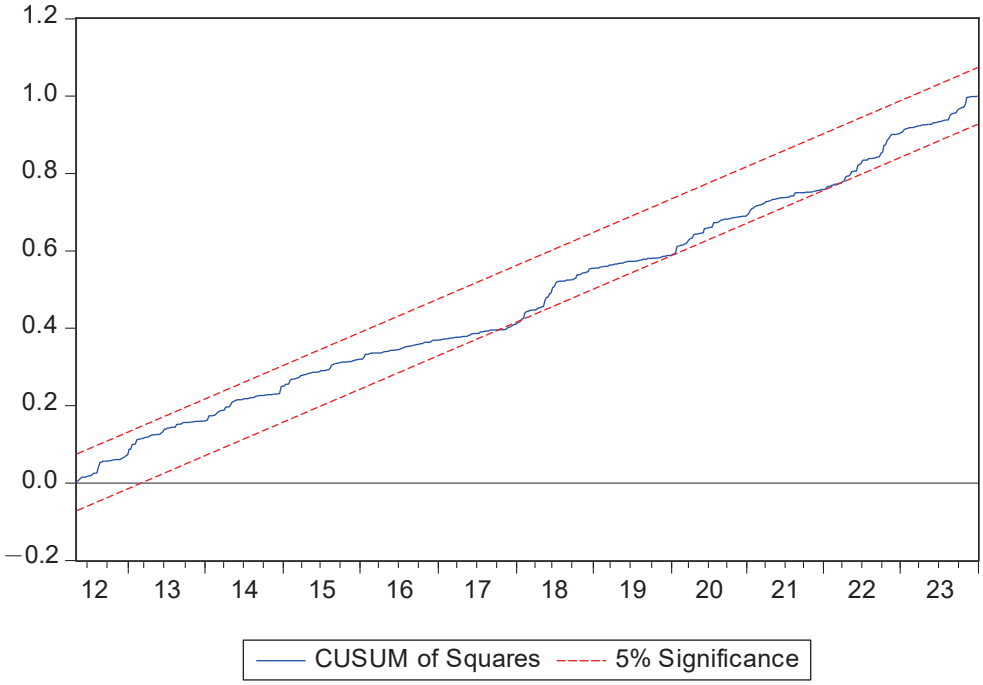


Figure 4. Plots of cumulative sum squares of recursive residuals.

5. Conclusions

We sought to investigate the asymmetric effects of oil price volatility on stock returns for the HOSE, a frontier stock market, from 6 February 2012 to 31 December 2023. Using the NARDL bounds testing approach, the empirical results indicate that oil price volatility has negative asymmetric effects on the market returns in both the shortterm and longterm. This means that positive and negative changes in oil price volatility have different impacts

on market returns. Specifically, in the shortterm, a 1 percent increase in oil price volatility immediately leads to a 2.6868 percent decrease in the market returns, while a 1percent decrease in oil price volatility is associated with a 6.3180 percent increase in market returns. In the longterm, a 1 percent increase in oil price volatility is associated with a 2.7358 percent decrease in market returns. Similarly, a 1 percent decrease in oil price volatility is associated with a 2.7298 percent increase in market returns. In addition, the results of the NARDL model indicate that the GPRs have no effect on the market returns in the shortterm but has a significantly negative effect on the market returns in the longterm. Moreover, this study does not find any evidence for the relationship between gold prices and market returns. Finally, the results of the error correction model confirm that 98.21 percent of the disequilibria from the previous week converges and corrects back to the long-run equilibrium in the current week. The findings of this study imply that the HOSE is capturing the effects of oil price volatility on various economic activities. Therefore, financial experts could use oil price fluctuation to forecast the future economics. Based on this implication, we propose that investors in frontier markets utilize oil price volatility to predict stock returns and establish effective hedging strategies.

Although this study's findings add to and enhance people's knowledge about the effects of oil price volatility on stock returns in a frontier stock market, the study has limitations that researchers need to address in future empirical studies. First, we only examined the effects of oil price volatility on the aggregative stock market returns. However, the effects of oil price volatility on stock returns differ among industries. Therefore, researchers could focus on the effects of oil price volatility on stock returns at the industry level. Second, a single country analysis is another limitation of the study that could be addressed in future studies. Finally, in this study, we investigated the effects of oil price volatility on stock returns without considering the moderating effect of the COVID-19 pandemic. This limitation could be an interesting topic for further research.

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Is Globalization Coming to an End Due to the Rise in Income Inequality?

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Abstract: The reversal of the trend towards the decline in income inequality in the last four decades in most countries has created favorable grounds for the rise of nationalist and anti-globalization sentiments. Economic failures of countries, groups of people and individuals are among important factors that cause nationalism. The rise of nationalism in many countries in recent decades, as measured by the decline in the "pride in your own country" indicator from the World Values Survey, is statistically significantly related to the change in income inequality (Gini coefficient) within the country. When globalization is properly managed, it is good for growth and income distribution and does not lead to nationalism. But if it is accompanied by the decline in real incomes for large masses of people, nationalist political forces have additional arguments for instigating anti-globalization and isolationist sentiments. The rise in income inequality within major countries since the 1980s poses a threat not only to social stability, but also to globalization.

Keywords: inequality; globalization; nationalism; growth; pride in one's country

1. Introduction

"Patriotism is when love of your own people comes first; nationalism, when hate for people other than your own comes first". This famous statement by Charles de Gaulle may be confusing when trying to distinguish between "good" and "bad" nationalism. Love and hate are emotional categories and do not help to evaluate policy actions and particular measures of authorities providing preferential treatment to a particular group of people—citizens of a country or one of the ethnic groups within the country (affirmative action).

When are such policies justified and when are they not? When are they regarded as patriotism and when are they considered nationalism/chauvinism? The logical answer in the first approximation would depend on the relative position of the country/minority group versus other countries/groups: if a nation/group is behind the others, and especially if it was disadvantaged in the past, preferential treatment is fully justified. But if this nation/group is ahead of the others, providing preferences to this entity at the expense of the other groups would be seen as unfair. Nationalism is the ideology of expanding the rights of the particular ethnic group or country—if this expansion is intended to overcome lagging behind and to catch up with other more privileged groups or countries, it is perceived as fair. If it is aimed at gaining superiority, it is seen as unfair.

To cite a couple of examples, most Western nations provide economic assistance to all developing countries and give preferential access to their markets (low or no tariffs) to the Least Developed Countries (LDCs), whereas many developing countries retain higher

trade barriers than developed countries—most economists justify such a policy on the grounds that it helps poor countries to catch up with rich countries. By the same token, special assistance to less developed regions and disadvantaged groups is a basic principle of most countries and international associations, the EU included.

Of course, there are many real and imaginary reasons why a nation may feel disadvantaged—it may be a victim of aggression or colonialism, may be unhappy with its position in international arena, etc. Here, however, I look only at real (not perceived) economic reasons of nationalism. To be more precise, this paper tries to explain the rise of nationalism in many Western countries in the last four decades by the change in income distribution. The hypothesis is that trends in nationalism are explained by both between-country and within-country inequality. If the gains from globalization are distributed evenly, the public is willing to embrace it, but if the gains are appropriated by few, it is easy for nationalist political forces to turn the public against globalization.

Hence, there are several types of globalization models, depending on the trend in inter- and intra-country inequality in the last four decades:

- Great gains from globalization for the country as a whole and a relatively small rise in within-country inequality (Japan, China, some European countries);
- Small gains from globalization for the country as a whole, but a decline in domestic inequality (some Latin American countries, including Brazil);
- Large gains from globalization for the country as a whole, but an increase in domestic inequality (Britain);
- Small gains from globalization for the country as a whole and a high level of domestic inequality (the US, Latin American countries, Russia in the 1990s).

The worst conditions for the rise of nationalism would be in the first group of countries, the best in the last, fourth group, with the second and third group falling in between.

It is certainly true that the rise of nationalism may be caused by a variety of reasons that are not associated with the economic success and change in income and inequality. A nation may feel humiliated after a lost war or after unfair treatment by other countries and the international community, or there may be a propaganda machine at work to create a feeling of superiority over other nationalities—all these reasons are **not** analyzed in this paper. The goal of this paper is quite modest—it is to show that a considerable portion of the dynamics of nationalist sentiments in recent decades is explained by the change in between- and within-country inequality.

The first section discusses the dynamics of income inequality within countries as a possible cause of the rise of nationalism (and the increase in immigration as a possible alternative explanation). **The second section** provides empirical evidence—data and regressions—linking the dynamics of the pride (in one's country) indices with income inequality. **The third section** examines three case studies—the US, the EU and Russia. **The forth section** concludes this paper.

2. Nationalism and Inequality Within Countries

Conservative politicians all over the world have recently spoken against globalization. As former French Prime Minister Dominique De Villepin put it recently, "globalization has created political, economic and cultural interdependences that led to facilitate cooperation, on the one side, and to spread fear and violence all around the world on the other side: instead of creating closer links and dialogue, globalization led to new kinds of exclusion, isolation and radicalization" (https://www.cpifa.org/en/cms/book/182; accessed on 25 February 2025). And Donald Trump spoke in favor of "Americanism, not globalism" (http://www.realclearpolitics.com/video/2016/07/21/trump_nominated_we

_will_honor_the_american_people_with_the_truth_and_nothing_else.html; accessed on 25 February 2025).

It would be wrong, however, to blame globalization for all the disasters and misfortunes, from non-growing real incomes to the rise of nationalism. As Mark Twain said, history does not repeat itself, but it rhymes. Those who blame globalization today for economic and social misfortunes are similar to the Luddites of the 19th century who believed that the use of machines leads to rising unemployment and falling wages.

There are cases when globalization works and leads to rising incomes among the masses. Theoretically, greater international flows of goods, ideas, technology, capital and labor should increase productivity, but in reality, this happens only if these flows are carefully managed.

Why was greater economic interaction with the world in some countries accompanied in recent decades by rising incomes and its relatively even distribution (China and other East Asian countries[1]), while modest growth of income coupled with rising inequality left large masses of the population worse off in other countries (many Western countries, including the US, Eastern Europe and former Soviet Union)? The answer is that policy matters a great deal and many good policies that allow benefits from globalization are often non-orthodox and counterintuitive (Polterovich & Popov, 2005). If globalization is accompanied by the increase in income and wealth inequality within countries, gains from globalization are appropriated by the few better off, whereas the masses receive nothing or very little, so it is only too easy for the interested political forces to blame globalization for the negative developments.

The central argument of this paper is that the reversal of the previous trend towards the decline in income inequality in the last four decades in most countries created favorable grounds for the rise of nationalist and anti-globalization sentiments. Lindert and Williamson (2016) claim that income inequality breeds populism and attributes the rise in inequality to globalization (especially in the two periods of American history—the Gilded Age of the late 1800s and the last four decades since the 1980s). This paper argues that income inequality indeed contributes to the rise of populism and nationalism, but that globalization does not necessarily lead to a rise in inequality.

Looking at the recent dynamics of income and wealth inequality from a longer-term perspective, it is easy to notice that the last four decades are quite unique. Secular trends suggest increasing inequality from the ancient times before reaching an all-time peak in the early 20th century (Table 1, Figure 1), and then declining inequality after the First World War and the 1917 Russian revolution before the new rise since the 1980s (Piketty, 2014; Jomo & Popov, 2016).

Table 1. Gini coefficients of income distribution in selected countries since the 1st century, %.

Years	14	1000	1290	1550	1700	1750	1800	2000
Rome	39							
Byzantine		41						
Holland				56		63	57	30.9
England			36.7		55.6	52.2	59.3	37.4
Old Castille/Spain						52.5		34.7
Kingdom of Naples/Italy							28.1	35.9
France							55	33

Source: Milanovic et al. (2007, 2011); data for 2000 are sometimes from the (World Development Indicators Database, n.d.).

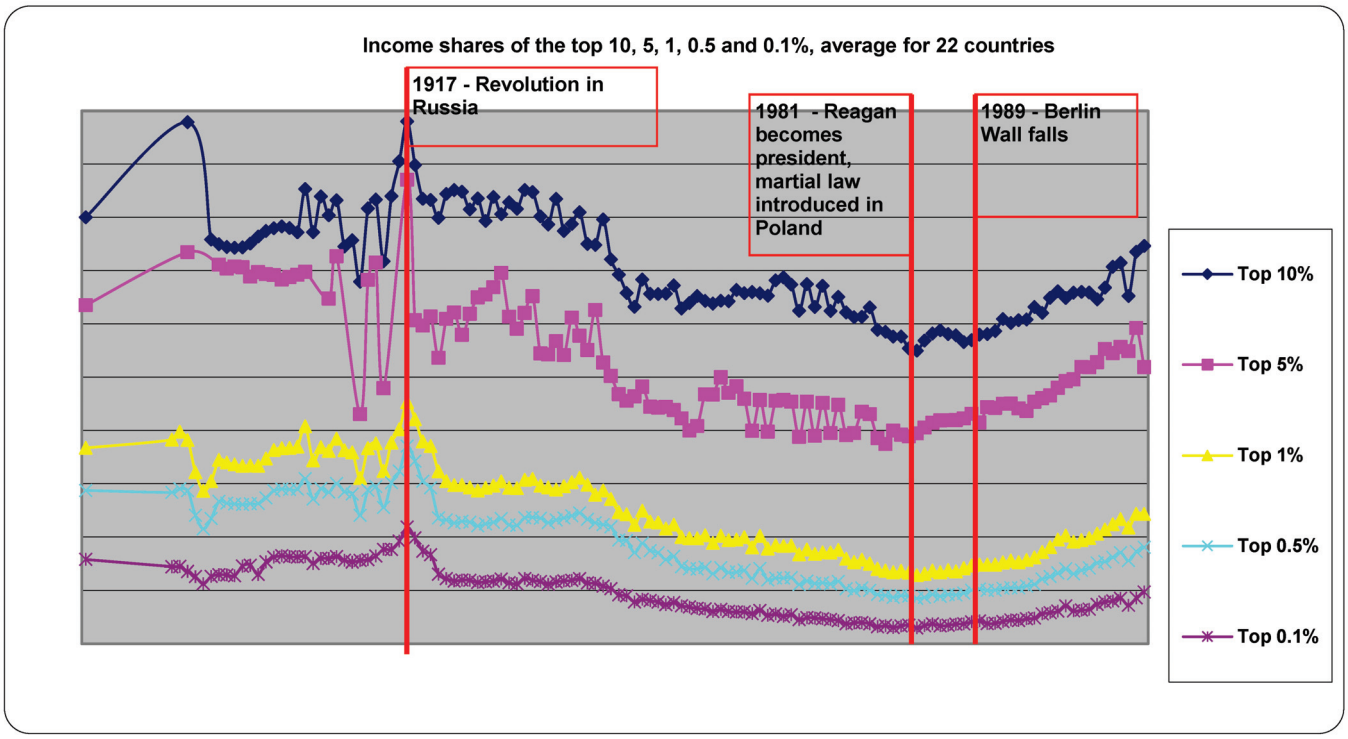


Figure 1. Income shares of the top 10, 5, 1, 0.5 and 0.1 percent, unweighted average for 22 countries. Source: The World Wealth and Incomes Database, http://www.wid.world/#Database; accessed on 25 February 2025. European countries: Denmark, France, Germany, Netherlands, Switzerland, the UK, Ireland, Norway, Sweden, Finland, Portugal, Spain, and Italy; North America: United States and Canada; Australia and New Zealand; Latin American country—Argentina; Asian countries—Japan, India, China, Singapore, and Indonesia; Sub-Saharan Africa—South Africa, Mauritius, and Tanzania. Overall—approximately ½ of the population of the world.

Only during Hobsbaum's 'short 20th century' was the trend towards increased income and wealth inequality temporarily interrupted, probably because of the greater egalitarianism of socialist countries with lower levels of inequality (with Ginis between 25 percent and 30 percent on average) and the checks in the rising inequality with the growth of socialist and other egalitarian movements (Figures 1 and 2).

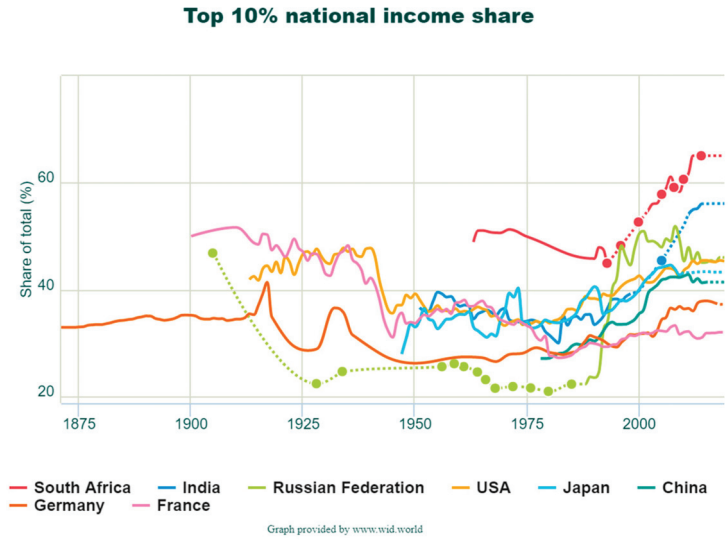


Figure 2. Share of the top income group in total income in selected countries, %. Source: World Inequality Database; (Alvaredo et al., 2016).

Inequality in wealth distribution has followed a similar pattern (Figures 3 and 4): inequality grew before the First World War, declined in the 1920s–1970s and started to increase again afterwards. Comparison of the wealth of the richest tycoons in different countries in different epochs (Figure 5) points to a similar conclusion—compared to the average income in the US, Bill Gates was relatively richer than Carnegie and Crassus (though not richer than Rockefeller), whereas Russian tycoon Mikhail Khodorkovsky in 2003 was even richer (compared to the average income in Russia) and Carlos Slim was relatively richer than all of them. The world may not have reached the highest level of inequality yet, but may still be moving to the greatest inequality ever observed in human history.

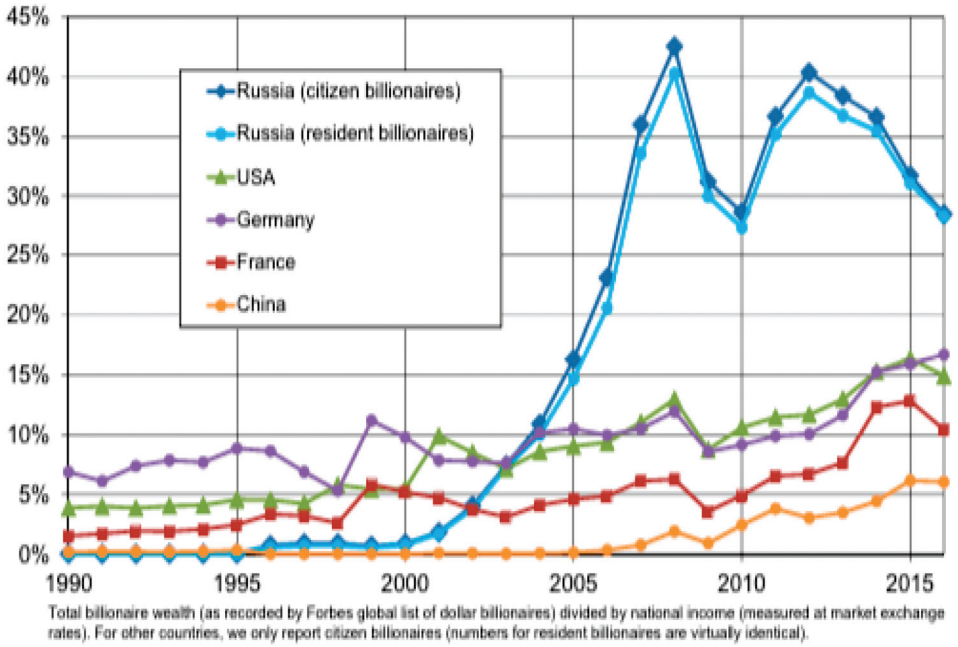


Figure 3. Billionaires' wealth from Forbes' list as a % of national income in 1990–2016 in major countries. Source: Novokmet et al. (2018).

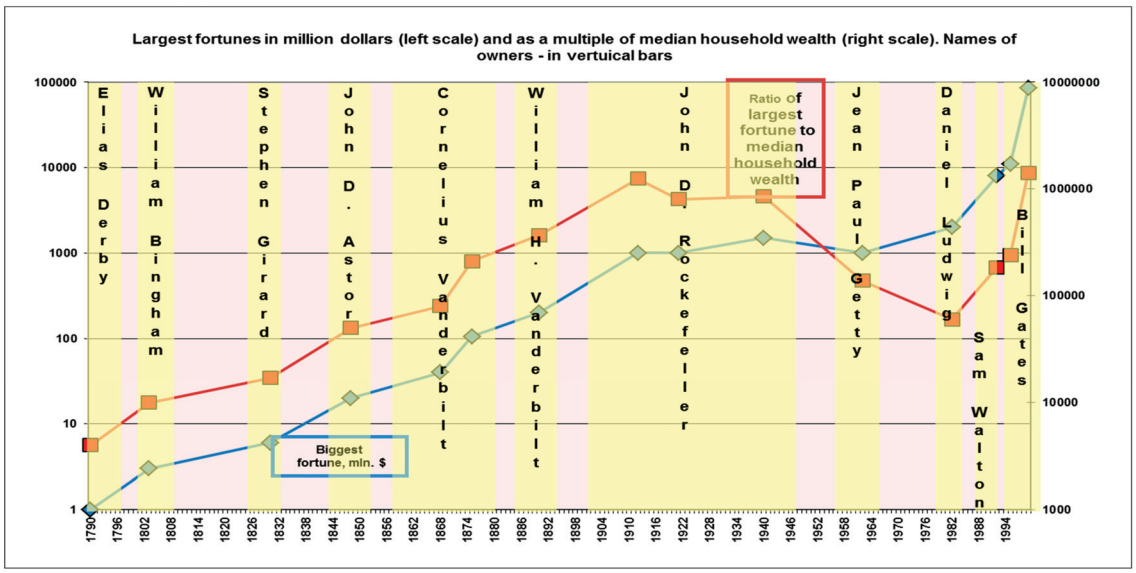


Figure 4. Largest fortunes in the US in USD millions and as a multiple of the median wealth of households, on the log scale. Source: Phillips (2002).

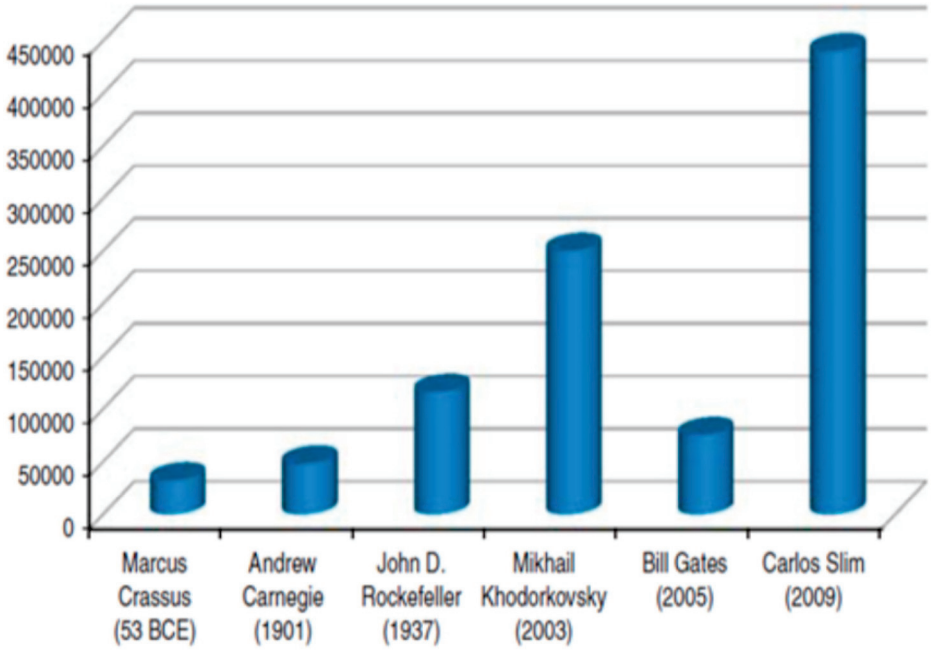


Figure 5. Incomes of the richest as a multiple of the average national income. Source: Milanovic (2011).

One explanation is that the reversal of the trend towards growing inequality followed the 1917 Bolshevik revolution in Russia, the emergence of the USSR and other socialist countries, the strengthening of socialist and populist movements, the growth of the welfare state and other changes associated with Karl Polanyi's *Great Transformation* (Jomo & Popov, 2016). The strength of robust and egalitarian alternatives has constrained and checked economic inequality, especially as long as socialism was relatively dynamic and seemed to be catching up with the West (Popov, 2014a, Chapter 3; Popov, 2014b).

When socialism lost its dynamism from the 1970s and posed less of a threat, the conservative reaction in the Anglophone West followed, led by Thatcher and Reagan in the 1980s, weakening workers' movements. Government spending, including social spending, stopped growing, many social security programs were curtailed, and unemployment rose to highs not seen since the 1930s, as trade unions were defeated in their industrial actions (coal miners in the UK, air traffic controllers in the US), causing union membership to decline. The top income tax rates, higher than 50 percent in the United States, United Kingdom, Germany and France during 1940–1980, dropped to below 50 percent by 2010 (Piketty, 2014). The collapse of the Berlin Wall (1989) and the USSR (1991) was among the high points of this resurgence, reflected in the counter-revolution against the welfare state, as well as Keynesian and development economics.

Not surprisingly, income and wealth inequality has risen in most countries since (Figures 1–5) and this facilitated, if not caused directly, the rise of nationalist forces and politicians in many countries—from Boris Johnson in Britain, to father and daughter Le Pen in France, the "Alternative" movement in Germany, Donald Trump in the US, and Victor Orban in Eastern Europe. As statistical analysis of voting patterns showed, not so much race or gender issues, but rather economic-based appeals were central to the success of Donald Trump in 2016 (Ferguson et al., 2018).

World inequality—considering the whole globe as a territory with no country boundaries—declined in recent decades, as depicted by the famous "elephant curve", showing that the world's super rich (top 1% and 5%) experienced a smaller increase in income than the Global middle class (Lakner & Milanovic, 2013). This happened due to the rapid growth of China and other developing countries—*between-country inequality*

fell (Popov & Jomo, 2018). But *inequality within countries* in most instances increased and became the driving force of the rise of nationalism.

In some countries of the Global South (Latin American countries and East Asian countries), the postwar trend towards the increase in inequality was interrupted after the 2008–2009 Great Recession, so that Gini coefficients and the share of 1% and 10% of the top income groups in total income somewhat declined in the 2010s, but in the US, many European countries and India, the increase in inequality continued well into the 2020s (WID).

The major alternative explanation of the rise of nationalism in Western countries is the increase in migration from countries of the Global South (see for a discussion: Piketty & Sandel, 2025). However, successful countries, regions and communities—the rich, with fast-growth and even distribution of fruits of growth (inclusive development)—normally do not have problems with assimilation of large inflows of migrants. The US did not have problems with the migrants until recently, when it started to lose its competitiveness to China. In Germany, the strongest anti-migration sentiments are in Eastern *Lander*, even though the share of foreign-born residents is higher in Western *Lander*.

In the words of Thomas Pikketty, "in the counties where Trump has been receiving <this is a citation> the most votes, the big predictor is the destruction of manufacturing jobs. It is not the inflow of migrants from Muslim countries or wherever. . . .We see the same in France. There were, historically, among Jean-Marie Le Pen voters, people who were clearly angry at North African migrants. But today, the party of his daughter Marine le Pen, the National Rally, draws its voters mainly from small cities with no migrant population, where the real issue is opposition to European trade policy and the offshoring of jobs. These voters are saying "Our main problem is trade competition. Whether it's from Turkey, from China, from Algeria, from Mexico is not the issue. The issue is that we are losing jobs"" (Piketty & Sandel, 2025).

3. Empirical Evidence

There are different measures of nationalism (public opinion polls, asking questions like "Do you think your country is/should be number 1?" and "Do you consider yourself as a world citizen/ citizen of the country?"). The World Value Survey (WVS) has a question (number 254 in the last round) "How proud are you of your nationality" (possible answers: very proud, quite proud, not very proud, not at all proud, do not know). The pride index used below is equal to the number of answers of "very proud" and "quite proud" divided by the number of answers of "not very proud" and "not proud at all". The decline in the pride index is taken as a proxy for the nationalism variable: if less and less people are proud of their country, they are likely to support nationalist leaders promising "to make the country great again". The rise in the index is a symptom of healthy development—the country is on the right track, globalization is perceived to be good and fair by more and more people. The decline in the index implies that people are disappointed in the performance of their country and want to "make it great again".

The WVS, however, provides comparable information for only approximately 30 countries for the period of 1989–2022 (first to seventh rounds of the WVS), but the list of countries changes from one round to another (Table 2). There are data on 12 countries for the first wave of the survey (1981–1984) and for over 100 countries for the sixth and seventh rounds (2010–2014 and 2017–2022), but I have chosen a period of 1989–2020 as a compromise between the need for a reasonable number of points and the length of the period in question. Further, later the force majeure events, like the pandemic (2020–2022) and the Russian–Ukrainian war and associated sanctions (2022–2025), could have changed the previous trends and deserve a special analysis.

Table 2. The pride index in selected countries in 1980–2022 (ratio of the number of answers of "very proud" and "quite proud" to the number of answers of "not very proud" and "not proud at all").

COUNTRY/PERIOD	Pride Index in Periods of 7 Rounds of World Value Survey							Pride Index in 2020 as a Fraction of 1990
	1981–1984	1989–1993	1994–1998	1999–2004	2005–2009	2010–2014	2017–2022	
Argentina	4.9	5.9	7.5	12.7	18.4	11.3	8.9	1.5
Brazil		6.1	5.2		5.2	3.5	1.6	0.3
Belarus		4.6	3.7			4.5	9.2	2.0
Chile		6.1	6.7	13.3	15.5	15.5	3.6	0.6
China		4.4	7.8	4.6	3.7	8.7	11.4	2.6
Czechia		2.0	5.9				4.4	2.2
India		15.5	11.0	14.7	22.5	31.7	18.6	1.2
Japan	1.8	1.9	1.6	1.4	1.5	2.5	4.6	2.4
South Korea	4.0	4.2		3.5	8.1	9.9	4.3	1.0
Mexico	7.9	7.8	15.0	18.8	19.0	19.0	10.1	1.3
Nigeria		6.6	5.7	9.1		13.3	8.9	1.3
Poland		47.5	32.0	24.0		23.8	47.5	1.0
Russia		1.9	2.4		5.4	4.1	11.0	5.9
Slovakia		3.0	8.4				6.5	2.2
South Africa	3.1	9.9	32.0	19.0	32.0	9.9		
Sweden	2.7	5.2	8.5	6.8	7.5	7.5	12.6	2.4
Switzerland		4.3	3.0		5.8		8.1	1.9
Turkey		11.3	23.5	8.6	22.5	30.3	12.6	1.1
United States	31.7	47.5	48.5	23.5	10.9	10.9	4.1	0.1

Source: WVS.

Developing countries generally have a higher pride index—probably because these are more traditional and less globalized societies. But it is the dynamics of the pride index that could be used as an indicator of nationalism—when pride in one's own country declines, it is easier to mobilize support for nationalistic measures.

The dynamics of this index for all countries on which data are available is shown in Table 2 and Figure 6. A total of 10 countries (Russia, China, Czechia, Slovakia, Sweden, Japan, and South Africa) experienced an increase in the index of 2 or more fold in 1990–2020, whereas in 7 countries (Argentina, India, South Korea, Mexico, Nigeria, Poland and Turkey), the increase was moderate (less than 2 fold), and in Brazil, Chile and the United States, the index declined.

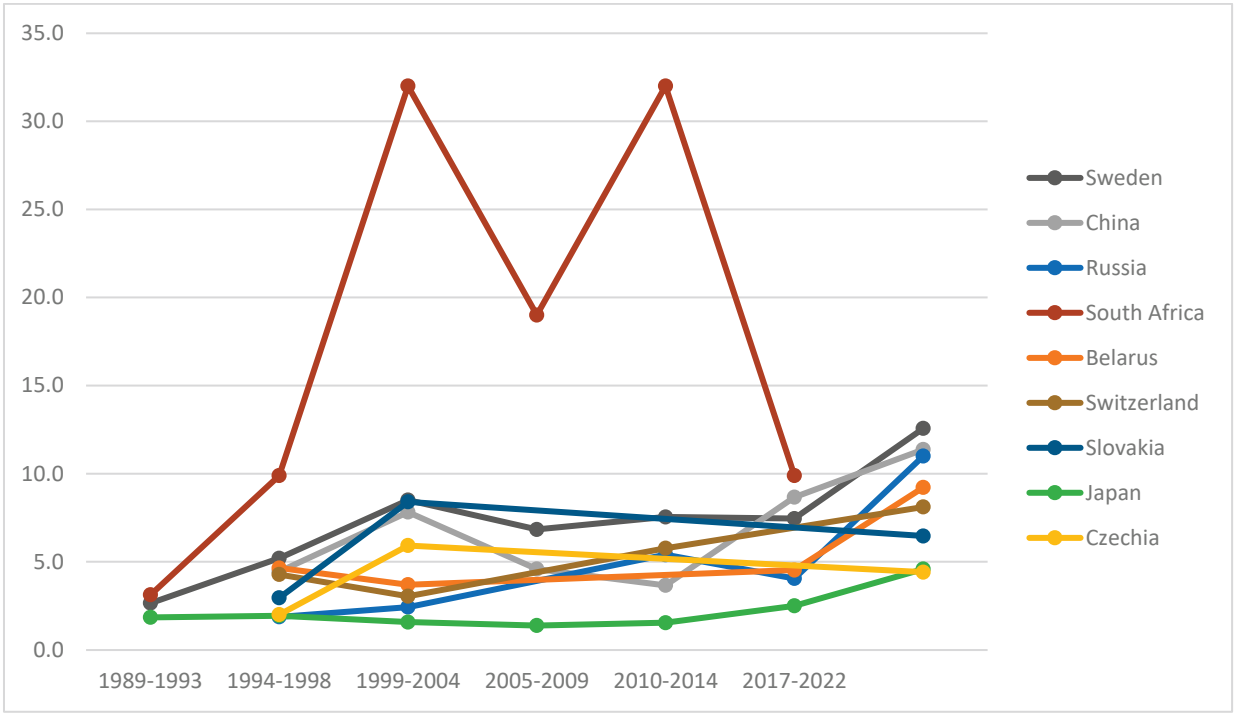
The increase in the pride index appears to be associated not only with the economic/social/military success of the country, but with how evenly (fairly) this success was distributed—high income inequality had a negative impact on the increase in the pride index (Figure 7). The only outlier in Figure 7 is Russia, where the increase in the pride index was obviously associated with the reunification with Crimea and Novorossiya and the Russian–Ukrainian war.

It is noteworthy that from 1981–1984 to 2017–2022, the pride index declined in the US and in all the Latin American countries (Argentina, Brazil, and Chile) that were included in the sample except for Mexico.

The regression equations linking the increase in the pride index with the level of the index in 1990 (***Pride1990***), GDP per capita in constant 2015 USD in 1990 (***GDPcap1990***), the increase in this per capita GDP in 1990–2020 (***GDPcapINCR***), inequality in 2020 (***GINI2000***), and the Russia dummy variable (***Russia***) are reported in Table 3.

The controls for the initial level of GDP per capita (**GDPcap1990**) and for the initial level of the pride index (***Pride1990***) are necessary because the level of the pride index is very different in different countries and is determined by a number of factors. One obvious factor is the level of economic development (per-capita income)—more developed countries usually have higher pride indices. But there are more specific factors as well—US nationalism, as argued by Anatol Lieven, is fueled by the traditional messianic vision of the nation's role in the world, and a recent feeling of defeat. To find a similar level of nationalism in Europe, one has to go to the period before the Second World War or even before the First World War (Lieven, 2012).

Countries where the pride index more than doubled in 1990–2020



Countries, where the pride index increased by less than two fold or declined in 1990–2020

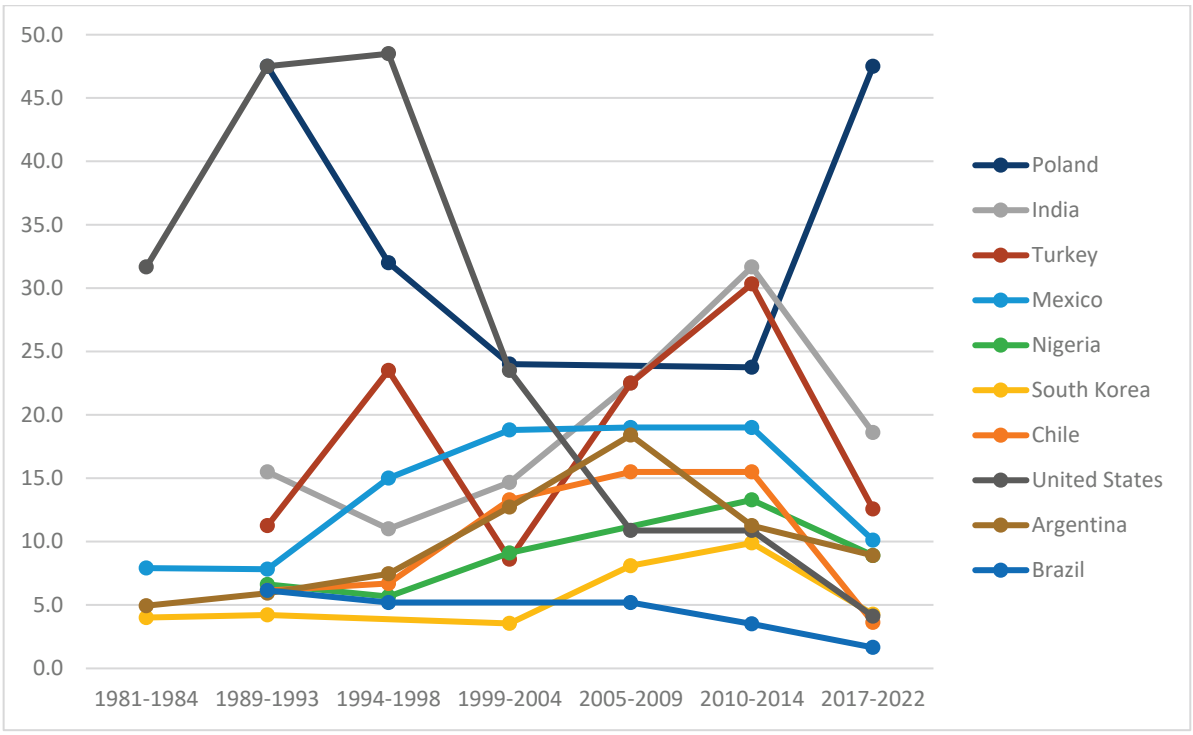


Figure 6. The pride index in major countries in 1980–2022 (ratio of the number of answers of "very proud" and "quite proud" to the number of answers of "not very proud" and "not proud at all"). Source: (World Values Survey, 2025), http://www.worldvaluessurvey.org/wvs.jsp; accessed on 25 February 2025.

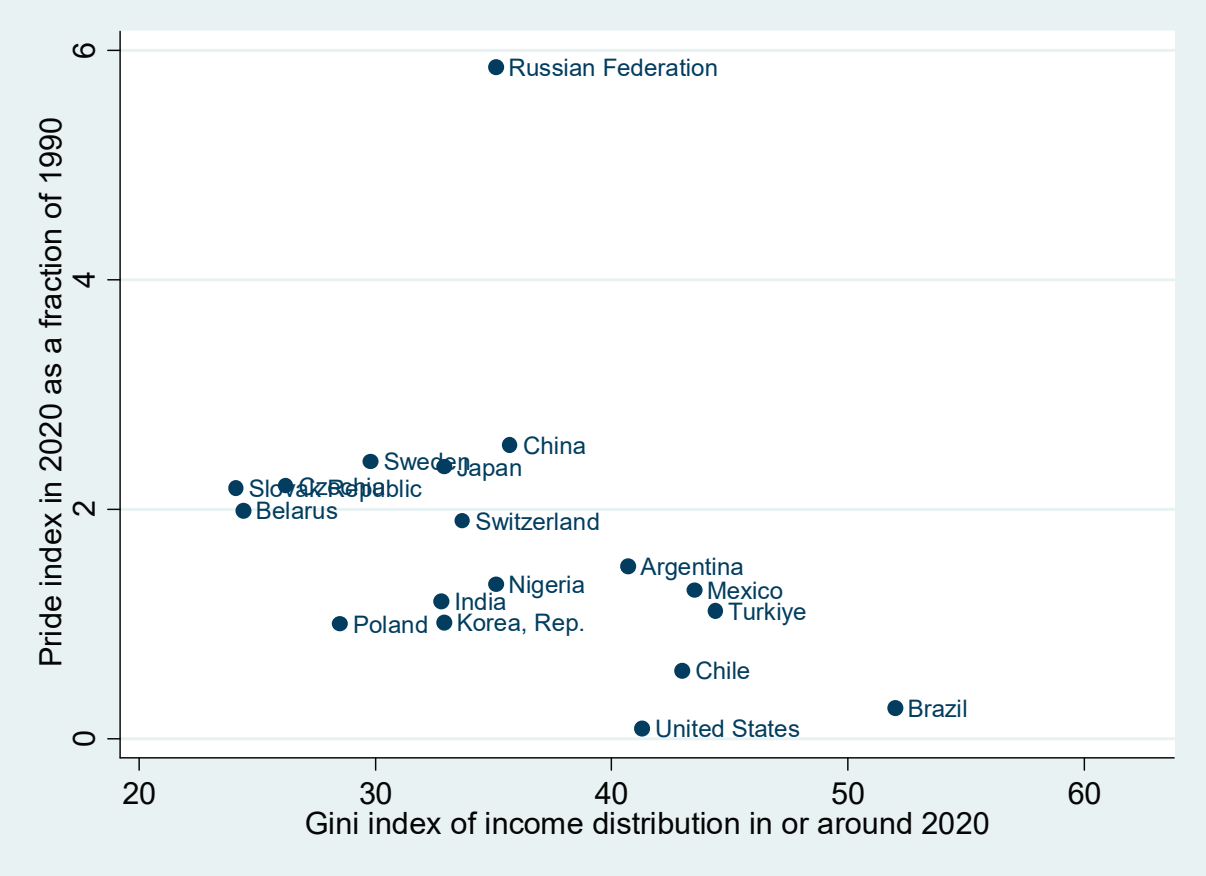


Figure 7. The increase in the pride index in 1990–2020 (times) and the Gini coefficient of income distribution in or around 2020, %. Source: World Values Survey; World Development Indicators Database.

Table 3. Determinants of the increase in the pride index—regression results, robust estimates. **Dependent variable—the** increase in the pride index in 1990–2020.

Equations/Variables	1, N = 18	2, N = 18	3, N = 18	4, N = 18	5, N = 18	6, N = 18	7, N = 18	8, N = 18
Pride1990—level of pride index in 1990		−0.04 ***			−0.03 ***	−0.03 ***	−0.03 ***	−0.03 ***
GDPcap1990—GDP per capita in constant 2015 USDs in 1990				8.0×10^{-6}		6.0×10^{-6}		9.9×10^{-6} *
GDPcapINCR—increase in per capita GDP in 1990–2020, times				0.04 **			0.06 *	0.08 ***
GINI2000—Gini coefficient in 2000 or nearest year, %	−0.07 ***	−0.06 ***	−0.06 ***	−0.06 **	−0.06 ***	−0.06 ***	−0.06 ***	−0.06 ***
Russia—Russia dummy variable			4.4 ***	4.5 ***	4.1 ***	4.2 ***	4.2 ***	4.3 ***
Constant	4.0 ***	4.3 ***	3.7 ***	3.3 ***	3.9 ***	3.8 ***	3.7 ***	3.4 ***
R^2	15	32	59	84	90	90	91	93

***, **, and *—significant at 1%, 5%, and 10% level, respectively.

After the control for these variables, as well as Russia's dummy variable discussed above, an increase in the pride index appears to be associated with the economic success of the country—the greater the increase in per-capita income in the period in question (1990–2020), the larger the increase in the pride index; and with how evenly (fairly) the economic success of a country was distributed, income inequality had a negative impact on the increase in pride (Table 3).

Even though there are only 18 observations, the regression results are very robust to the inclusion/exclusion of variables—all variables are significant, except for two cases

(per capita 1990 GDP in equations 4 and 6). This variable, however, becomes significant in other specifications that yield higher R^2. F-statistics is good in the first and second equations (Prob > F = 0.001), but it cannot be computed in other equations—those with too few observations and with too many variables.

4. Case Studies—The US, the EU, and Russia

4.1. The US

In the United States in the late 18th century, income and wealth inequality were initially probably lower than in Europe due to the absence of large accumulated fortunes in the New World and the availability of abundant 'free land'. In the late 18th century, the top 10 percent of wealth holders accounted for only 45 percent of total wealth in the US, compared to 64 percent in Scotland and 46–80 percent in Finland, Norway, Sweden and Denmark (Soltow, 1989). But it appears that inequality increased greatly in the 19th century and in the 20th twentieth century, reaching a peak between the two world wars. Soltow (1989) finds a decrease in income inequality in the 1798–1850/1860 period in the US, and little or no increase in wealth inequality over the same period. However, the ratio of the largest fortunes to the median wealth of households (Figure 4) (Phillips, 2002) suggests a different story. This ratio increased from 1000 in 1790 (Elias Derby's wealth was estimated to be worth USD 1 million) to 1,250,000 in 1912 (John D. Rockefeller's fortune of USD 1 billion), falling to 60,000 in 1982 (Daniel Ludwig's fortune of 'only' USD 2 billion), before increasing again to 1,416,000 in 1999 (Bill Gates' USD 85 billion fortune). In 2025, the fortune of Elon Mask was approaching USD 1 trillion, approximately 5,000,000-fold larger than the median net wealth of households (USD 192,000 in 2022—https://www.investopedia.com/average-americans-net-worth-8713595; accessed on 25 February 2025).

It may well be, however, that in the long run, the recent rise in inequality in the US (and the UK) has not yet brought the Gini coefficients to the level in the mid-late 19th century, but the speed of the increase in inequality seems to be unprecedented (Figure 8).

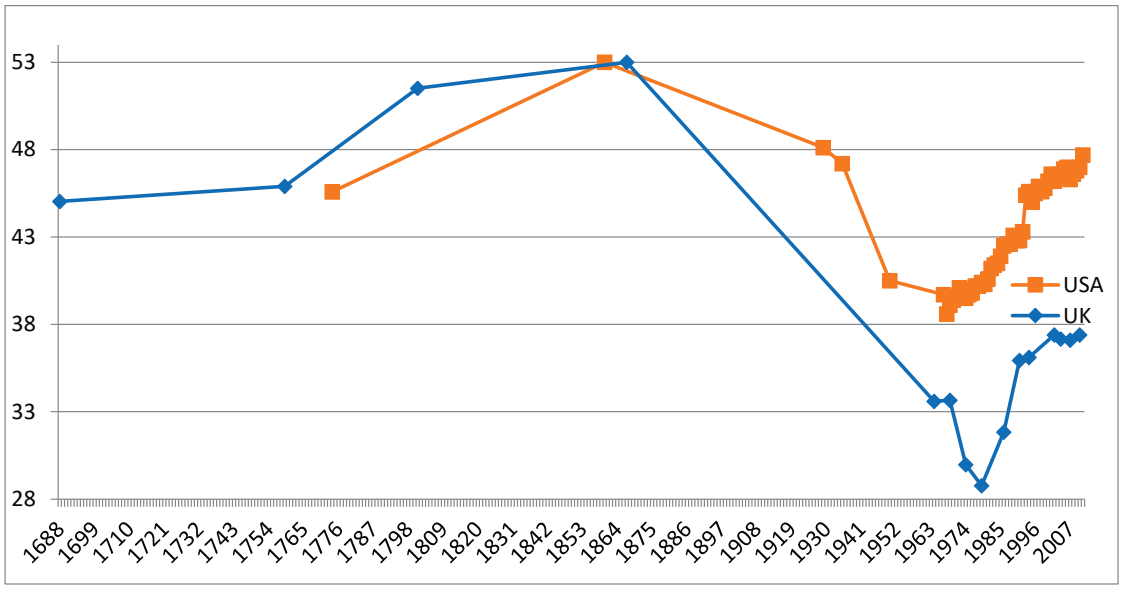


Figure 8. Inequality in the US and the UK over the long run, Gini coefficients (%). Sources: The Gini coefficients were computed by Milanovic from social tables before the 20th century and from household survey and tax returns afterwards (Milanovic, 2011; Milanovic et al., 2007, 2011), and personal correspondence with Milanovic. N.B. Comparable data for the 1867–1929 period are not available (Alvaredo et al., 2012).

Economic misfortunes contributed to the increased mortality and morbidity, especially for the poor non-Hispanic white population, whose relative position and status declined the most. Case and Deaton (2015) document a marked increase in the mortality of the middle-aged white non-Hispanic population in the US after 1998 in all 5-year age groups from 30 to 55. The leading causes for the increased mortality were poisoning, suicide, chronic liver disease, and cirrhosis. Increasing mortality in the middle-aged white population was matched by increasing morbidity. When compared side by side with the mortality increase, declines in self-reported health and mental health, increased reports of pain and greater difficulties with daily life show increasing distress among the white population in midlife after the late 1990s.

They see some economic reasons for such a mortality rise: "Although the epidemic of pain, suicide, and drug overdoses preceded the financial crisis, ties to economic insecurity are possible. After the productivity slow down in the early 1970s, and with widening income inequality, many of the baby-boom generation are the first to find, in midlife, that they will not be better off than were their parents. Growth in real median earnings has been slow for this group, especially those with only a high school education. However, the productivity slow down is common to many rich countries, some of which have seen even slower growth in median earnings than the United States, yet none have had the same mortality experience. ... The United States has moved primarily to defined-contribution pension plans with associated stock market risk, whereas, in Europe, defined-benefit pensions are still the norm. Future financial insecurity may weigh more heavily on US workers, if they perceive stock market risk harder to manage than earnings risk, or if they have contributed inadequately to defined-contribution plans" (Case & Deaton, 2015).

This dominant ethnic group of the non-Hispanic white population (approximately 200 million people out of over 300 million), especially men, is exactly the group that gave rise to nationalism in the US. As public opinion polls show, the greatest support for Trump in the US comes from white middle-aged men without a college degree who are relatively poor (http://politicsthatwork.com/blog/trump-supporters.php; accessed on 25 February 2025).

The rise of nationalist sentiments and politics in the US is clearly observable inthe proliferation of the protectionist tendencies to fight the competition of Chinese goods. In May 2024, the Biden administration raised tariffs on many Chinese goods, including electric batteries, solar panels, computer chips, and electric vehicles (the latter by a whopping 4 fold, from 25% to 100%). The irony is not only that the United States, which traditionally defended free trade and demanded that other countries eliminate trade barriers, moved towards outright protectionism, but also that tariffs were imposed on precisely the equipment needed for the transition to a "green economy." China produced 80% of the world's photovoltaic modules, 60% of wind turbines, and 60% of electric vehicles and batteries; in 2023, the increase in its solar panel capacity alone was greater than the entire installed capacity in the United States. "The moral, environmental, and economic arguments all favor those who subsidize their green industries, not those who want to tax others' production" (Rodrik, 2024).

The second victory of Donald Trump in the 2024 presidential elections led to even more protectionist and anti-immigration measures, a decline in world trade, and de-globalization. Traditional roles have changed: today, China is for the elimination of tariffs because it is more competitive, like Britain after 1848 (with the repeal of the Corn Laws) and before the Second World War, and like the US since the Second World War and until recently. The postwar success and high competitiveness of the US prompted it to support openness and to welcome foreign competition—free trade, immigrations and globalization—for nearly half a century. But the loss of competitiveness (current account deficit since the 1970s)

and the growth of inequality since the 1980s led to the rise of nationalist sentiments and politicians.

4.2. The EU

In most European countries, income inequality increased since the beginning of the 1980s—the reversal of the trend that predominated since the early 20th century (Figure 9). This increase in inequality may be the single-most important reason for the rise of nationalism. In Eastern Europe, there was a transformational recession in the 1990s associated with the transition to the market economy—output fell by 20–50% in the course of 2–5 years (Popov, 2000), which certainly contributed to the rise of nationalism. But in Western Europe, there was no major recession (except for Greece), economic growth was not very strong, but rather stable, the recessions of 1993 (per capita GDP fell by 0.4%), 2009 (−4.7%) and 2012–2013 (−0.4%) were overcome, and average incomeswere way higher in 2020 than in the 1980s. However, the progressing unevenness in income distribution undermined the real incomes and social status of large groups of the European population, making them easy targets for nationalist politicians.

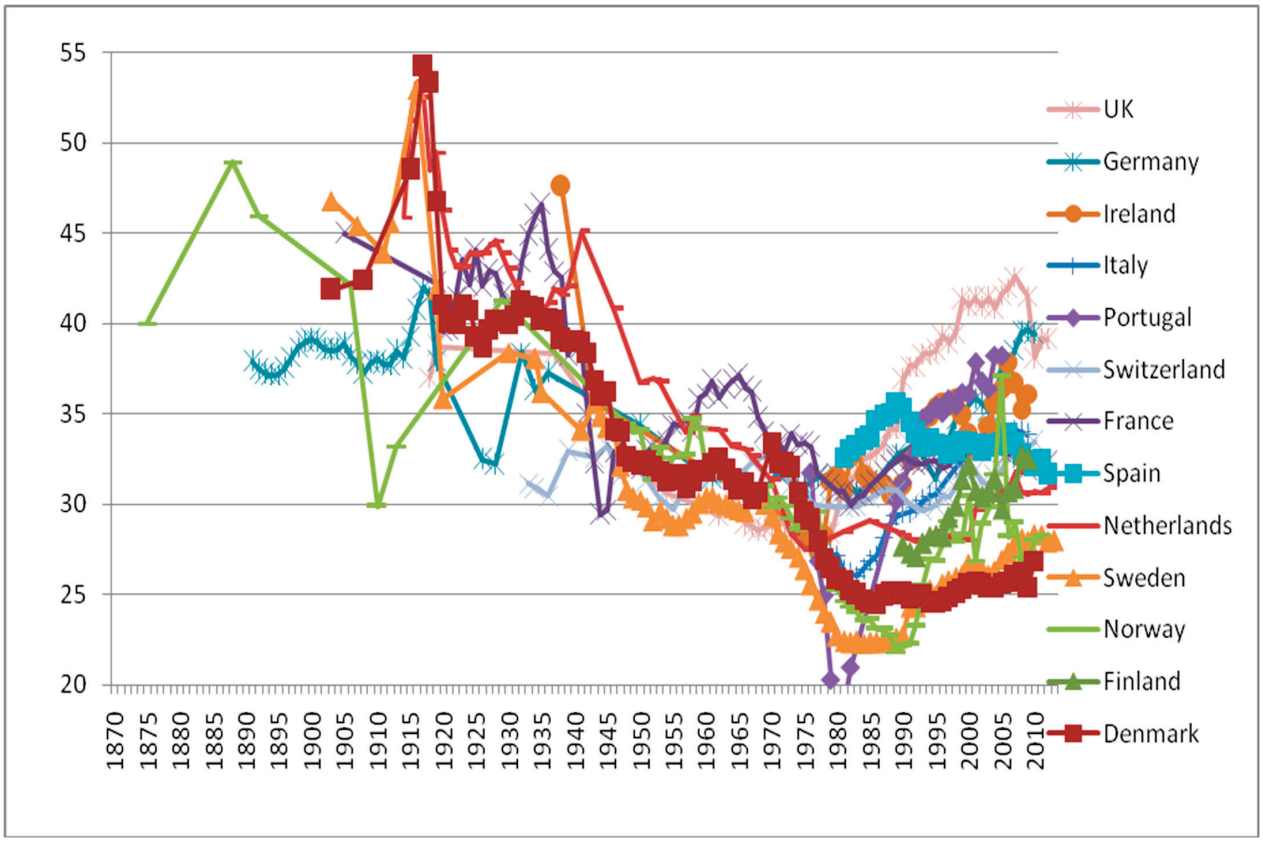


Figure 9. The share of the 10% richest households in total personal income in European countries since 1875, %. Source: (World Wealth and Income Database, 2025; Alvaredo et al., 2016).

Britain may be the case in point (Popov, 2023). The rise of nationalism is often explained by unfairness and humiliation experienced by the whole nation (for instance, Germany after the First World War or developing countries where costs of globalization are often higher than benefits). In Britain, however, the recent rise of nationalism did coincide with relatively successful economic development and with the improvement of its economic positions versus major competitors. Britain was falling behind continental Western Europe in terms of its per-capita income and this trend was reversed only after Britain entered the EU (Figure 10).

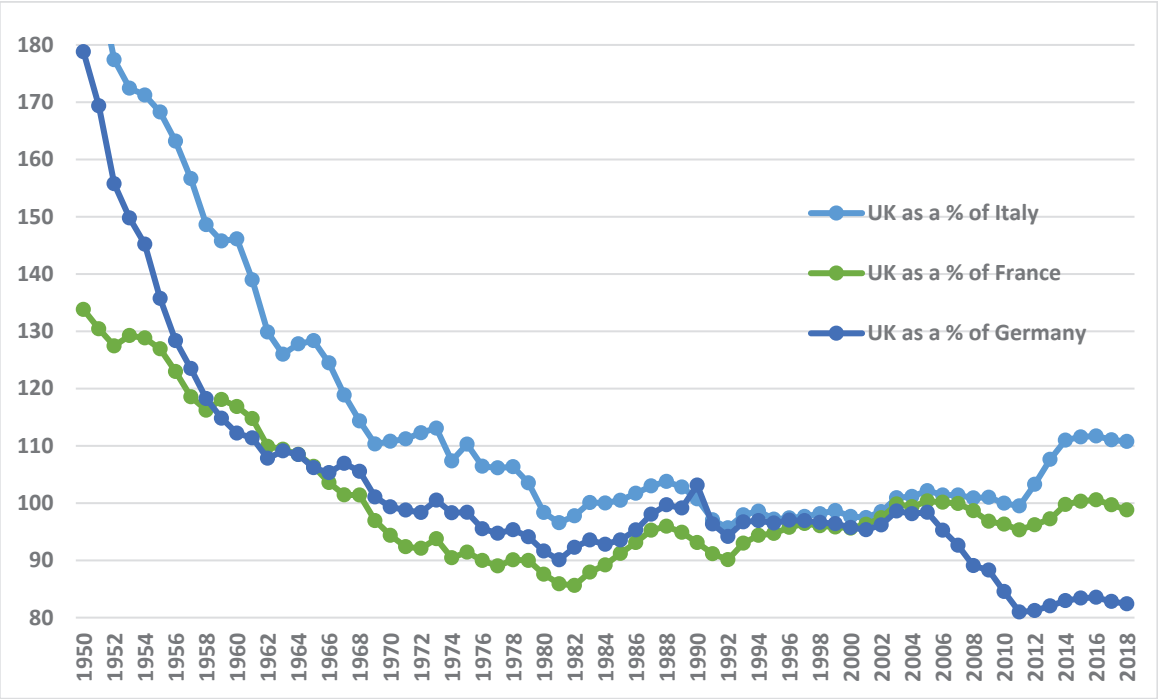


Figure 10. The UK PPP GDP per capita as a % of Germany, France and Italy. Source: (Maddison Project, 2020).

However, only a minority of the population benefited from the acceleration of economic growth since the early 1980s—income inequality increased (Figure 9) and so did wealth inequality (Figure 11).

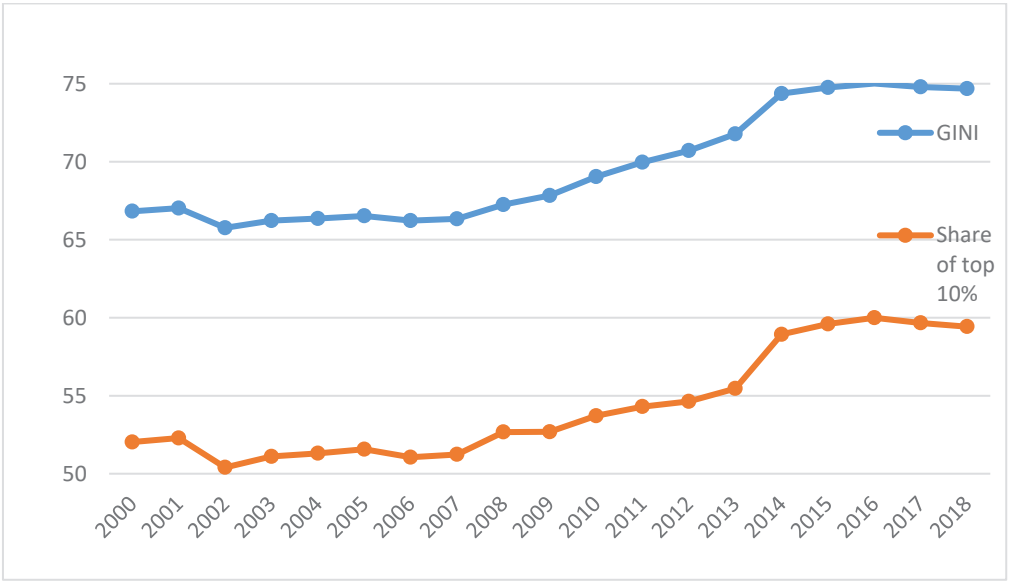


Figure 11. Share of the top 10% of population in total national wealth and the Gini coefficient of wealth distribution, %. Source: (Global Wealth Report, Credit Suisse, 2025) (https://www.credit-suisse.com/corporate/en/research/research-institute/global-wealth-report.html; accessed 25 February 2025).

From the point of view of economic efficiency and future growth, Brexit seems to be bad for the EU and especially bad for Britain. A total of 70% of Dahrendorf working group members and experts believed that Brexit will weaken the UK, but the EU will muddle through (Oliver, 2016). But the majority of British voters, albeit for a short time,

apparently blamed economic difficulties not on policies that allowed inequality to increase, but on European integration and globalization (Figure 12) (Popov, 2022). After the 2016 referendum, the percentage of Brits considering Brexit the wrong decision surpassed the share of those who regarded it as the right move and stayed at this level almost permanently; in 2024 it exceeded 60% (Economist, 25 January 2025).

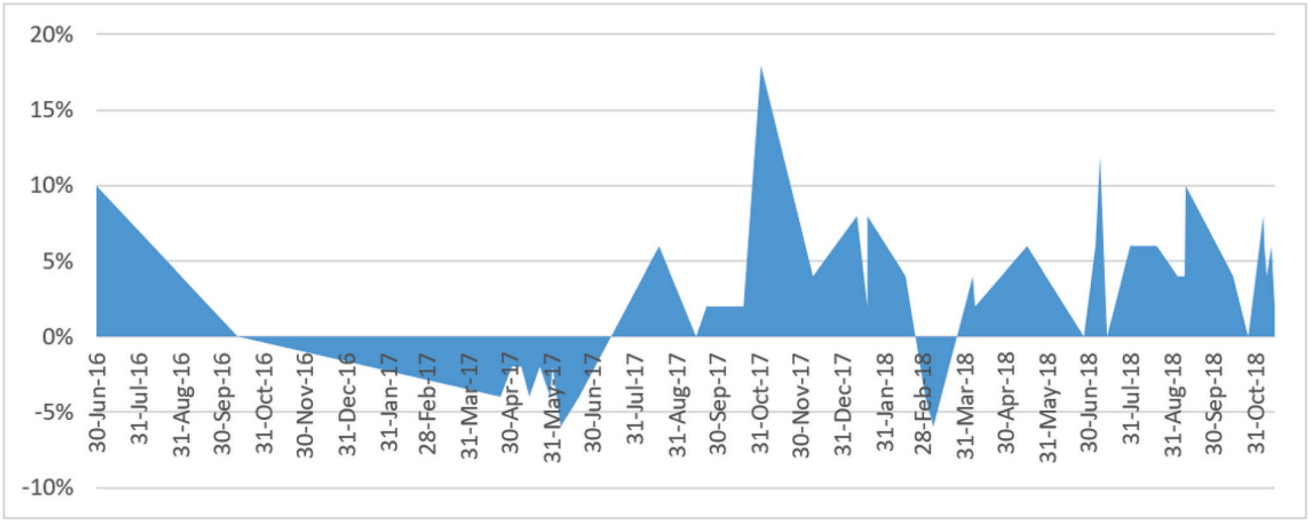


Figure 12. Opinion poll results on BREXIT—the percentage of "remain" votes minus the percentage of "leave" votes", p.p. Note: Answers to the question "If there was another referendum on Britain's membership of the EU, how would you vote?" Source: What UK thinks (https://whatukthinks.org/eu/questions/if-there-was-a-referendum-on-britains-membership-of-the-eu-how-would-you-vote-2/; accessed 25 February 2025).

4.3. Russia

Russia experienced a prolonged and deep transformational recession—output fell by 45% in 1989–1998. Output then nearly recovered to the pre-recession Soviet levels of 1989 by 2008, but fell again by a good 8% in 2009. In 2010–2013, GDP increased by 5%, but fell again by nearly the same amount in 2014–2016. The dynamics of real incomes was similar—they surpassed the 1990 level only after the 2008–2009 recession.

The Russian population, like any other, wants better living standards and a better social climate. Growing incomes, longer life expectancies, lower unemployment and crime rates in Russia, like in other countries, all other things being equal, lead to greater satisfaction with life, higher evaluation of one's prosperity/happiness and a greater feeling of pride in one's own country (Table 2 and Figure 13). The sharp decline in living standards in the 1990s and the steep increase in income inequality (Figure 14) led to the rise of nationalism as measured by the decline in the pride index and the decline in the happiness index (Figure 13).

There were two outbursts of nationalism—in the early 1990s (this wave gradually subsided during the macroeconomic stabilization period of 1995–1998) and right after the currency crisis of August 1998 that led to the new drop in real incomes, the rise in crime, mortality and inequality. The turning points in the happiness index and the pride index shown in the charts do not always tell the full story because for some periods, data are lacking. But the correlation of these indicators with GDP growth rates is quite obvious—the reduction in incomes and the pride and happiness indices in the 1990s, the increase in the 2000s when oil prices were growing, and stabilization and some decline during and after the recessions of 2008–2009 and 2014–2016. The percentage of votes casted for the nationalist Liberal Democratic Party and their leader Zhirinovsky was generally high when

the happiness index was low (Figure 13)—additional evidence that nationalism thrives on economic turmoil and a rise in social inequality.

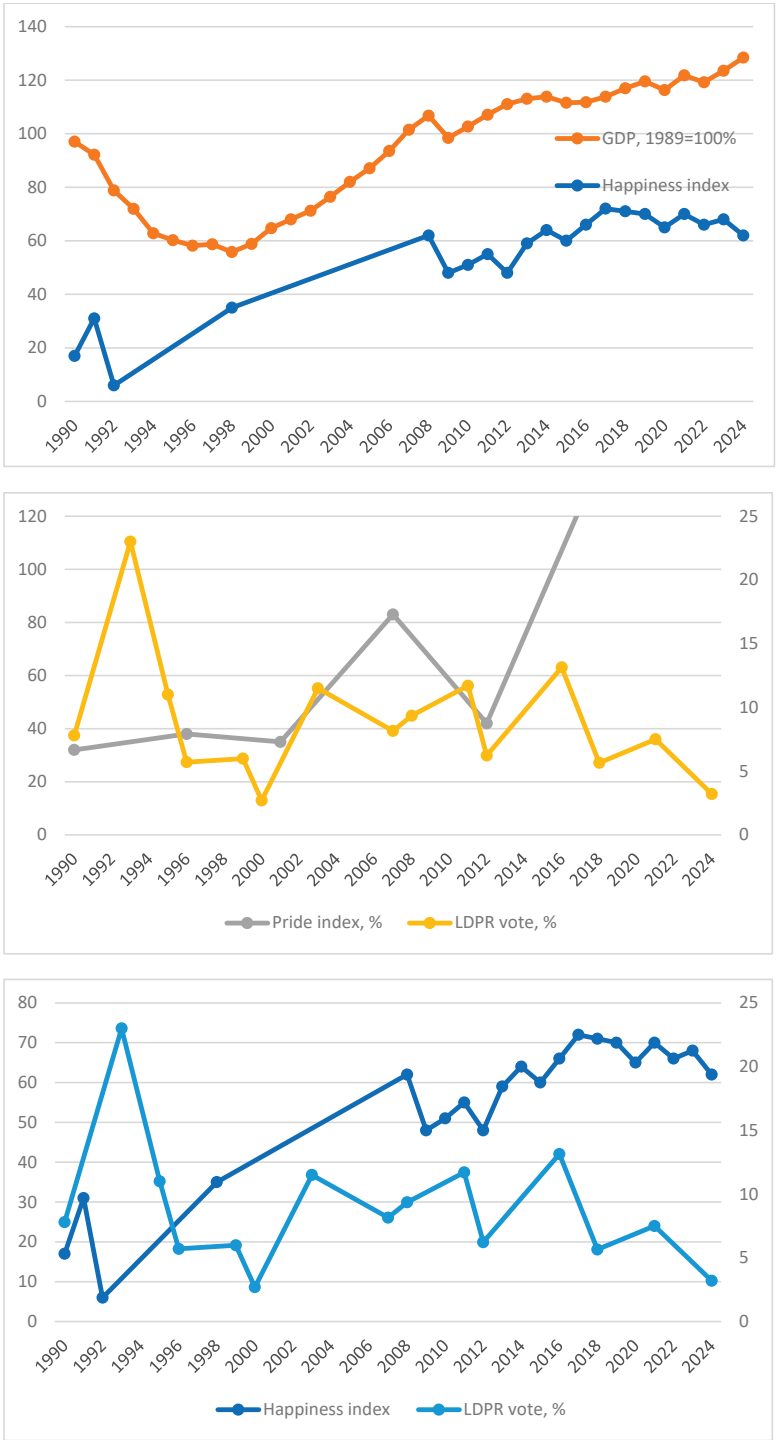


Figure 13. The GDP index (189 = 100%), the happiness index, the pride index and the percentage of votes for LDPR. Note: The happiness index is the difference between the percentage of respondents who said that they were happy and those who stated that they were unhappy. **Source:** (Russian Public Opinion Research Center (VTSIOM) (2025)) (http://wciom.ru/index.php?id=459&uid=114812 accessed on 25 February 2025); (WDI (World Inequality Database), n.d.); (Central Election Commission of the Russian Federation, 2025) (http://cikrf.ru/eng/).

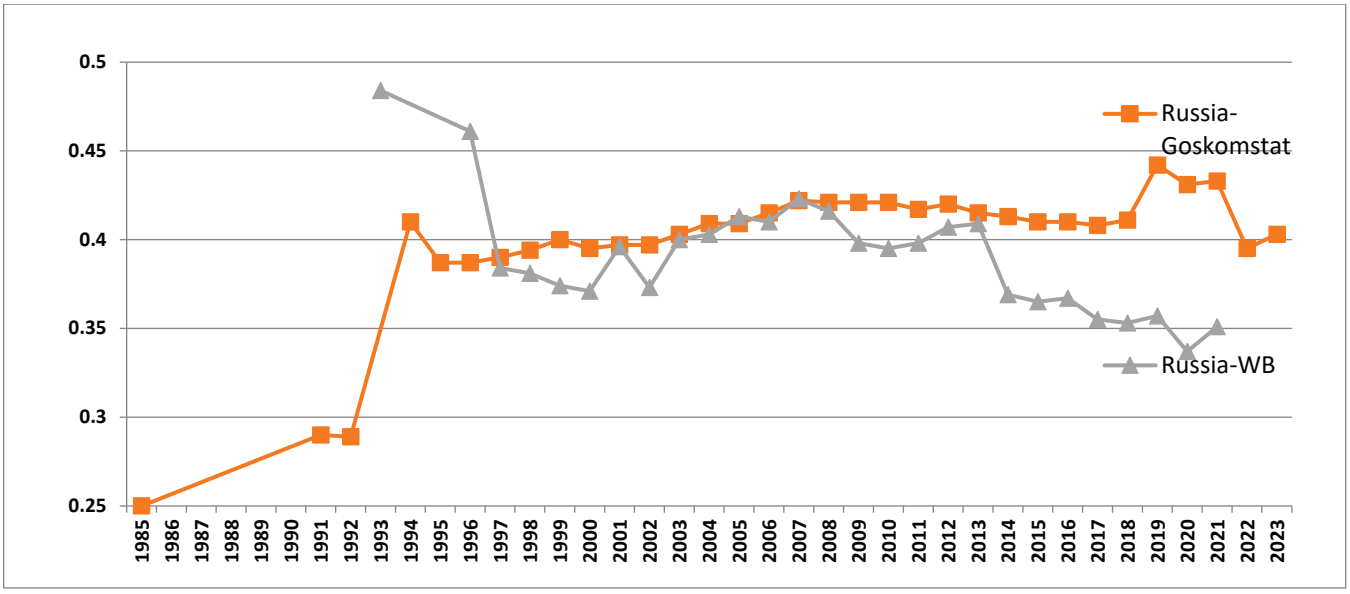


Figure 14. Income inequality in Russia, the Gini coefficient according to the World Bank and Russian national statistics. Source: (Goskomstat, n.d.) (www.gks.ru); WDI.

It is also noteworthy that there was no major surge in nationalist sentiments in Russia during and after the 2008–2009 recession, when the economy was barely growing or not growing at all. The explanation is probably associated with some stabilization of the social sphere—income inequality stopped growing and even declined somewhat (Figure 14), and mortality rates, crime rates and murder rates declined markedly.

5. Conclusions

The rise of nationalism in recent decades seems to be associated with the increase in income inequality. In some countries, income inequality did not increase and nationalist and anti-globalist sentiments are more related to the slow down of growth and other reasons, but there was an increase in income and wealth inequality since the 1980s in most countries—a reversal of the previous trend of over 50 years that created a fertile ground for the rise of nationalism.

The fall of the Berlin Wall, the collapse of the USSR and the conversion of Eastern Europe and former Soviet republics to capitalism added additional push to the growing income inequality trend due to both the increase in inequality in Western countries caused by the disappearance of the "socialist counterbalance" to Western capitalism and the rise in inequality in the transition countries of Eastern Europe and the former Soviet Union.

In recent years, the growth of international trade slowed down and was not as fast as the growth of the economy in many countries, so the ratio of external trade to GDP declined (Federico & Junguito, 2018) (Figure 15), as well as the ratio of foreign direct investment inflows to GDP (Figure 16). The process started after the Great Recession of 2008–2009, well before the COVID-19 pandemic (2020–2022) and the outburst of sanction politics associated with the Russian–Ukrainian war (2022–2025).

It may be hypothesized that the continuation of these trends could result in two outcomes. First, there may be social upheavals in some countries, where social tensions due to growing inequality will become unbearable and produce social turmoil. And the rise of nationalism may lead to conflicts, if not wars, between countries, with the collapse of international trade and capital flows, like in the 1930s. In this case, the world may once again take the familiar 20th-century track: there may be a pause or even a reversal of globalization, like during the Great Depression, when the outburst of protectionism led

to the decline in international trade and capital movement. This is the worst scenario: the world degrading into social and national conflicts.

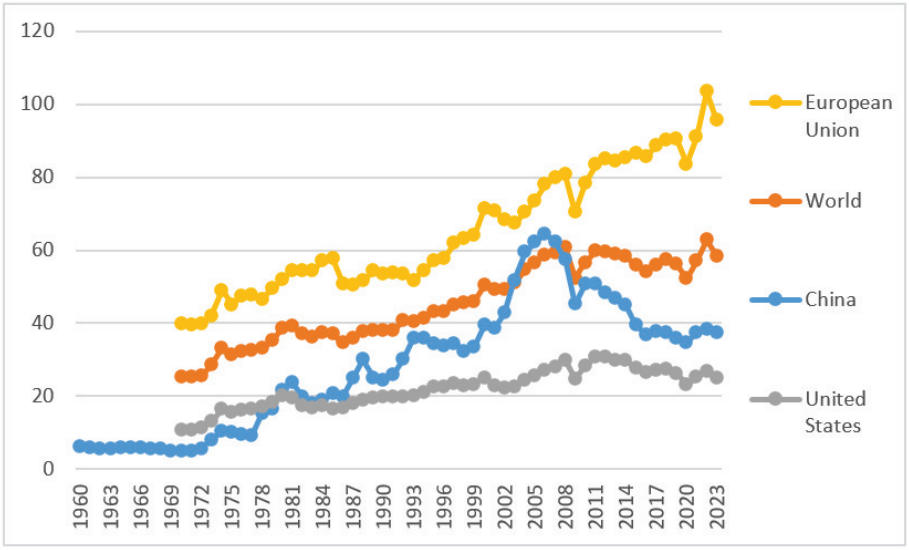


Figure 15. Foreign trade as a % of GDP. Source: WDI.

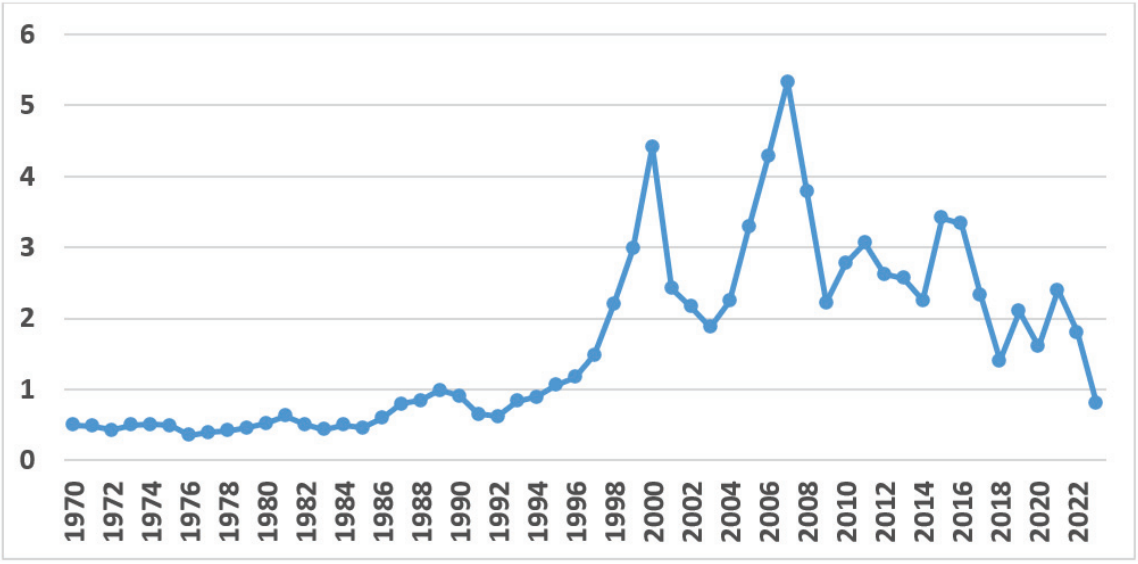


Figure 16. Foreign direct investment, net inflows, as a % of GDP. Source: WDI.

The second scenario implies that countries that carry out successful policies limiting inequality will become more competitive, driving other countries "out of business". Even small countries, if they are successful, may create a counterbalance through demonstrating a counter example of "unconstrained capitalism" to cut welfare programs and increase inequality. They may regulate the functioning of market mechanisms through direct interventions—the proliferation of free education and health care, as well as high progressive taxation to reduce bubbles and windfall profits. Further, a crucial way of lowering inequality is public and collective property, so it might be expected that state enterprises, non-profit institutions, labor-managed enterprises and co-ops, not-for-profit organizations, for public good become more common. There may be a rise of new grass-root socialism that becomes more competitive than capitalism (Popov, 2014b). Such an optimistic scenario implies that social upheaval within countries and conflicts between countries could be

largely avoided. These are of course only hypotheses based on the projection of current trends into the future.

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Notes

[1] Recent data from the representative nationwide household survey suggest that the Gini index in China may be even higher (47–49% in 2003–2012) than in a previous separate survey among rural and urban areas, but was not really growing in the last decade. It is important though to take into account the size of the country—in terms of both territory and population. Three Chinese provinces (Guangdong, Shandong, and Henan) have a population of over 95 million, another seven have over 50 million, i.e., bigger that most states, so China should be compared with multistate regions, like the European Union or ASEAN, rather than with particular states. In the EU 27, for instance, the coefficient of income inequality around 2005 was approximately 40% with 23 p.p. coming from between-country inequality. In China (29 provinces), the coefficient of income inequality was over 40% with 24 p.p. coming from between-province disparity. In the US, the inequality coefficient was similar (over 40%), but only 6 p.p. came from disparities in income between states (Milanovic, 2012). If China manages to reduce the income gap between its provinces (and the EU—between countries) to a level close to disparities between US states, general inequality between citizens will fall to quite a low level (Popov, 2014a; Jomo & Popov, 2016).

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Essay

The Donkey and the Thorn Tree: Reappraising Globalisation and Africa

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Abstract: Africa is vulnerable to a perfect storm which comprises a burgeoning youthful population, insufficient infrastructure, benign donor neglect and more malign foreign interference, much of which can be traced to decades of weak economic performance. African excuses for such failure have focused largely on external factors. But countries from similar domestic environments and in the same world order across Asia, Europe and Latin America have developed in leaps and bounds. This would suggest that, for at least some countries, Africa is poor because its leaders have chosen the wrong path. This essay provides a reappraisal of globalisation vis-à-vis Africa, arguing that the continent does not have too much globalisation, but too little in the form of open competition for business and markets, and that politics, not economics, is the principal development impediment. Examples on the continent (Somaliland) and elsewhere (Singapore) illustrate what impact effective politics can have, highlighting that a major challenge for Africa is an inability to create regional exemplars of prosperity that other states can emulate and feed off in a positive cycle of development. To this end, getting the (democratic) politics right in Africa makes good development sense.

Keywords: globalisation; political economy; sub-Saharan Africa

JEL Classification: F63

1. Introduction

Thomas Friedman produced *The Lexus and the Olive Tree* in 1999, on the cusp of the new millennium. A pro-globalisation tome, Friedman argues that technology has connected the world, making it 'flat', allowing greater input and participation from outside the developed world, or the West (Friedman, 2012).[1]

The Lexus and the Olive Tree is based on an idea that the age of the nation state has ended and has been replaced by 'globalisation'. The Lexus is taken to symbolise the drive for prosperity and global homogenisation (for which read consumerism), and the Olive Tree that of traditions and identity. Friedman posits that these two contradictory pressures should be in balance in order for the world to progress. This global transformation was already underway when Friedman, a celebrated *New York Times* columnist, wrote this book. Indeed, he argues that the global arena includes more input and contributions from nations outside the 'industrialised West'. This is particularly the case in Asia, which has seen its share of global per capita GDP increase from around half to more than the global average. And yet, as shown in Figure 1, Africa's share of global per capita GDP has fallen during this time to around 15%.

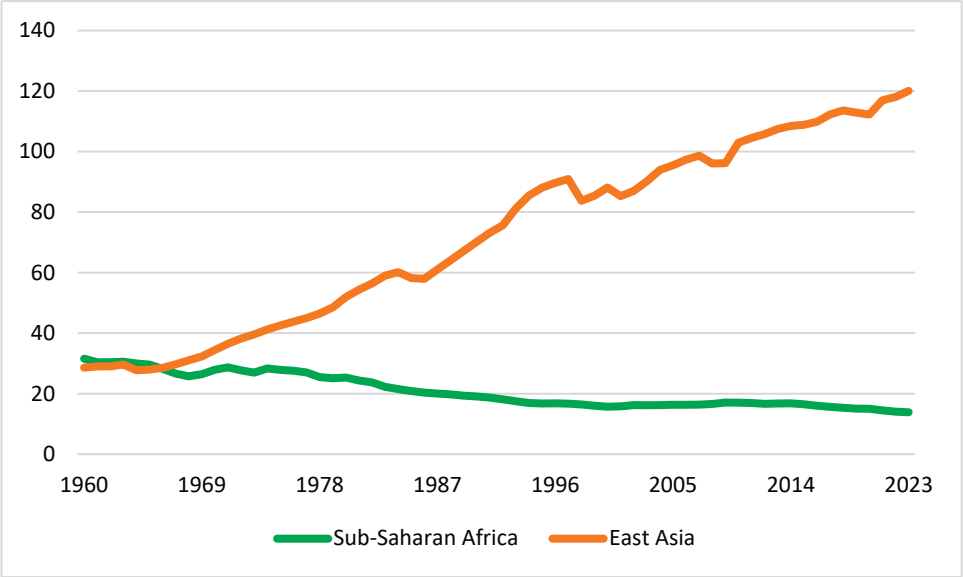


Figure 1. Share of World GDP Per Capita (%). Source: Authors' calculations using World Bank data.

As a consequence, Africa is today the repository of the world's poor. Even before COVID-19 struck in 2020, one-third of Africans—445 million people—lived in extreme poverty (living on less than US$1.90 a day), a figure which increased by 30 million two years later, a figure nearly ten times the average for the rest of the world. Africa has 22 of the world's poorest 25 countries.[2]

If Africa had managed nothing spectacular in terms of economic growth but had only been able to retain its comparative global position of 60 years ago, the income of the average sub-Saharan African would have grown (in real terms) threefold from USD 1135 (in 1960) to USD 3475. Instead, the average African per capita income is today USD 1597. During this time, average global wealth has leapt more than 300% to USD 11,010, whereas Africa's has increased by just 40% in real terms.

Instead, now, the wealth of Africans is but a fraction of their global peers and continuing to fall. This reality, coupled with demographic changes, might have dramatic political consequences unless something changes. Business as usual offers no solution. Africa will experience an extraordinary population increase in the next generation, the continent being projected to increase from 1.3 billion to over 2.5 billion people by 2050. The business-as-usual approach taken by donors and Africans alike is simply not going to suffice. The swell of young people, and their demands and possible anger, will likely create a sense of urgency. As the 2022 African Youth Survey illustrates, more than half of young people in Africa, aged 18–24, are likely to consider emigrating in the next few years, citing economic hardship and education opportunities as the top reasons. Just less than one-third of those polled across 15 countries felt their country was headed in the right direction (Ichikowitz Family Foundation, 2022).

But emigration is not necessarily the solution for those young Africans in search of greater opportunities and improved livelihoods abroad given the barriers associated with it and the difficulties many endure when attempting to assimilate to their new homes. While the European migration crisis of 2015 does not accurately represent African migration in its entirety—for example, in 2020, an estimated 21 million African emigres remained on the continent compared with 19.5 million who lived abroad—it does offer a glimpse into the dangers associated with such endeavours and the impact it can have on host countries, not least their political landscapes.[3] Africa's youth, it would appear, are stuck between a rock and a hard place.

Even if globalisation has ushered in an era of global growth and, through China in particular, the upliftment from poverty of more than a billion people in a single generation, why is it so difficult to translate these lessons and replicate the elements of success from one situation to the next?

The polymarble statue of Sir Thomas Stamford Raffles was erected on Singapore quayside in 1972, on the spot where the man considered the founder of modern Singapore is believed to have landed 150 years earlier. The white statue is a copy of the original bronze figure now just a short stroll away in front of Victoria Memorial Hall. Sculpted by renowned English artist and poet Thomas Woolner, the bronze edition was unveiled on Jubilee Day on 27 June 1887.[4]

Dozens of African delegations visit Singapore every year to learn from the island's success in transforming from a (real) per capita GDP of USD 4214 to USD 67,360 since its independence in 1965. Singapore's share of global per capita GDP has increased from slightly below the global norm of USD 4257 in 1965 to now being six-times greater than the 2022 average of USD 11,315. Singapore's GDP is, at USD 380 billion, now slightly more than South Africa's, though its population is ten-times less. In 1965, South Africans were, on average, ten percent wealthier than Singaporeans.

It is not as if the costs of the failure to follow a similar reformist path to Singapore is missed on African leadership.

Raila Odinga was the Prime Minister of Kenya from 2009 to 2013. Before and during that time he headed Kenyan delegations to study Singapore's success. 'It seems extraordinary today that in the 1960s Singapore looked to Africa for insight on growing its economy', he recalls. 'In 1968, a team of Singaporeans came to Kenya to learn our lessons, since we were then a more developed country than they were. Four decades later I led a study trip to Singapore with six ministers. That was the latest in many trips taken by the Kenyan government to the island, about which no report was ever written, and where the participants kept everything to themselves … This, I am sure, is the depressing experience of many an African government official and politician. Lots of studies, followed by much less in the way of action' (Mills et al., 2020).

There are many good lessons to be extracted from Singapore, not least embracing the past, but also the willingness to make tough decisions and maintain attention to detail, which require a combination of sound leadership and a highly capable, meritocratic civil service. Corruption is severely punished, quite the contrary to most African and other Asian political economies and, fundamentally, (economic) growth matters. If, for example, Africa had increased its wealth at the rate of Vietnam, which had a difficult passage to independence, it would be touching the global average instead of being seven-times less.

And if it had grown at the pace of Singapore, Africans would be twice as wealthy as the global average.

If there is one key lesson to be taken out of Singapore, it is about pragmatism in running government.

It is not about the need for more time, since most African countries have been independent longer than Singapore. Lee Kuan Yew might have been Prime Minister for three decades but his duration was long because delivery was impressive. If the latter had been poor, it is doubtful LKY would have lasted, whatever his authoritarian tendencies.

Geography and the neighbourhood have helped, but it was not so for a long time—there was a time when the region was defined by wars, from Korea to Vietnam. China's poor performance was a blight for the first 40 years of the existence of the People's Republic. This is also not because Singapore managed to stay out of the clutches of nasty multinationals; to the contrary, Singapore actively has gone out to attract these businesses into the country, given their role in introducing skills, technology, finance and, crucially, knowledge and

practice of markets. The number of multinationals has been a key and longstanding metric of success. Central to achieving this has been Singapore's openness to external advice and ideas, typified by the 25 years of (unpaid) work of Dutch consultant Dr Albert Winsemius, which, among other achievements, provided the early plans for developing the city state's economic base.[5]

It is not because of the relative absence, either, of neo-colonialism, however that may be defined, since America and the West have maintained a steady presence since 1945. Again, the role of Western companies and countries has been actively encouraged, on Singapore's terms.

Why, when we know how Singapore, among others, did it and where the island came from, do African (and other) leaders choose to (largely) ignore its lesson of the need for leadership at every level, including the need for a highly professional civil service?

The questions about the spread of globalisation as an operating principle applies also to politics. Friedman also put forward a capitalist peace theory in *The Lexus and the Olive Tree*, first published in *The New York Times* in December 1996, called the 'Golden Arches Theory of Conflict Prevention', stating that no two countries that both have a McDonald's have ever fought a war against each other; that when a country has reached that point of economic development with a sizeable middle class, it would not be interested in fighting wars. Of course, Russia's invasion of Ukraine has disproven this theory, and restated the role of leadership and tradition in managing affairs of state.

2. Values and Globalisation

The war in Ukraine, and the technological changes illustrated at the operational and tactical levels on which analysis so often dwells, must be understood overall within the context of a shifting grand-strategic or geopolitical landscape—one in which the assumptions of the last 30 years no longer seem to hold.

At the beginning of that 30-year period, Francis Fukuyama's 1992 *The End of History and the Last Man* predicted the global triumph of political and economic liberalism. The book expanded on Fukuyama's essay 'The End of History?', published just months before the fall of the Berlin Wall in November 1989, in which he wrote 'What we may be witnessing is not just the end of the Cold War or the passing of a particular period of post-war history, but the end of history as such: that is, the end point of mankind's ideological evolution and the universalisation of Western liberal democracy as the final form of human government'.[6]

The fall of the Berlin Wall paved the way for a Europe 'whole, free, and at peace', a vision set out by President George H.W. Bush in Mainz, Germany, on 31 May 1989. The collapse of Soviet hegemony in Europe quickly delivered a remarkable outburst of freedom and prosperity, a success story for Europeans from Narva in the Baltic to Constanta on the Black Sea.

Then, at the start of the 1991 Gulf War, President Bush expressed the threat posed by Saddam Hussein in terms of risks to a New World Order. In a speech to a joint sitting of Congress on 29 January 1991, the president said that 'what is at stake is more than one small country; it is a big idea: a new world order, where diverse nations are drawn together in common cause to achieve the universal aspirations of mankind—peace and security, freedom, and the rule of law. Such is a world worthy of our struggle and worthy of our children's future'.[7]

For a while, such a new order seemed possible, even probable. The countries of the Warsaw Pact quickly moved to liberalise and democratise, escaping the political repression and economic claustrophobia of the Soviet era. The Soviet Union itself collapsed at the end of 1991 and a new Russia emerged, more democratic and more open to the West. China had earlier liberalised its economy, though as the 1989 Tiananmen Square massacre and

subsequent widespread repression demonstrated, it was far from a liberal society. East and West Germany unified, and it seemed globalisation would allow humanity to leave behind a divided world and the deadening isms of Marxism, socialism and the competition with capitalism.

Yet this process was incomplete, where states were orphaned by diplomatic and strategic delinquency, by a failure to fully include, and a failure to permit them the resources to maintain their own course. In this way, the Ukraine episode should be considered as part of the failure to transition effectively from war to peace at the end of the Cold War.

And then the wheel turned—to an era of increasing great power competition, where populism and authoritarianism took the place of other past, competing 'isms'. Critics contended that Fukuyama was wrong, in that subsequent history turned out far differently from his prediction, and that he was incorrect too in celebrating American-style democracy as the ultimate form of government. But Fukuyama, who served in the US State Department's policy planning section before reverting to academia, has written that it was more the model of the European Union and its version of transnational power than America's 'continuing belief in God, national sovereignty, and their military' that he had in mind.

Others criticised *The End of History* because it failed to note the rise of ethnic and religious loyalties that would replace ideological divisions as a source of disorder. Harvard academic Samuel Huntington's 1993 essay (and 1996 book), *The Clash of Civilizations*, argued, for instance, that the conflict between ideologies would be replaced by a more prosaic and enduring conflict among civilisations. The events of 9/11 gave prominence to this critique—the notion that history, in the words of one critic, had 'returned from vacation'.[8]

In some respects, it never left.

While nuclear weapons have shaped and limited war since 1945—creating escalation barriers to direct conflicts between the United States and Russia and constraining conflict between India and Pakistan, for example—they have clearly not eliminated it, even when superpowers are involved.[9] Rather, there is strong evidence that the presence of nuclear weapons has diverted conflict among great powers into other channels including insurgency, hybrid and proxy warfare, and grey-zone conflict. And in any case, the nature and effects of war remain the same.

Even in the bitter Russian invasion of Ukraine, with its ongoing conventional war on several fronts costing hundreds of thousands of lives, nuclear weapons have remained taboo, perhaps because using them would widen the conflict to include active participation by NATO.

No matter the disillusionments of the past three decades, and no matter how quickly the elder Bush's 21st-century vision was betrayed by political reality, the hope for a more just world remains, particularly in an environment of instant information and media flows.

A common vision has been made possible by the speed and extent of global mass media. This, too, has an impact on political decision-making. It is worth reflecting on the political consequences if it had been possible to post on social media from Omaha Beach in real-time. Would D-Day have been called off before noon? In Ukraine, Israel and Gaza, real-time footage drives a swathe of social media opinion long before policy makers have reflected on the conflicts. Rushing to conclusions has never been easier but it also belies introversion on the part of information consumers. That many opt for the echo chamber of their choice rather than diversity of opinion says something about human nature, cognitive overload and the mental bandwidth savings involved in reinforcement of prejudice and introspection rather than greater understanding and diversity of options. The changing nature of publicly available information has made attempts to manage narratives by politicians much more difficult because of the media landscape decision-makers have to navigate as well as its social impacts.

Twenty years ago, it was not easy being an autocrat (Mills, 2024b). No longer could they easily turn to violent methods and blunt weapons to keep people under their thumb, as Stalin had done in sending perhaps as many as ten million of his countrymen and women to their deaths in the gulags, through executions and engineered famines; or as Mao had done with his Great Leap Forward and Cultural Revolution, which together cost as many as 35 million lives. Right-wing dictatorships ended with the collapse of the Metapolitefsi in Greece and the death of Franco in Spain in the wake of events in Lisbon, followed by junta after junta in Latin America. Then came the collapse of the East Bloc governments in Eastern Europe after 1989.

After the end of the Cold War, there was a surge in democracies as the number of countries classified as 'free' increased from 56 out of 165 in 1987 to a record 81 of the world's 191 nations qualified as free[10]—the highest number recorded in the then 25-year history of the survey. With the end of the Cold War, many of the repressive regimes had lost their principal sponsor in the form of the Soviet Union and eventually succumbed to their peoples' wishes for greater openness. With the advent of social media, for a while, the costs of tyranny were raised to unprecedented levels.

In Africa, two-thirds of those polled by Afrobarometer[11] consistently prefer democracy to other forms of government, including 43% in South Africa, 47% of Angolans, 75% in Zimbabwe, 79% of Tanzanians, 49% in Mozambique, and 55% of those polled in Namibia. The longer you have tasted one-party rule the more you appreciate democracy.

But autocrats quickly learnt to adapt, keeping the shell of democracy in place after hollowing it out by removing free and open political contestation. As a result, global liberty declined for the 17th consecutive year in 2023 according to Freedom House, which has been charting these trends for half a century.[12] Freedom of trade is increasingly constrained, as economic decoupling between China and the United States takes hold, and with the widespread imposition of sanctions against Russia following its full-scale invasion of Ukraine. Democracies now inhabit a world, as the British Member of Parliament Tom Tugenhat has noted, 'where multilateral institutions can no longer provide the stability or security they once promised'.[13] This weakness of course does not only apply to Western democracies. As Hanna Maliar, then Ukraine's deputy minister of defence, told us, 'the main lesson between 2014 and 2022 is that all the instruments elaborated since World War II are not working anymore'.[14]

This may help to explain why, for instance, despite unprecedented levels overall of global prosperity, today conflict rages in parts of sub-Saharan Africa, North Africa, the Middle East, South Asia, and Central Europe.[15] There are other, worrying longer-term trends. Anthony Cordesman writes of 'winter wars', which include nuclearisation, the arms race, terrorism, population pressures and threats from 'fragile, divided, authoritarian, and undeveloped states', along with regional areas of tension including the Koreas and North Africa in addition to those already mentioned.[16] The contemporary simultaneous nature of the threats is unusual, perhaps unique. One senior European intelligence official of a southern Mediterranean country summarised the 'threat vectors' facing Europe from the Sahel as the combination of jihadism, weak domestic governance and widespread corruption, economic collapse worsened by climate change, ethnic division and its corollary in nationalist struggles, and an exploding demography coupled with an external spark in the form of the Israeli–Palestinian conflict along with foreign interference, both directly and indirectly through influence operations and contestation over supra-national structures including the United Nations. As a consequence, he said, the Sahel region, which will hold a population of 330 million across its 12 nations by 2050, double what it is today,[17] 'is on the brink of becoming a failed macro-state'.[18]

Such an existentialism is rising as the business-as-usual premise of most African leaders in the face of a galloping demography rings hollow. It is one thing to kick the reform can down the road with at least another billion mouths to feed in Africa by 2025. The rash of instability currently in the Sahel offers a window into the dystopian consequences of inaction.

This setting demands a hard look at how we got to this point, and how the failure of external policies has contributed.

3. The Donkey and the Thorn Tree[19]

A dirty, white, bullet-pocked house, without electricity and running water, does not merit a second glance in the town of Burao, high in the east of Somaliland. Yet, this former colonial governor's residence, shaded by a giant acacia, was the site of the Grand Conference of the Northern Peoples in Burao, held over six weeks, which concluded with the declaration of Somaliland's independence from Somalia on 18 May 1991. It is a hard-scrabble environment, with life on the outside characterised by pastoral livelihoods, goats, donkeys and camels, with little more than dust and thorn trees, and inner workings dependent on flows of remittances.

Since 1991, however, despite the poverty, and the continued political and security difficulties in neighbouring Somalia to the south, Somalilanders have stuck with a winning formula, despite the absence of international recognition and the tepid democratic enthusiasm of much of the Horn of Africa. Only, Somaliland, among the Horn of African countries, is not ranked as 'unfree' (with a score of 43/100, where 100 is the maximum 'freedom' achievable) on Freedom House's political rights and civil liberty rankings. Ethiopia (20), Djibouti (23) and Somalia (8) are all listed as 'unfree', the same status as Uganda (34), Rwanda (23), Burundi (14), Egypt (18), Sudan (6), South Sudan (1) and Eritrea (3) in the next regional ring. Only Kenya (52) to the south, like Somaliland, enjoys 'partly free' status.[20]

Whatever the extremes of donkeys and thorn trees, Somaliland uses representative democracy to keep its 6 million people and diverse clan system together.

Its steady democratic performance and progress is a breath of fresh air in a continent that, by comparison, is an uphill struggle for democrats. Only nine African countries of 54 were, by 2023, in the 'free' category. This is the lowest figure since 1991, with just 7% of the continent's population thus living in countries classified as 'free'.[21]

The reasons are simple. Incumbents have little interest in changing things, even though a vast majority of Africans regularly polled prefer democracy to other forms of government, despite the popularity among elites of the big-man thesis.

Somaliland also shows that you do not have to be rich to be democratic. Despite a tiny national budget of just USD 250 million for its 6 million people and a tough geography and hostile climate, Somaliland is showing much richer countries how to do it.

'A place that has made something out of virtually nothing' is how the former Nigerian president, Olusegun Obasanjo, describes the progress made by Somaliland. His trip there in May 2019 was the first by an African president, current or past, since the territory re-declared its independence in May 1991.[22]

In June 1960, Somaliland gained its initial independence from Britain before making an ill-fated decision to join former Italian Somalia five days later in a union that was envisaged ultimately to include French Somalia (now Djibouti), the Somali-dominated Ogaden region of Ethiopia (now Region 5) and a chunk of northern Kenya—the regions denoted by the five-pointed star on the Somali flag.

In the centre of the capital, Hargeisa, is the independence memorial, comprising a MiG-17 fighter-bomber erected on a plinth. This commemorates the event when, having lost control of the province, Siad Barre—the third president of Somalia—ordered his air force, operating

from the local airport, to bomb the city, which had been briefly captured by the local Somali National Movement (SNM) liberation fighters in May 1988. Flown by Rhodesian mercenaries, among others, this resulted in many thousands of civilian casualties.

By the time of Siad Barre's fall three years later, the main cities of Hargeisa and Burao had been razed to the ground. Not for nothing was Hargeisa known as the 'roofless city' after systemic looting by Mogadishu had stripped it of roof sheeting and even doors and their frames.

Somalilanders have since sought stability on the principle of maximum ownership and the reality of minimum resources.

Peace did not require vast external financing; there was none available anyway at the time. In fact, the absence of outsiders, namely foreign governments, may be precisely the reason for its success, at least compared to its southern neighbour, Somalia, which has lurched violently from peace conference to initiative, peacekeeping mission to external military intervention, and from failing government to fragile coalition, seemingly with little discernible progress. In Somalia, 'conflict entrepreneurs' have fed off both the fighting and the talking in a top-down process financed by donors and mostly taking place outside the country.

Somaliland's peace conferences were, by contrast, managed and financed by locals, bringing their own food and shelter. The last conference in 1993 was held over five months under the trees in the western city of Boroma, on the border of Ethiopia.

Such dialogue, long a feature of Somaliland society, was organic and bottom-up rather than top-down. Somalilanders concentrated on achieving peace, not on acquiring comforts and financial rents for delegates from a peace process. Despite its obvious dysfunctionality, Somalia somehow refuses to countenance Somaliland's right to divorce, clinging chauvinistically to the notion that the marriage can be repaired. And Africa blindly stumbles on with hopes for reunion and fears of the wider impact of accepting the current two-state reality.

The recovery since has similarly demanded persistence and the principle of inclusion.

The former British protectorate has developed a stable, democratic system of politics, merging modern and traditional elements. In 2002, Somaliland made the transition from a clan-based system to a multi-party democracy after a 2001 referendum, formalising the Guurti as an Upper House of Elders, which secures the support of traditional clan-based power structures.

There have since been regular elections and a frequent turnover of power between the main political parties. The 2003 presidential election was won by Dahir Riyale Kahin by just 80 votes in a poll of nearly half a million, defeating Ahmed Mohamoud Silanyo.

The tables were turned in 2010, with Silanyo winning 49% of the vote to his opponent's 33%. Muse Bihi Abdi, a former SNM fighter, who had earlier served as a Soviet-trained fighter pilot in the Somali Air Force, was elected in November 2017, receiving 55% of the vote, becoming the country's fifth president and cementing a tradition of peaceful handovers of power that are rare in the region.

On 31 May 2021, around the 30th anniversary of Somaliland's independence and the 20th anniversary of its multi-party democracy, and despite COVID-19, the parliamentary and local district elections went off smoothly, with 1.1 million voters registered by the National Electoral Commission (NEC) and the establishment of 2709 polling stations countrywide.

Unlike Somaliland's previous six elections, which were mostly funded by outsiders, 70% of the USD 8 million budget was financed internally. And despite delays in the election, caused by a standoff between the presidency and opposition parties over the nomination of members of the NEC, and challenges with the iris biometric voter registration system,

this was the most competitive poll yet, with 246 candidates standing for 82 parliamentary seats and 966 for 249 district municipality posts across the six regions.

A lack of wealth does not mean instability. Somaliland is synonymous with grinding poverty and dirt-scrabble hardship. A high percentage of the population is illiterate, requiring assistance at the polls, many of which were run by university students. The slow pace of voting was accompanied by constant grumbling on a high Somali volume setting, but with no violence or obvious intimidation.

Regardless, the enthusiasm was palpable, not least among the very old and young. Preference was patiently given to disabled and women voters. A voting age of 15 might seem low, and a cynical way of vote-stealing, but it serves as a de-radicalising mechanism for the largest demographic; 70% of Somaliland's 3.5 million population is under the age of 30. The younger generation sees democracy as a means of diluting the impact of the clan system. The crowds were not voting just for political parties, they voted for nationhood and the pride of self-determination.

Somaliland has relevance for those outsiders seeking to get insiders to do their jobs better, and in recognising the imperative of a local peace and ownership to get things done. Somaliland's commitments to improving democratic norms and standards, and its regular change of leaders at the polls, have made it a regional democratic superpower. Rather than trying to manufacture success in Somalia, outsiders would be much better off recognising Somaliland and reinforcing domestic success where it already exists.

As President Muse Bihi Abdi says about the Somaliland approach, 'One of our advantages was that we had a local constitution'. The bottom-up success of Somaliland contrasts with the top-down failure of the Somali model. 'Aid', he says, 'can be a curse, depending on how you use it'.

Despite its considerable aid effort, no matter the administrations in power in Washington or across Europe, the West has consistently found itself on the back foot in its relations with Africa, both on the continent and in building partnerships in multinational organisations such as the United Nations, losing ground to its strategic rivals in the process. Moreover, the slow improvement of African governance and democracy also suggests that such aid programmes are wrongly premised and executed.

The most remarkable aspect about aid is that, despite USD 500 billion being expended in Africa in this way since the end of the Cold War and there being very little to show for it (measured in terms of economic wealth), the system of giving has scarcely changed. There is an imperative now to do so, however, since business as usual risks failure on an even grander scale (using migration as one metric, for instance) given Africa's changing demographics. Moreover, the West has, for all of the above reasons, been reluctant to apply conditions to its aid giving, worsening rather than strengthening governance given that elites are buffered against failure at one level while undermining the very values that Western liberal democracy supposedly holds dear—open markets and open societies.

One reason for the relatively poor development performance of donor aid to Africa since independence is because African elites are willing to take the money and never carry out their part of the bargain in terms of reforms. In part, this is because they routinely have not felt the groundswell of popular discontent at the polls, and aid can in fact buffer these political pressures by removing or distorting the link of accountability between populations and their governments.

To a degree, this reflects both the apathy of populations and the extent to which they can be bought off or divided by rulers, and how African leaders have figured out how to manage democracy (read elections) without losing power and without risk of censure domestically, or worse, from outside. An African version of the 'Beijing Consensus' (or 'Putin Consensus') has emerged, offering elites relatively untrammelled access to

economic spoils without the threat of political change. Unlike East Asians, Africans have not organised themselves enough to demand structural growth sufficient to enable societies to go from rural to urban and peasant to middle class in a generation.

Conditionality on aid, leveraging economic assistance with governance conditions, has also predictably been successfully repelled by African leadership as an unwarranted intrusion in the domestic affairs of aid recipients, and in the process successfully linking governance reforms to the colonial history, ensuring the West is as much a prisoner of its past as African populations. The efficacy of conditional aid is closely linked to recipient countries' levels of democratic freedoms, as research has shown with the IMF and World Bank programmes (Montinola, 2010). That the freer the country generally the better the development outcomes is fundamentally unsurprising, given the correlation between democracy, judicial efficiency and independence, and policy openness, thus encouraging investors, both local and foreign, and driving growth.

To this end, any new development approach to Africa should seek to play to Western strengths in terms of democracy and open markets and, thereby, align itself with the majority of African populations which prefer such systems.

Unlike the record in East Asia, the clear empirical correlation between standards of democracy and growth performance in Africa suggests that getting the (democratic) politics right makes good development sense. Any foreign engagement that ignores the moral economy and puts profit before people and financial reward before human rights is designed to fail, at least in terms of building a relationship between the recipient governments and their populations.

There are advantages to incentivising better performance by African partners. For example, categories of donor assistance could be more explicitly linked to governance and democratic performance, while at the same time ensuring those at the 'poorer' end of the scale do not fall off completely.

All this matters for Africa, where countries are vulnerable to a perfect storm of a burgeoning youthful population, insufficient infrastructure, benign donor neglect and more malign foreign interference.

This has its roots in decades of weak economic performance. That is not to say things have not improved—they just have not improved at the same rate as the rest of the world.

African excuses for such failure have focussed, understandably from a political vantage, on external factors. Change the world, and the unfair and uneven distribution of benefits, so the argument goes, and Africa can prosper. By this thesis, increase aid, make the world an easier place in which to do business, and Africa can change.

But from similar domestic environments and in the same world order, countries across Asia, Europe and Latin America have developed in leaps and bounds. This would suggest that, for at least some countries in Africa, they are poor because their leaders have chosen the wrong path, and that repressive politics, not poor economics, is the principal development impediment.

Examples of African failures to reform and diversify abound. The strategic challenge which has led to systemic micro-, tactical-level disappointments in African development rests fundamentally in the inability to break out of the colonial model of economic extraction and growth. Rather than liberating the economy of its protections, monopolies, frictions and inefficiencies, post-colonial African regimes simply replaced one elite with another and maintained the same extractive, commodity-heavy model as their colonial forebearers. In this they were encouraged, aided and abetted by external powers and interests who had too a vested interest in the continuation of the relationships, both inward in terms of goods and outward for commodities, earlier established.

And as problems of slow growth, weakening governance and social instability took hold in the post-colonial era, the response was to undo constitutional bounds and tighten the reins of power, leading to repression and ever greater violence, including military coups, in response. The Cold War provided greater political wiggle-room as countries manoeuvred in soliciting superpower patronage, though this amplified the focus on power and control rather than growth and development. As the Cold War waned, so democracy waxed as authoritarians had fewer options (and excuses), and the pressure for change and rights grew and became a concern for some outside power and less impeded by others. But the narrowing of ideological options and strengthening constitutionality still fell foul to the entrenched, vested interests operating in the half-light of government enterprises and boards, the bureaucracy and crony capitalist schemes. And so African growth has not reached the heights required for its burgeoning youth, in the main because government has not made the policy decisions or allowed the space for business to grow. Small- and medium-sized businesses are the backbone of the global economy, accounting for one-third of GDP and 45% of the workforce in high-income countries and 98% of employment in the Asia–Pacific region.

There is upside in Africa's relatively weak development performance; demographics will, for one, drive demand and direction insofar as businesses will pivot production towards markets where labour is more affordable. Europe and Asia's aging populations combined with increasing wage expectations could result in as many as 150 million jobs being up for grabs by Africans, even with reskilling, the *graying* of the workforce elsewhere, and substitution by automation.[23] China's manufacturing boom grew six-fold between 2004 and 2017, for example, to USD 3.5 billion, or one-quarter of the world's manufacturing base. Yet real wages also increased by around 10% between 2005 and 2014. Moreover, China is now moving from light manufacturing for exports toward diversification into services and higher technology.[24]

Africa will, however, have to position itself to gain this investment and employment, or these jobs could be filled by migrants in Asia and Europe. There are challenges. For one, Africa is not a low-cost environment both in terms of wages and the costs that influence investment, such as the quality of roads and ports, the extent and reliability of electricity infrastructure, political stability, and the level of excessive bureaucracy and corruption. Encouragingly for Africa, the formula for doing so, for doing things better, is hardly unknown, not least given Asia's recent economic transformation.

Second, the political economy will have to shift from one of extraction to inclusion, where policies are pursued in the interests of the wider population rather than the elite.

The performance of Asian countries has been remarkable over the last 75 years, starting with Japan and progressing through the four Tigers (Singapore, South Korea, Taiwan and Hong Kong) through the rest of the ASEAN region. This history could have been vastly different if leadership had made choices shaped by their past. Instead, Asian countries generally exemplify many of the steps others seeking fast-paced development should take, and the pitfalls to be avoided, as summarised in Table 1.

This is not an irrelevant template for Africa, though the question is why does it not follow these lessons? The answer lies in understanding Africa's political economy. This term, 'political economy', describes the relationship between government economic policy choices and people—how the state affects the market and, subsequently, peoples' livelihoods.

Table 1. Lessons on Development from Asian Countries.

#	What To Do	What To Avoid
1	Listen to business	Favour elites
2	Ensure openness	Mistake trading for a means to develop
3	Instil the basics—political and macro stability	Seek silver-bullet solutions
4	Boost agriculture yields	Focus on land alone as the solution
5	Prioritise necessary infrastructure	Adopt high-debt infrastructure-led growth
6	Invest in education and skills	Close avenues to outside talent
7	Pursue growth as an inclusive agent	Ignore the environment for the next generation
8	Improve productivity	Fail to improve the quality of life
9	Attach laser-like focus to job creation	Look to the state as the only solution
10	Use evidence to act fast and decisively	Be a prisoner of your past

Source: Authors' construction.

4. A Political Economy of Exclusion[25]

Across Africa, the political economy has been described as 'rentier'—where the economy relies on extracting income from rents, usually from foreign entities, rather than developing through improving productive capacity and competitiveness. As the World Bank describes with respect to Malawi, for instance (World Bank, 2018), 'Malawi's stagnation is in large part driven by a stable but low-level equilibrium, in which a small group of elites compete for power and political survival through rent seeking. The competitive-clientelist political settlement creates strong incentives for policies that can be seen to address short-term popular needs (such as agriculture subsidies, market and price distortions), while undermining the ability to credibly commit to fiscal discipline and long-term reforms needed to spur productive structural transformation'.

Essentially, the elite shapes policy choices and practices in a manner that enriches them before all others. This can take multiple forms, such as procurement contracts. Maintenance contracts on South African power-stations would be an example, or the coal contracts that drive dependency on that system of power and enrich the middle-men, many of whom have close connections with the ruling party. Another example is in terms of import substitution, where high tariffs on foreign goods penalise the poor while ensuring a local elite gain uncompetitive market share. The same applies to local ownership or, in the case of South Africa, racial ownership stipulations, ensuring a politically protected class. Fixed exchange rates are another method, such as in Nigeria and Ethiopia, where the difference between the government and the market rate creates the conditions for local arbitrage, essentially enabling elites to buy at one (fixed) rate and sell at another (market) price while, at the same time, reducing the competitiveness of exports. In Malawi, cited above, this takes the form of state intermediation in agriculture pricing while preventing exports, ensuring the price to the farmer is low. In one of the most egregious forms of exploitation, the produce is stored and then sold back to the farmer at a higher price later in the season, when hunger bites.

The list is endless. The engineered failure of railways to drive road transport monopolies to fuel importers benefitting from the collapse of power grids; rents from the ownership of a resource (such as oil) to the political engineering around both the volume and the distribution of aid especially emergency humanitarian assistance; and the transit charges and systems of fuel and agriculture subsidies. As Douglas Yates puts it with regard to oil

(Yates, 2015), 'The rise and fall of these states is more than just another boom-and-bust cycle of resource dependency. Instead of cultivating an ethic of hard work, oil rentiers follow an easy path to quick riches, spending money which they have not earned. The more eagerly they spend their unearned oil revenues striving to reach development, the farther they recede from it'.

The problem is clear. Not only does the existence of these systems hinder development progress through improving productive capacity, it has a negative impact on the development of open political systems. While elites are reluctant to give up their preferences, in an unhealthy development pact, the relative absence of taxation as a means of state income makes citizens less demanding and politically engaged. Perhaps the most astonishing aspect of Nigeria's abject economy is that government revenues (including from oil) are around just 6% of GDP compared to the global norm of 13.5% or the developed world norm of 15.3%.[26] Nigeria's rate is amongst the lowest in world—virtually implying anarchy—but, in fact, is the minimum required to ensure access to patrimony flowing from control over various aspects of the economy. And this is way too low to enable the state to invest in and look after the people.

Nigeria is Africa's largest economy, though it ranks just 133 out of 184 in terms of GDP per capita (at USD 2429). This reflects low growth and a rapid increase in population, having increased from 45 million at independence in 1960 to 215 million 60 years later. Now four out of ten Nigerians live below the poverty line (World Bank, 2022), and many—especially in the north—lack education and access to basic infrastructure including potable water, electricity and sanitation. Most are engaged in subsistence activities, with just 17% holding wage jobs.[27] Young people under the age of 35 comprise 76.5% of the population, yet politics are notable for low levels of youth participation and representation. There is endemic insecurity in parts, especially in the north-eastern states of Adamwa, Bauchi, Borno, the Federal Capital Territory, Gombe, Nasarawa, Taraba and Yobe due to Boko Haram, which had produced 3.3 million internally displaced people.

It is a governance system that incentivises corruption. Take Mohammed, a young immigration officer based in Lagos. He earns USD 400 per month and spends USD 1500 annually on his accommodation, USD 10 per day on food, and USD 1 on transport to and from work. He has to make some money on the side just to survive, let alone prosper. A few steps from his desk, at passport control, the officer tapped a USD 10 bill under his computer keyboard. 'I need some help' he said, increasingly agitated.

Altering this political economy is difficult, requiring both strong leadership and a sustained effort likely over generations. For example, during the civilian administration of Obasanjo in Nigeria, between 1999 and 2007, the economic growth rate rose to 6.6%, two percentage points higher than the sub-Saharan average, helped by higher oil prices but also driven by improved governance and a strategy for debt relief. The growth rate for the ten years following was 4.7%, as politicians descended once more into rentier habits without a plan for recovery, reform and growth.

For all of the setbacks, Nigerians are today much more aware of their democratic rights and threats. The extent of electoral and political inclusivity—in terms of youth; gender; regional voting accessibility and patterns; registration; media coverage; cyber-integrity; voting technology; and voter education—is firmly on the agenda, representing a refinement of expectations and standards beyond simply holding elections per se, free of violence. This is reflected, too, in the increasingly sophisticated agenda of international observer missions beyond simply declaring elections 'free and fair'. The Nigerian election held on 25 February 2023 was an example of both the complexity of running polls in a large country with weak institutions and of an increasingly sophisticated electorate.

This poll required the establishment of 176,846 polling stations across the country's 36 states (plus the Federal National Territory around the capital) capable of processing 93.4 million registered voters involving 547 million ballot papers and more than one billion pieces of paper in total, with the mobilisation of 310,000 police officers and 94,000 other security officials plus 1.4 million election officials. As the chairman of the Independent National Electoral Commission (INEC), Professor Mahmood Yakubu, admitted, 'We understand the benefit of credible elections, not only in our own country in terms of peace and stability, but in terms of the ripple effect across the region'.

Nigeria has much going for it, including a dynamic media environment (with more than 100 television and nearly 200 radio stations in 2019) and a high-energy population which constantly finds ways to get around the lack of institutional capacity. 'No water, sink a borehole. No decent education, send your children to private schools. Get sick, fly out of the country. With lockdown, people are no longer cushioned from bad governance', says Aisha Yesufu, a Nigerian human rights activist.

Not for nothing is it said that in Nigeria things 'collapse into place'.

On the flip side, the corruption, violence and vote-buying surrounding the elections and pervasive '*e mi lo kan*' politics, translated as 'it's my turn now', along with the dynastic and corrupt practices that go with this sentiment, are synonymous with the democratic process, while representation remains skewed in favour of vested interests. 'Democracy has been commercialised' notes Emanuel Njoku of Connected Development, an NGO promoting government accountability. Parties pay scant regard for imposed limits on spending of USD 7 million for presidential candidates, and donations more than USD 7000 per individual. The chairman of the People's Democratic Party (PDP), the main opposition in the 2023 election, Iyorchia Ayu, says 'Funding limits are observed more in the breach than compliance. If you were able to stick to them you would not actually be able to run any elections … No serious political party observes these limits'.[28]

There are also issues of representivity; just ten percent of all candidates were women in 2023, for example, well below the global mark of just above one-quarter of all parliamentarians. While 18 to 35 year olds comprise more than half of total registered voters, Nigeria's past five democratic elections are notable for low levels of youth participation as candidates. Students comprised the largest single voting bloc, with 26 million registered, almost twice the number of the second largest constituency, farmers and fishermen at 14.7 million. Still, the use of biometric voting (facial and fingerprint recognition) technology boosted confidence in the voting process.

Take Kano, Mohammed's home town, Nigeria's second-largest city after Lagos, located at the edge of the savanna and on the trans-Saharan trade route. Politically it is better known as the birthplace of two military heads of state—generals Murtala Mohammed, the military leader in 1974–1975, and Sani Abacha, the last military strongman before the transition to democracy in 1999. Abacha has the dubious distinction of being involved in five of Nigeria's military coups—the 1966 'counter coup' along with those in 1975, 1983, 1985, and 1993, the last time before democracy returned.

A centre of the Hausa language, Kano's politics and past history of sectarian rioting plus the fear of rigging and exclusion in an environment of economic scarcity, constantly poses a threat of violence. The day before the election, three people were killed in a clash between APC and Kwankwaso supporters. On the day, however, 25 February 2023, all was relatively calm, though there were other problems. INEC turned up very late, some polling stations barely getting going just before the cut-off at 1430—a trend across the whole country. Many of the polling units were staged in the open, with the non-existent marshalling of the crowds and absence of many voting booths meaning it was, at best, chaotic. Problems of control were compounded by a lack of signage and basic facilities

including tables and chairs. Tallying was transparent but hampered by the lack of training and experience of the election officials and a lack of lighting for those who carried on into the night. The event was, in the words of one foreign observer, 'an extreme sport'.

The best conclusion on the process is that people who wanted to vote eventually got to vote; the biometric system worked and only a few people died. Of greater concern was the slowing of the transmission and release of results, usually a tell-tale sign that the rig is in. It is worth asking the following questions however: At what point is the credibility of the system compromised by myriad logistical problems, and to what extent were the problems encountered in the transmission of results deliberate? Second, if money politics and the ability to re-engineer tallies is pervasive, convincing even, and the means of remedy weak, what are the mechanisms then available to change the political incentives to reform? Having started out as bag-carrier for Chicago drug dealers and moving on to become the Godfather of Lagos, Tinubu was not going to let the Presidency slip from his grasp easily.

Samson Itondo of IYAGA Africa, the civil society group dedicated to the promotion of governance, says that there is, in this regard, a clash between the faith of Nigerians in democracy as an opportunity 'to reclaim the state, a stake heightened by the expectation that their vote will count' in a country 'polarised along ethnic and religious lines' compared to 'political actors who are still the same and playing by the same rules … and for whom this is their only chance to seize power'.[29] Though the opposition cried foul, the election was officially won by the ruling party's Bola Tinubu, an aging powerbroker who campaigned on a Muslim–Muslim ticket in a country divided equally between Christians and Muslims. Despite expectations to the contrary, the turnout was just 27%—lower than the 2019 election of 35%.

Thus, the question is moot.

Can the political economy be changed when it functions, albeit in a pernicious manner and when weak and predatory elites will fear the impact of attempts to change things? Politics is about agonisingly difficult choices, and often the inertia of the grave can overcome the desire for reform. Change is possible and can have a tremendously positive effect; witness the impact of liberalisation in the telecom sector. But when state operating systems are soaked in such methods, changing them is hard and requires tough-minded leadership with a plan and a mandate to carry out reforms. Good examples of change can also help. Can the international community be reshaped to assist?

5. Refocusing the External Environment?

The writer and activist Carl Ogelsby is credited with inventing the term 'global south' in an article published in 1969 by the Catholic journal *Commonwealth*. Writing in a special edition dedicated to the Vietnam War, he was describing centuries of northern 'dominance over the global south', creating what he described as 'an intolerable social order'.[30] The notion of the Global South has, in the years since this 1969 article, become a catch-phrase for the 'developing world', including parts of Asia, the whole of Africa and Latin America, Central America and bits of the Middle East.

The 'Global South' includes the world's second-largest economy, China, and many of the world's smallest. There are countries that have experienced remarkable economic growth, such as Singapore, Taiwan and South Korea, and others that have languished in the economic backwaters.

And, when it comes to political systems, there are democracies, autocracies, monarchies and theocracies.

Writing in the *International Politik Quarterly*,[31] Miriam Prys-Hansen summed it up as follows: 'There is neither agreement on who this Global South actually is, nor fundamentally

on whether the Global South exists at all, given the great heterogeneity and the dynamics of those who are typically classified within it'.

Despite this, however, the term 'Global South' is on the rise and has re-entered public life—but this time with a difference. Nowadays, 'Global South' refers to all who have a grievance with 'The West' and the 'world order' which they believe to be rigged to keep the 'Global South' in perpetual poverty. This is confused, deliberately, with the racialised concept of the 'Global Majority', used by some members of the BRICS countries to denote the majority of (85%) the world's population of indigenous, African, Asian or Latin American descent, supposedly thus different in origins and political outlook to the West.

It is a deeply problematic paradigm entrenching victimhood rather than agency; it overlooks the obvious examples of economic success and development within its ranks and plumbs for the lowest common denominator; and it externalises the causes of failure and excuses the member states from taking a long hard look at their own failings, be they of political repression or of poor economic choices.

This notion of victimhood is typified by statements such as the following one made by South Africa's then International Relations and Cooperation Minister, Naledi Pandor, at a G77 summit in Havana, Cuba:

'The struggle for the soul of the South and for unilateral global dominance has never been more intense and as the South, we must seize this historic moment to ensure we develop the ability to be free agents of a development agenda that will advance our battle against poverty inequality and unemployment. It is vital for us to be aware that our ambition will not be a popular one as control of global innovation grants immense power over us to developed countries, thus it is not in their interest that we succeed'.[32]

This view is laced with victimhood and paranoia, speaking of 'many so-called partners will strive to divert our attention and break our unity'. Who are these global players who do not want South Africa to succeed?

Perhaps the better question to ask is 'whose interests are served by the idea of a 'Global South' struggling for freedom against a tyrannical 'Global North'?

The answer is, of course, those nations who want to rewrite the world order to normalise their autocracies and stigmatise democracy. This is not the only irony. The Global South is attempting its own reformation and reset of international relations at a time when geo-economics is being trumped by geopolitics. The paradox is that ideology has shifted. The past era of globalisation, which has led to more people being lifted from poverty than during any previous period of economic history, was shaped by three intersecting forces of ideology, technology and great power interests. As Pascal Lamy,[33] the former head of the World Trade Organisation, points out, the challenge is not that the South, led by China and India, is uncommitted to contemporary globalization through openness—'They are', he says, 'because it has been and is good for them'. Rather it is the North, led by the United States, which is less convinced by the path of openness and is moving to isolation, he warns, driven by a combination of domestic factors and technological and geopolitical rivalries. Yet since 'less growth', he warned at a meeting in Athens in April 2024, 'is not going to make people more happy', deceleration of globalisation is more likely than its collapse. Yet there are others, in a further irony, including South Africa that seem more interested in compensating the negative effects of global flows on the poor than benefitting from its overall thrust. In so doing, they risk undoing the structure of the very system that has delivered so much prosperity to the post-Cold War world.

There is a simple equation at play; to gain a share of global growth, you need to trade abroad, and to trade abroad, you need to be willing to accept imports. Protectionism threatens access to richer markets. Any legal, political or other frictions that raise the

cost should be resisted, especially by those who need to ramp up their rates of domestic growth. While there is every justification for the BRICS, as the centrepiece of the Global South, 'to criticize the global order' says Lamy, 'so far they never came with a Plan B'. As a consequence, he says that the BRICS 'are a geopolitical system much more than a geo-economical system, as is clear by the list of candidates to join the group'. There is little to share in economic terms between India, Russia, China, South Africa and Brazil.

Turning the nebulous Global South into a forum of shared grievances about the world order is useful; it offers a warm hearth of friendship and dulls the chill of global isolation. And, tragically, free and democratic nations of the Global South are falling for the idea that it is okay to embrace autocrats and malign states than it is to embrace other democracies.

Freedom House, which produces a map of countries that are free, partly free or unfree, put it this way: 'Autocrats persist in flouting laws and norms in part because they do not believe democracies are serious about upholding them', it reads. 'Economic prosperity and a more secure global community require a global order based on the rule of law, anticorruption safeguards, and a willingness to abide by international security norms; only democracies can maintain such an order. Democratic leaders who ignore this fact imperil not just global freedom, but also security and economic growth'.[34]

More useful would be the notion of the 'Free South'—countries of the developing world that want to build democratic and open societies with thriving economies.

And they would also require a laser-like focus on growth.

6. Conclusions: More Globalisation, Not Less

The end of the Cold War showcased the relative power exhibited by the West over the East but also to reinsert the moral component in Western foreign policy lost in the Soviet occupation and, later, political and economic control over Eastern and Central Europe.

Both these components of power—military and moral—are at risk today. What can be done?

Extraordinary circumstances demand extraordinary actions. As Harry Hopkins, President Franklin Delano Roosevelt's trusted friend and colleague, put it in a memo to the president, 'Democracy must wage total war against totalitarian war', he wrote. 'It must exceed the Nazi in fury, ruthlessness, and efficiency'.[35]

One reason for the relatively poor development performance of donor aid to Africa since independence is because African elites are willing to take the money and never carry out their part of the bargain in terms of reforms. In part, this is because they routinely have not felt the groundswell of popular discontent at the polls, and aid can in fact buffer these political pressures by removing or distorting the link of accountability between populations and their governments.

To a degree, this reflects both the apathy of populations and the extent to which they can be bought off or divided by rulers, and how African leaders have figured out how to manage democracy (read elections) without losing power and without risk of censure domestically, or worse, from outside. An African version of the 'Beijing Consensus' (or 'Putin Consensus') has emerged, offering elites relatively untrammelled access to economic spoils without the threat of political change. Unlike East Asians, Africans have not organised themselves enough to demand rapid growth sufficient to enable societies to go from rural to urban and peasant to middle class in a generation.

Conditionality on aid, leveraging economic assistance with governance conditions has also been successfully repelled by African leadership as an unwarranted intrusion in the domestic affairs of aid recipients, in the process successfully linking governance reforms to the colonial history, ensuring the West is as much a prisoner of its past as African populations.

Despite its considerable aid effort, no matter the administrations in power in Washington or across Europe, the West has consistently found itself on the back foot in its relations with Africa, both on the continent and in building partnerships in multinational organisations such as the United Nations, losing ground to its strategic rivals in the process. Moreover, the slow improvement of African governance and democracy also suggests that such aid programmes are wrongly premised and executed.

Yet, democratic standards, practices and values could overall be better employed as an advantage and tool for donors. However, to achieve this, there is a need for a long-term strategic focus—a clearer division between the longer-term strategic imperative of democracy and governance, and shorter-term tactical security and commercial impulses.

Unlike the record in East Asia, the clear empirical correlation between standards of democracy and growth performance in Africa suggests that getting the (democratic) politics right makes good development sense. Any foreign engagement that ignores the moral economy and puts profit before people and financial reward before human rights is designed to fail, at least in terms of building a relationship between the recipient governments and their populations.

Sanctions are routinely suggested as a means to discourage human rights transgression, increasingly this century, in the form of a targeted 'smart' variety against individual perpetrators. The problem with this approach is, however, that sanctions are themselves often seen as the goal rather than a tool and do little to encourage better standards of governance as opposed to penalising the worst. Moreover, as the example of East Asia's development success illustrates, the challenge is overall to create regional exemplars of prosperity that other states can emulate and feed off in a positive cycle of development. East Asia's development revolution started with Japan and progressed quickly to the Tigers of Singapore, Taiwan, South Korea and Hong Kong followed later by Thailand, Malaysia, Vietnam and others. Africa has few such continental exemplars, save perhaps Ghana, Botswana, Namibia and, more controversially, Rwanda. Ostensibly rewarding failure from outside rather than reinforcing conditions of success—the difference between Somalia and Somaliland, for example—is an extreme version of this donor habit.

There are advantages to incentivising better performance by African partners. For example, categories of donor assistance could be more explicitly linked to governance and democratic performance while at the same time ensuring those at the 'poorer' end of the scale do not fall off completely.

Put differently, there is need to inculcate an environment where the responsiveness of government to demand-side factors from the population—rather than a supply-side agenda distributed by political parties—will increasingly shape the fortunes of political parties and the success or failure of their interventions. With social media and digital communications, power has shifted to the individual at the expense of traditional political party-based infrastructure. From a donor perspective, this requires investing in the democratic process per se, including civil society, rather than solely political parties. Working smarter to change regimes is a constant theme even further along this spectrum of international action.

Finally, what about the rules of the game?

One view, as pursued by several low- and middle-income countries and typified by the BRICS forum (comprising Brazil, Russia, India, China, South Africa and, from 2024, Saudi Arabia, Iran, Ethiopia, the United Arab Emirates and Egypt), is to reform the UN and in so doing diminish the power of the US and other (especially Western) vetoes and improve, supposedly, the power of others of uncertain democratic lineage in deciding their own fate.

But this is a disingenuous tactic and not simplistic; it makes it seem as if the world outside of the Permanent Five in the Security Council is powerless, which it is not. It also

makes it seem as if the P5, which includes Russia and China, is the stumbling block to UN reform, which it might be, but less so than the pretenders themselves.

It avoids the reality of UN operations. To pass a UN Security Council Resolution, nine affirmative votes are required, and no vetoes. China and Russia will not vote against the A3 (three African members). And the A3 should surely get at least two more supporters from the E10 (elected 10)—countries like Brazil and Vietnam will vote with the Africans. So, the A3 can deny the nine affirmative votes if they work together and lobby the others. Thus, while UNSC reform is undoubtedly desirable, the A3 already has what is in practice an effective veto, including, indeed especially, on African issues.

The problem is different. Africans should start *acting* as though they have the power to block anything and use that for leverage to create positive momentum. They will also have to learn to not continue to use that power to block any Council scrutiny of human rights violations and conflicts in Africa—including in eSwatini or BRICS members such as Ethiopia—but instead develop a positive agenda. A great redeeming feature of democracies, for all their faults, is their ability to criticise everyone, including other democracies. That seldom if ever happens between authoritarians.

Africa already possesses agency, then, but prefers to play the victim card.

It makes sense for Africa to have a voice in UN affairs, if only because historically more than half of all Security Council meetings and nearly three-quarters of its resolutions are concerned with the continent. But this means playing the game according to the rules that one develops. While Africa, or at least the bit represented by South Africa, likes to fight against the current rules-based international order, it is difficult to get the South African government (or anyone else for that matter) to tell you what alternative rules they might like or who is going to pay for these ideals. Moreover, the so-called Ezulwini African consensus on UN reform—the two permanent seats with veto powers for Africa—would effectively ensure that other regions ask for the same, and that reform would thereby never happen since the result would be a Security Council with ten or more veto-wielding members, which would guarantee irrelevance. Be careful what you wish for—but only if reform is in fact the aim.

Meanwhile, nobody apparently stops to think that the relative growth and peace of the 'Global South' over the last thirty years has no precedent. This generation has seen, driven by Asia, the largest upliftment out of poverty in human history. According to the World Bank, today 712 million people (nearly 9% of the world's population) live in extreme poverty; in 1990, the figure was two billion, or 38% of the world population at the time.

But understanding why this transition has not happened in much of Africa has very little to do with the UN or, remarkably, even about Israel for that matter. It is to do with choice, and the fact that Africa does not have too much globalisation but too little in the form of open competition for business and markets.

If the premium of development is on what Olusegun Obasanjo has identified as 'transformational, focused, courageous and determined' leadership,[36] the question is how to encourage it down this path?

Ironically, the answer lies in having local role models of the sort that Singapore provides for others in the region, and just as Japan provided earlier for the Asian Tigers' own reforms.

This aspect is personified just 100 meters down from Raffles' statue along the Singapore River in the bust of Deng Xiansheng, the original name of Deng Xiaoping, considered the father of modern China.

Unveiled by Lee Kuan Yew and Chinese Vice President Xi Jinping in 2010 in celebration of the 20th anniversary of diplomatic relations between Singapore and China, the memorial features the quote by Deng that 'Development is of overriding importance' in laying out

Deng's accomplishments—detailing his early life, political activities, his (only) visit to Singapore in November 1978, and his role in Singapore–China relations.

Deng was the first senior Chinese leader to visit Singapore. His 1978 visit spurred subsequent interactions in various fields between the two countries. The same year he initiated his dual policies of economic reform and openness. Following his famous 'southern tour' in 1992, when he referred to Singapore's good social order and management, many Chinese officials were sent to the island for training, illustrating that even the largest most complex societies could—with a necessary dollop of political direction—adopt lessons from the smallest.

Deng is remembered as one of the great modern statesmen—the architect of China's economic transformation through reform. Despite remaining a staunch communist, his reforms were notable for their pragmatism—of socialism with Chinese characteristics—best captured in his following words: 'It does not matter if it is a yellow cat or a black cat as long as it catches mice'. He was proved right, and with the unleashing of the power of the market to allocate resources, China engineered the greatest economic turnaround in modern times.

Heroes and examples of development are important. While Raffles' legacy remains complex and, in some quarters, controversial, his role reminds of the necessity to take the best out of the past to make progress in the future.

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Notes

1 This essay draws from (Mills, 2023a; Kilcullen & Mills, 2024). The authors are grateful to Ray Hartley for his input into this article.
2 See McLachlan and Atkins (2022).
3 For an example of how migration has affected political voting behaviour in Italy, see (Campo et al., 2024).
4 The contributions on Singapore in this paper are drawn from (Mills, 2024a).
5 See 'UNDP and the Making of Singapore's Public Service: Lessons from Albert Winsemius', *UNDP Global Centre for Public Service Excellence*, Available at: https://issuu.com/undppublicserv/docs/booklet_undp-sg50-winsemius_digital (accessed on 3 January 2025).
6 See (Fukuyama, 1989).
7 At https://bush41library.tamu.edu/archives/public-papers/2656 (accessed on 3 January 2025).
8 See Fukuyama (2001).
9 Dr Mills is grateful to Air Vice Marshal (rtd.) Mike Hart for his inputs in this regard.
10 See https://freedomhouse.org/report/freedom-world/50-Year-Timeline (accessed on 3 January 2025).
11 See https://www.afrobarometer.org/online-data-analysis/ (accessed on 3 January 2025).
12 At https://freedomhouse.org/report/freedom-world/2023/marking-50-years (accessed on 3 January 2025).
13 See Tugendhat (2022).
14 Interview with Drs Mills and Kilcullen, Kyiv, 1 August 2023.
15 See International Crisis Group (2023).
16 See Cordesman and Cormarie (2022).
17 At https://www.prb.org/resources/demographic-challenges-of-the-sahel/ (accessed on 27 December 2024).
18 Zoom Conference. 7 February 2024.

19 This section draws from (Mills, 2021).
20 See https://freedomhouse.org/countries/freedom-world/scores (accessed on 28 December 2024).
21 At https://freedomhouse.org/sites/default/files/2023-03/FIW_World_2023_DigtalPDF.pdf (accessed on 3 January 2025).
22 This chapter is based on several visits by Dr Mills to Somaliland, and meetings in person with presidents Silanyo and Muse, most recently in October 2019 and May 2021, and Zoom call on 19 October 2021.
23 By 2060, one of five of the world's oldest countries will be in East Asia, compared with just one in 25 in 2010, according to the World Bank. See https://www.worldbank.org/en/region/eap/brief/rapid-aging-in-east-asia-and-pacific-will-shrink-workforce-increase-public-spending (accessed on 28 December 2024). In Europe, as the post-Second World War baby boom generation retires, the ratio of over-65-year-olds to the working age population is set to rise dramatically, while the number of under-15s declines by nearly 15% by 2060. The 2015 age dependence rate is 27.5 on average in the EU. The rate is projected to jump to 49.4 in 2050, when there will be only two people of working age for every retiree. See https://www.reuters.com/article/us-europe-demographics-idUSKCN0JF1KA20141201 (accessed on 28 December 2024).
24 See Altenburg (2019).
25 This section draws largely from (Mills, 2023b).
26 At https://data.worldbank.org/indicator/GC.TAX.TOTL.GD.ZS (accessed on 27 December 2024).
27 At https://www.worldbank.org/en/news/press-release/2022/03/21/afw-deep-structural-reforms-guided-by-evidence-are-urgently-needed-to-lift-millions-of-nigerians-out-of-poverty (accessed on 3 January 2025).
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Globalisation of Professional Sport Finance

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Abstract: The objective of the present paper is to put a milestone on the roadmap toward a global economic system of professional sport, at least as regards its financial dimension, i.e., its model of finance, its ownership, and some new trends in global sport finance. Professional sport went through a radical change during the 1990s when switching from gate receipts to TV rights revenues as its major source of finance and from local/domestic to internationalised/globalised sources of revenue. This change was more marked in European soccer (football) before spreading throughout other professional sport disciplines. In fact, the whole distribution of sport financing was restructured as shown in this paper. Starting from this evidence of the first stage of sport finance globalisation, it appears that new transformations have been at work in sport finance more recently. In particular, soccer moved from globalisation of flows (revenues, finance) to asset globalisation in terms of club ownership. At last, this paper discusses the emergence of new trends in global sport finance such as treating professional (soccer) players as financial assets and crypto-assets penetrating the sports business.

Keywords: sports economics; sport financing; club ownership; crypto-assets

1. The Evolving Model of Sport Finance: Increasingly Global

For decades and until the early 1990s, professional sport finance was drawn primarily from the spectator's pocket through gate receipts and match day revenues. Beyond this major pillar, sport clubs' finances were completed with revenues from sponsorships and public subsidies. So the predominant model of sport finance had been coined SSSL, standing for Spectators, Sponsors, Subsidies and Local since nearly all these sources of finance were either local or regional, and at best national, but practically never international or global. The SSSL model prevailed in professional soccer, basketball and eventually rugby—when it turned out to become a professional sport in the 1990s. The share of TV rights revenues was not significant and was even negligible at that time.

Since the 1990s, in the Big Five[1] soccer clubs, the financing structure started transforming into a new model when TV rights revenues became more important than spectator affluence revenues, even though other clubs/leagues remained stuck in the SSSL model. The newly shaped model of sport finance was coined MCMMG, standing for Media–Corporations–Merchandising–Markets–Global with fundraising from a global perspective and not only national sources. The share of gate receipts in clubs' total finance significantly decreased. Professional sport clubs could no longer benefit from public subsidies, except under very restrictive EU conditions. The share of sponsorship was rather stable, between 20% and 30% of the total finance. When accounted for separately, merchandising appeared to be a growing share; at the end of the 1990s, the latter was up to 10% in Milan AC's total budget, and 13% in Tottenham's (Table 1).

Table 1. The transition from the SSSL to MCMMG model in the French *Ligue* 1 (in %).

Season	Spectators	Subsidies	Sponsors	TV Rights	Other *
SSSL model					
1970/71	81	18	1	0	0
. . .					
1985/86	50	21	22	7	0
Transition from SSSL to MCMMG					
1990/91	29	24	26	21	0
1993/94	25	19	25	23	8
1995/96	24	17	22	31	6
1996/97	22	15	26	32	5
1997/98	21	12	20	42	5
1998/99	22	10	20	42	6
MCMMG model					
1999/2000	17	4	16	56	7
. . .					
2008/09	14	2	18	55	11
. . .					
2018/19	11	0	22	47	20

* Merchandising and commercial. Source: Direction Nationale de Comptabilité et de Gestion (French league's inner audit).

In the MCMMG model, TV rights revenues have become the major pillar of professional sport finance, and their growth is fuelled by an increasing number of TV broadcasts in all professional sports, in particular in European soccer (Figure 1). High and growing TV revenues are absolutely needed for the Big Five soccer clubs to finance the recruitment of superstar players and pay their wages and bonuses.

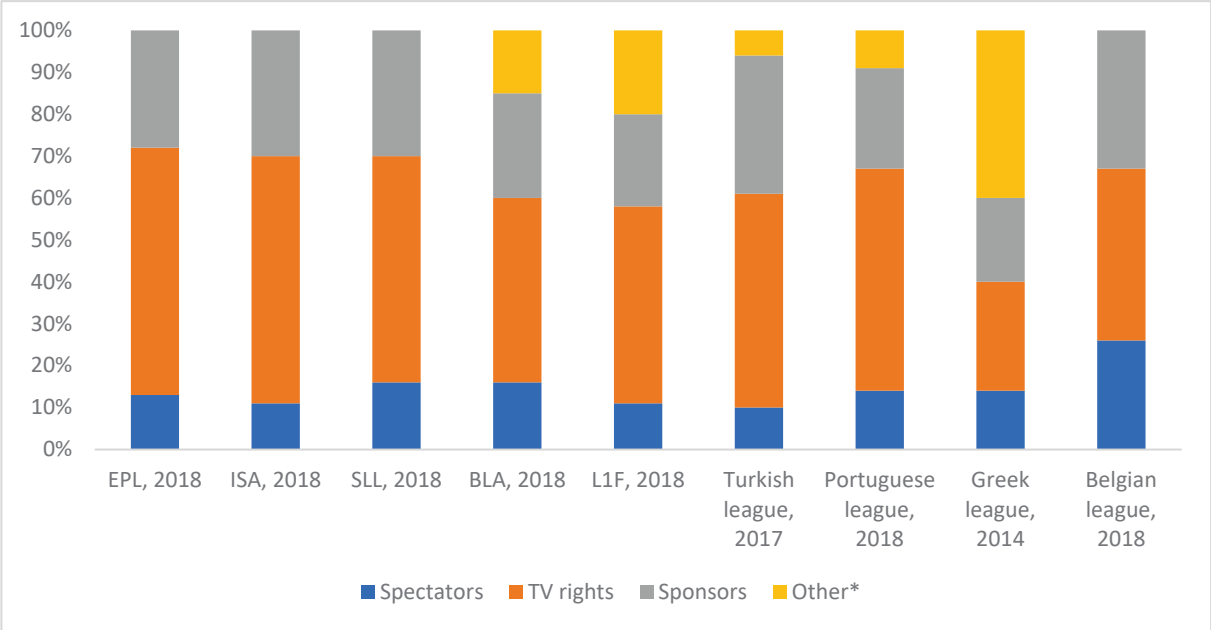


Figure 1. The MCMMG model of sport finance. * Commercial, merchandising. Source: National Leagues.

With MCMMG, another significant source of funds emerged, which was corporate finance during the 1990s. A series of tycoons and patrons invested in the professional sports business. Then, a second group of investors external to the sports industry entered the business, like Roman Abramovich purchasing Chelsea in 2003 and Malcolm Glazer acquiring Manchester United in 2005. With this second wave, foreign direct investment in professional sports, first of all in European soccer, became more and more fashionable

and attracted foreign investment funds, Eastern European (Russian) oligarchs, rich emirs whose fortune was based on oil and gas extraction, American tycoons and Chinese rich people. On top of this, those clubs that benefitted from the windfall finance brought in by new rich owners were used to hiring new professional club managers skilled in recruiting superstar players and finding various ways to cover clubs' financial deficits.

A number of clubs developed a new financing strategy, resorting to two markets, i.e., the market for sporting talent and the capital market. Both markets are globalised, the first one due to the Bosman case (1995), which liberalised labour mobility in the players' market. In European soccer, several Belgian, Dutch and even French clubs specialised in scouting, educating and training young talents in view of selling them to the richest European clubs. Such is the basic strategy for obtaining finance in most Central–Eastern European soccer clubs. The difference between the player's price when they are sold in the market and their training cost, lower than the market price, is the resulting club finance. Some other clubs addressed the capital market with initial public offerings (IPOs) of their shares, though it was a disappointing experience. Many clubs, being recurrently in the red, were delisted in the 2000s and, eventually, Dow Jones closed DJ StoXX Football in March 2022, the market in which their shares were quoted.

One can conclude that the MCMMG model of sport finance no longer relies on a tight relationship between the club's nationality and the citizenship of its players, managers, sponsors, broadcasters and even owners. Big soccer clubs are emerging as transnational corporations, all the more so that they take part in international (European) sport contests from which they draw international finance when they qualify for European-level competitions. In the beginning, such a financing model enabled professional sports clubs to recruit superstar players and the subsequent wage inflation, though in the long run, it paved the way for the financial crisis. UEFA financial data exhibit that, in 2014, out of 55 national top-tier soccer leagues, 10 had adopted a fully-fledged MCMMG model, while 25 were still stuck in the SSSL model and 10 were in transition between the two models (Table 2).

Table 2. Models of finance in UEFA national top-tier leagues, 2014.

MCMMG Model	In Transition	SSSL Model	SSSL Model
England, EPL	Belgium	Armenia	Israel
Italy, ISA	Netherlands	Austria	Latvia
Spain, SLL	Scotland	Azerbaijan	Lichtenstein
Germany, BLA	Norway	Belarus	Luxembourg
France, L1F	Poland	Bosnia Herzegovina	North Macedonia
Portugal	North Ireland	Bulgaria	Malta
Turkey	Hungary	Croatia	Russia
Denmark	Cyprus	Czech Republic	Serbia
Greece	Moldova	Estonia	Slovakia
Romania	Albania	Faroe Islands	Slovenia
		Finland	Sweden
		Ireland	Switzerland
		Iceland	

Source: based on UEFA data.

However, the MCMMG model generates specific issues of its own: the economic and sporting domination of a handful of clubs (an international oligopoly), financial interference in sports decisions, and an invading flow of advertising messages before, during and after a match, mainly for a broadcasting purpose. Such mobilisation of capital inflows, apparently a kind of financial easing, has instead triggered a financial crisis in European soccer.[2]

In most industries, firms attempt to increase their market competitiveness by cutting wage costs, but in professional sports clubs, it is quite the contrary: in view of building up a winning team on the pitch, clubs are used to recruiting as much sporting talent as possible, therefore augmenting their payroll at a skyrocketing pace. Consequently, the last crucial variable of the MCMMG model is a heavy expenditure on payroll plus related social contributions that must be financed (Figure 2). Except in the BLA, the ratio of payroll to

total revenue is higher than 60% in European soccer. In the ISA, a 70% ratio is often reached (up to 90% in 2001), as well as in the L1F since 2017. In addition to payroll, high transfer fees must be paid to acquire superstar players, which increase the burden on professional clubs' finances.

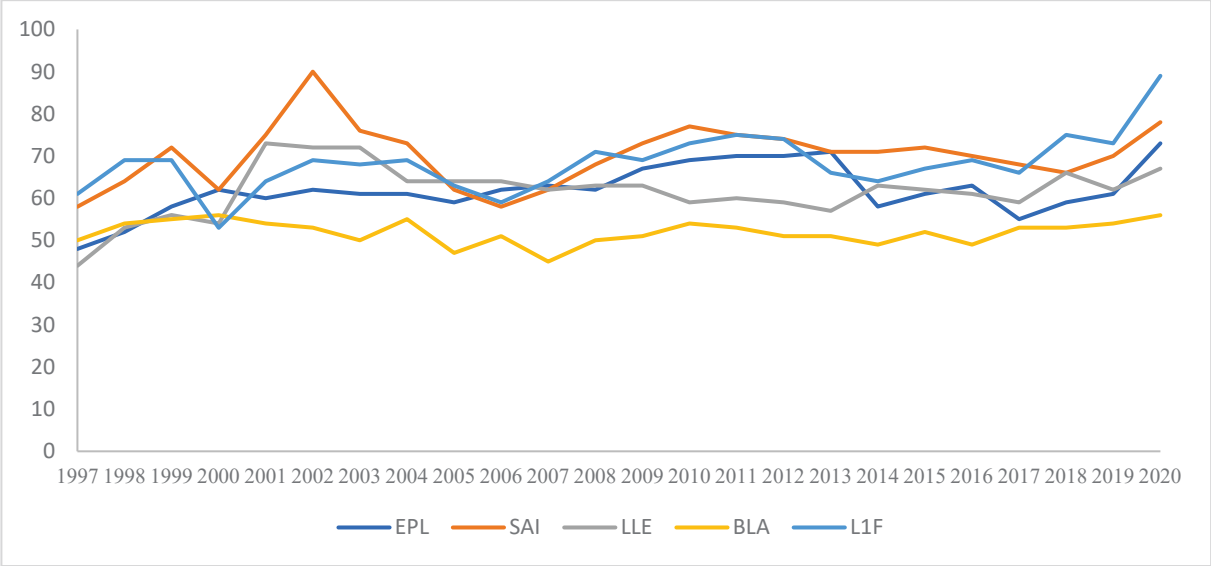


Figure 2. Payroll-to-revenue ratio in MCMMG. Source: leagues (SAI = ISA; LLE = SLL).

As a consequence, by the end of the 2000s, each sporting season, less than 450 out of 700 UEFA top-tier soccer clubs were in the black. The UEFA was extremely concerned with the 35% of clubs (220 to 260 per year) that were recurrently in the red, and in 2012, they introduced the financial fair play (FFP), a kind of financial audit applied to soccer clubs' accounts. Beyond a number of controversies involving big clubs sanctioned because they were breaching the FFP rules (like Manchester City, Paris Saint-Germain and others), they transformed a EUR 636 million cumulative deficit of UEFA top-tier clubs in 2008—which peaked at EUR 1.7 billion in 2011—into a EUR 579 million profit in 2017. The ratio of net debt to total revenue improved in most UEFA leagues over the same period of time. One can register such financial results as better club financial management in the MCMMG model due to auditing, but this is not to say that the roots of the financial crisis embedded in this model have definitely been cut. The FPF regulations were revised in April 2022, and in some respects, are less tight than before: though no payment arrear over 90 days would be tolerated, an upward deviation of EUR 60 million would be accepted if compensated by an injection of external finance into the club, and the overall cost-to-revenue ratio would be required to be below or equal to 70% starting from 2025/26. The new rules are to be enforced during the 2023/24 seasons and the following two seasons. However, payment arrears are a lasting phenomenon in too many professional sports clubs worldwide, namely tax arrears and unpaid bills on transferred players, the latter being more and more often international debts.

2. Globalisation of Soccer Clubs' Ownership

A new dimension of professional sport globalisation took shape that pertained to club ownership. In 2021, 17 out of 20 EPL clubs had a share held by at least one foreign investor as well as 12 L1F clubs (Table 3). In the EPL, the foreign investors were from 10 different countries, and in the L1F, they were from 11 foreign countries. In terms of ownership, the English Premier League is less and less English and more and more globalised; the same conclusion applies to the French league. All foreign owners are billionaires or, at least, hundred times millionaires. Rather often, these rich people have bailed out a club in the red (then they are coined 'sugar daddies'), poured a lot of money into the club (assessed to be

GBP 5 billion invested by Abramovich in Chelsea), stripped out (sold) the less promising assets and, sometimes, sacked a few managers. This is business as usual for private equity investment funds and hedge funds (Drut 2024), which represent, after the sugar daddies, a second set of foreign investors in soccer.

Table 3. Clubs' foreign owners: English Premier League and Ligue 1, 2021.

Club	Owner	Business	Country	Capital Share
English Premier League				
Arsenal	Stanley Kroenke	Real estate	USA	100%
Aston Villa	Nassef Sawins, Wesley Edens	Investment fund	Egypt, USA	100%
Burnley	ALK Capital	Investment consortium	USA	84%
Chelsea	Roman Abramovich	Oil industry	Russia	100%
Crystal Palace	Joshua Harris, David Blitzer	Global management group	USA	36%
Everton	Farhad Moshiri, Bill Kenwright	Steel and power industry	Iran, UK	92.2%/1.8%
Leeds United	Andrea Radrizzani, 49rs, York family	Sport media and NFL	Italy, USA	56%/44%
Leicester City	Srivaddhanaprabha family	Power international group	Thailand	100%
Liverpool	John Henry	Sports goods industry	USA	100%
Manchester City	sheikh Mansour, China Media Capital	Oil industry, government	Saudi, China	78%/12%
	and Silver Lake Partners	Investment fund	USA	10%
Manchester United	Glazer family	Investment fund	USA	100%
Newcastle United	Sovereign fund	Public investment fund	Saudi Arabia	80%
Southampton	Gao Jisheng, Katerina Liebher	Real estate	China, Switzer.	80%/20%
Watford	Gina Pozzo	Businesswoman	Italy	100%
West Ham United	Daniel Kretinsky, Albert Smith	Investment fund	Czech R., USA	27%/8%
Wolverhampton Wanderers	Guo Guangchang	Fosun international	China	100%
Ligue 1				
Angers	Said Chabane	Business enterprise	France/Algeria	93%
Bordeaux (Girondins)	Gérard Lopez	Business enterprise	Spain/Luxemb.	100%
Clermont Foot 63	Ahmet Schaefer	Business enterprise	Switzerland	100%
Lille OSC	Callisto Sporting (Merlyn Partners)	Investment fund	Luxembourg	100%
Lyon (OL)	IDG Capital	Investment fund	China	20%
Marseille (OM)	Frank McCourt	Business enterprise	USA	100%
Metz	Derui	Business enterprise	China	5%
Monaco	Ekaterina Ribolovleva	Personal wealth	Russia	66.7%
Nantes	Waldemar Kita	Business enterprise	Poland	100%
Nice	Jim Ratcliff (Ineos)	Business enterprise	U.K.	80%
Paris Saint Germain	Qatar Investment Authority	Sovereign fund	Qatar	100%
Troyes (ESTAC)	City Football Group	Investment fund	U.A.E.	100%

Source: excerpt from Arrondel and Duhautois (2022).

Most cases of foreign investment in club assets have occurred in the past ten years or so. Thus, the model of professional sport finance has gone much further than the features of MCMMG as regards the last M (now including the financial market). Such a trend is partly correlated with the growing number of billionaires in the world, from 476 in 2003 up to 2640 in 2023, according to *Forbes*, in particular in China, Russia, Saudi Arabia, Qatar, and the U.A.E. (and the US and Switzerland as usual).

Another evolution has triggered a post-MCMMG globalisation of the soccer industry, which is multi-club ownership (MCO). The UEFA distinguishes MCO—when an entity controls or has a "decisive influence" on more than one soccer club—from multi-club investment, which refers to an entity that holds a majority or minority of shares in more than one soccer club. MCO is also defined as a contractual arrangement in which a single investor—an individual or a legal entity—holds shares in two (or more) clubs.

MCO had emerged by end of the 1990s. The ENIC (English National Investment Company), a financial group that was the majority shareowner of Tottenham Hotspur,

started acquiring a majority share in a Greek club (AEK Athens) and a Czech club (Slavia Prague), and a minority share in Glasgow Rangers, FC Basel and Vicenza Calcio. The French TV channel fully owned two soccer clubs, Paris Saint Germain and Servette de Genève, while Robert Louis Dreyfus was simultaneously the owner of Olympique de Marseille and Standard de Liège. However, the actual launch of MCO appeared with the Pozzo family (the owner of the Udinese soccer club) who bought Granada (Spanish third-tier team) in 2009, then Watford (English second-tier team) in 2012. In the early 2010s, a Belgian billionaire, Roland Duchatelet, started owning Saint Trond and Standard de Liège (Belgium), Charlton (England), Alcorcon (Spain), Carl-Zeiss-Iena (Germany) and Ujpest Dosza (Hungary). Club transnational MCO was born, materialising how the soccer industry had become integrated into the new stage of financial market globalisation in capitalism.

Since then, the number of MCOs in soccer has skyrocketed. The UEFA listed 40 soccer clubs involved in MCOs in 2012. They grew in number as follows: 83 in 2016, 98 in 2017, 127 in 2018, 160 in 2019, 181 in 2020, 217 in 2021, 242 in 2022 and 282 in 2023 (Arrondel and Duhautois 2024). The most representative are the so-called 'galaxies' built up by Red Bull and City Football Club (CFG). The Red Bull galaxy encompasses Red Bull Salzburg (Austria) and the MLS franchise New York Red Bulls since 2005, Red Bull Brazil since 2007, Red Bull Leipzig since 2009, and FC Liefering (Austrian second-tier team) since 2012.

Manchester City is the property of sheik Mansour (Abu Dhabi), whose holding CFG also owns the following soccer clubs: New York City, Melbourne City, Yokohama Marinos (Japan) and Club Atletico Torque (Uruguay). Moreover, CFG took over a 44.3% share in Gerona (Spanish *Liga*) in 2017; then, the holding bought Sichuan Jinniu (Chinese third-tier team) and acquired a majority share in Mumbai City FC in 2019. The most recent CFG acquisitions were Lommel SH and Troyes (ESTAC) in 2020, Palermo FC in 2022, and EC Bahia (Brazil) in 2023. This example exhibits how MCO can be utilised as a tool for a dynamic expansion strategy in the global soccer industry.

From a business standpoint, MCO is absolutely legal and widespread in North American professional sports leagues, for instance, in the MLB, where several teams were the property of the same media (Winfree 2005). The issue is quite different in an open league system such as the one of European soccer.

During the 1997/98 season, Vicenza, AEK and Slavia (all owned by the ENIC) qualified for the quarter-finals of the UEFA Cup: out of eight quarter-finalists, three belonged to the same owner. This situation raised the issue of potential manipulation of the sport contest and that club owners might utilise MCO to circumvent sporting rules in deciding, in the case of a match between two clubs they own, which one will win (Breuer and Kaiser 2017). Therefore, MCO triggers potential or actual conflicts of interest and may be the most powerful determinant of sporting outcomes and, consequently, of the owners' profits. In view of protecting the integrity of their domestic sport contests, two-thirds of UEFA national members (federations) impose legal restrictions on MCO between their affiliated clubs. Consequently, MCOs have spread transnationally, between clubs from different domestic leagues.

After the Vicenza–AEK–Slavia case, the UEFA adopted a new rule stating that when two (or more) clubs have the same owner, only one of these clubs is allowed to participate in the same UEFA sport contest. The best-ranked club in the UEFA club ranking is compulsorily chosen by the owner to participate in the UEFA competition. The jurisprudence became the following: any 50.1% (or more) share in the assets of another club is considered as breaching the UEFA rule when the two clubs are qualified for the same European soccer contest.

Nevertheless, some multi-club owners did not stick to the UEFA rule. In 2017, Salzburg, Austria's soccer champion, and Leipzig, ranked second in the BLA, both qualified to play in the UEFA Champions League. In spite of the previous judgement against the ENIC, the Court of Arbitration for Sport did not sentence the MCO here. This case likely paved the way for a new jurisprudence. In 2019, these two same Austrian and German clubs played each other in the Europa League. For the 2023/24 season, the UEFA has allowed Toulouse

FC to play the Europa League even though it has the same owner as better-ranked Milan AC; the same exception applies to Aston Villa and Vitoria Guimaraes, and Brighton and Union Saint-Gilloise. Under the pressure of powerful multi-club owners, the UEFA started a reflection in 2023 on the pros and cons of maintaining its forbidding rule in the face of investment funds and sugar daddies willing to buy a portfolio made up of shares from different clubs. Ownership globalisation is still on the cards.

What are the MCO objectives, except circumventing the sporting rules (Breuer 2018)? As with all mergers and acquisitions, MCOs aim at extending the owner's share in the global market and conquering new markets abroad. Other objectives are to utilise some of the controlled clubs as nurseries for young talents who will later be transferred to other clubs within the same 'galaxy'; fuel the trading market of players' transfers; benefit from economies of scale, saving some costs in managing a network of clubs; adopt a portfolio diversification strategy to alleviate the effect of sporting outcome uncertainty on clubs' operational results; increase the global media exposure of the owner's brand (Red Bull); and, in some cases, strengthen the soft power of a nation state such as Qatar (with Paris Saint Germain) or the U.A.E. or Saudi Arabia (Arrondel and Duhautois 2024).

3. New Trends in Global Sport Finance

The last M of MCMMG is changing for some more reasons.

1/ Players are increasingly considered and treated as assets by club owners. First, in clubs that do not own tangible assets such as a stadium, a training centre and so on, the major part of assets comprises players' contracts. Less than 20% of European professional soccer clubs own their stadium and one-third of them are owners of their training centres. For the great majority of clubs, 61% according to UEFA, a high percentage of their assets consist of intangible assets, i.e., the non-amortised value of their players' contracts. The latter is often completed with some goodwill derived from fan loyalty, the club image, and sponsorship (Stewart 2015). Since a number of players are foreign, clubs' capital is globalised.

Now, the globalisation of players considered to be financial assets is the root of one aspect of the dark side of sport: fictitious (and fraudulent) players' transfers and bungs.

2/ Next, the professional sports industry is in the process of digitalisation and, as such, it is targeted by operators in crypto-assets in North America and Europe as studied in depth by Llorca (2024). Crypto-assets penetrate the sports business by different means: sponsorship contracts between digital platforms that trade crypto and sports organisations or sport superstars (in soccer, NBA and Formula 1); launching fungible and non-fungible tokens (NFTs); and players' wages and bonuses paid in crypto.

In Formula 1 in 2022, 80% of teams had a sponsor belonging to the crypto system. Red Bull has signed the biggest sponsorship contract in crypto in the whole F1 history (USD 150 million) with Bybit, a cyber-currency company. This platform has partnerships with Paris Saint Germain, Philadelphia 76ers (NBA), Canadiens de Montréal (NHL), Italian soccer (Serie A) and the FIA (Fédération Internationale Automobile). Crypto platforms utilise global sport for marketing and promotion as has been witnessed in the EPL (Arsenal, Tottenham, Leicester, Newcastle, Southampton and Watford) and the Italian Serie A (Inter Milan, AS Roma, Juventus, Milan AC and Lazio Roma). The Super Bowl 2022 attracted six crypto-currency platforms as sponsors. Sport offers a global window through which to publicise and advertise crypto platforms.

Some soccer clubs innovated in launching their own fan tokens to facilitate fan participation and loyalty; these are utility tokens built up on a block-chain. Such digital assets are associated with benefits: additional services, providing advice to the club, online voting, sharing some club's minor decisions and the choice of the club's symbols (T-shirt design, music in the stadium, etc.). Juventus Turin and Paris Saint Germain (PSG) have been pioneering this innovation since 2018. In 2020, PSG launched its own crypto PSG Fan Token. A fan token has some similarity to a club's share: it is introduced through a Fan Token Offering (which looks like an IPO) on a trade platform, and the club issues a limited

number of coins during a short period of time at a fixed price on a primary market with an exclusivity benefit for the club's fans. Afterwards, the token is quoted and its price is trade-determined by the demand and supply of this token, which explains its price volatility. A fan selling their tokens receives actual money (euros, dollars); this is why such tokens are termed fungible.

Non-fungible tokens (NFTs) are pure digital entities (referring to a picture, a video, or an audio file), but they are unique. They are a kind of certificate (identified by a number) of a property right. NFTs are virtual goods that no one can materialise by physically holding it. They may pertain to collection cards (ex: Panini), T-shirts and flags produced in a limited number, creating a scarcity that gives each item a significant value. An NFT is also a financial asset since its value usually increases over time. NFTs have developed in the NBA with the NBA Top Shot specialised in the league's high-intensity images, for example, dunks. Sportsmen and women and sports clubs can issue their own NFT.

Athletes and players have become increasingly eager to be paid their wages in crypto. The pioneer was Spencer Dinwiddie, a Brooklyn Nets (NBA) player, who asked that a part of his USD 34 million contract would be converted into crypto in 2019. Other North American players have followed. The franchise pays the player in dollars and a platform converts their wage into bitcoin. In the EPL so far, some performance bonuses have been paid in bitcoin or in tokens. When Lionel Messi moved from Barcelona to PSG, a part of his transfer premium was paid in fan tokens.

At the end of the day, crypto-assets are becoming a new source of revenue and finance with a minimal investment cost while they open new opportunities for marketing, notoriety, fan loyalty and engagement (Schlimm and Breuer 2023).

However, the crypto business is not without its own risks. Crypto-assets have been critically assessed because this financial activity escapes any centralised regulation (Lalucq 2023); they are plagued with frauds, money laundering, economic crime, and conflicts of interest when athletes or players hold fan tokens while they are forbidden to bet on their sporting outcomes. Crypto-bets facilitate match-fixing related to fraudulent online betting. The risk of a crypto financial crash materialised in 2022/23 during a so-called 'crypto winter' following a number of crypto crashes. These include the fall of the stablecoin Terra USD (and its Terra crypto) and a series of bankruptcies affecting the 3 A C hedge fund (which had invested in crypto), Celsius (lender of crypto) and, more importantly, FTX, the second world crypto platform, which went bankrupt in November 2022 after its USD 3.7 billion cumulative deficits from 2018 to 2021. FTX had significantly invested in the professional sports industry. A systemic risk appeared to be plausible in the crypto ecosystem (Slama 2023). In 2023, a number of crypto platforms cancelled their sponsorship contracts with sports clubs and F1 teams (Llorca 2024). The value of NFTs dramatically dropped in 2023, with only 1% of all NFTs keeping a value higher than USD 6000. Now, the financial perspectives of crypto-assets in sports seem to be blurred.

4. Conclusions

Both soccer club globalisation of ownership and the new trends in global sport finance call for a new economic analysis that must go beyond the MCMMG model. A new model of finance is on the brink of emerging, but its fully fledged shape is not yet definitely formed, encompassing foreign direct investment in club property, multi-club ownership, trading players as assets and using sporting crypto-assets.

No doubt, European clubs' revenues have escalated over the past few decades and may still grow over the coming decades, namely if the regulations (such as the DNCG and FPF) are going to loosen more than tighten. This raises the important issue of club and league governance, a topic that the author has covered in some of his previous publications. All these trends in sport finance globalisation open new avenues for further empirical and theoretical research in sports economics and finance, which will develop and enrich its present state of current knowledge.

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Notes

1 The European Big Five soccer leagues are English Premier League (EPL), Spanish *La Liga* (SLL), German *Bundesliga* (BLA), Italian Serie A (ISA) and French *Ligue* 1 (L1F).

2 See the Special Issue 'The financial crisis in European football' of the *Journal of Sports Economics*, 7(1), 2006.

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Review

The Sovereign Wealth Fund Paradox: Evolution, Challenges, and Unresolved Issues

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Abstract

Sovereign wealth funds enhance the international movement of capital and often facilitate economic development in domestic and host countries. However, the lack of transparency and accountability of SWFs varies, and state ownership gives rise to suspicions and realizations of political motivations, unfair commercial advantages, opportunities for corruption, and national security threats, thereby challenging the liberal economic order. This paper provides an overview and identifies major concerns and policy options associated with SWFs. Defining SWFs, measuring their size and transparency, domestic, cultural, and political origins, and policies for oversight and mitigation of geopolitical risk are discussed. The goals and behavior of SWFs are too diverse to draw broad, general conclusions. The growth in the number of funds and assets under management has increased their diversity, but the essential defining characteristic is that they are state-owned financial investment vehicles not subject to the hard budget constraints or regulations of comparable private sector, market-oriented entities. Transparency varies, with democratic country SWFs more transparent and less problematic than those of autocracies. SWFs have evolved into unbounded state-owned entities ushering in a new era of financial statecraft. Policies to guide their behavior and enforcement mechanisms are host-country specific and highly variable. An often-discussed international regulatory framework to mitigate geopolitical risk has not emerged and is not likely.

Keywords: sovereign wealth funds; transparency; accountability; national security; geopolitical risk

JEL Classification: F33; G20; O53; P33

1. Introduction

Sovereign Wealth Funds (SWFs) have evolved from obscure financial entities to major players in global capital markets, managing over an estimated USD 14 trillion in assets in 2025.[1] Their growing influence, coupled with persistent issues regarding transparency, governance, and geopolitical and international security risks, demands the attention of policy makers, economists, and security analysts. The survey and analysis below examine the history, structural diversity, and unresolved challenges in governance and international relations.

2. The Evolution and Systemic Importance of SWFs: From Kuwait to Global Systemic Players

The modern concept of a SWF originated in 1953 with the opening of the Kuwait Investment Office in London, eight years before Kuwait's independence. This evolved

into the Kuwait Investment Authority, generally considered the first SWF,[2] which now manages a portfolio of equities, fixed income, and alternative assets estimated at over a trillion USD.[3] Early on, SWFs operated with little notice, but the 21st century has seen an explosive growth, from 20 funds managing about USD 500 billion in 2000 to now with the top 50 managing over USD 14 trillion. This growth has transformed SWFs into systemic economic actors capable of influencing asset prices, corporate governance, and international political dynamics. The financial crisis in 2008–2009 marked a turning point for SWFs as they injected an estimated USD 90 billion into distressed Western financial institutions, providing critical liquidity and expanding their role as stabilization funds beyond their domestic borders.[4] While selectively beneficial, these actions also raised concerns about the motives of state-backed investors, particularly those from non-democratic regimes. Then, again during the COVID-19 pandemic, SWFs provided financing for domestic stimulus programs, becoming a critical fiscal policy tool for their host country.

Their purpose and activities are now wide ranging, if not unlimited, and for many there is limited available description, analysis, or evaluation of their activities and performance because of the lack of transparency. Several are recognized as very transparent and well managed (e.g., the Norway Government Pension Fund—General (NGPF) and the New Zealand Superannuation Fund (NZSF), inter alia), and others are severely opaque (e.g., Russian Direct Investment Fund, China's SAFE Investment Company, United Arab Emirates Dubai World, inter alia). In addition, moving parallel with the development of SWFs are Sovereign Investment Funds (SIFs), which focus primarily on domestic development objectives.[5]

After a basic discussion of the definition and characteristics of SWFs below in Section 2, and an overview of the scope and magnitude of assets under management in Section 3, specific issues and challenges are addressed in the sections that follow. The academic literature discussed in those sections is drawn from several distinct areas of research. First, the financial economics perspective emphasizes the SWF role as a source of patient capital contributing to improved overall portfolio diversification. However, this literature suffers from sample selection bias as, by necessity, the focus tends to be on the most transparent funds, like NNGPF or the NZSF, inter alia, which publish detailed investment reports and adhere to or exceed the Santiago Principles, following their own country-specific corporate governance and financial reporting standards.[6] In contrast, opaque funds, e.g., like those mentioned above (or in Table 1b or Table 1c discussed below) also by necessity, are generally ignored in most financial analyses. Most funds fall in the middle of the transparency spectrum (like those in Table 1b discussed below), and this creates wide gaps in the understanding of risk–return profiles across the range of SWFs.[7] Most of the finance literature focuses on traditional finance issues, like the impact of SWF investments on individual company share prices or returns,[8] but the studies rely on very specific samples of SWF and are usually not generalizable to SWFs as a group. In meta-reviews of the literature, e.g., Bahoo et al. (2020) or Mami (2023), analytical results and conclusions are typically described as mixed.[9]

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Table 1. (**a**) Most Transparent Sovereign Wealth Funds: This table provides fundamental information on the most transparent SWFs (TTS greater or equal to the Top 50 median of 65). Estimates of assets undermanagement by SWFI, Global SWF, and the SWF itself, when available. In addition, for transparency the Tuman SWF Scoreboard (TTI), the Linaburg–Maduell Transparency Index (LMTI) and the GSR are reported. Country characteristics, the Democracy Index, and the Autocracy Score are reported. Details are provided in the notes to this table. (**b**) Least Transparent Sovereign Wealth Funds: This table provides fundamental information on the least transparent SWFs (TTS less than Top 50 median of 65). Estimates of assets undermanagement by SWFI, Global SWF, and the SWF itself, when available. In addition, for transparency the Tuman SWF Scoreboard (TTI), the Linaburg–Maduell Transparency Index (LMTI), and the GSR are reported. Country characteristics, the Democracy Index, and the Autocracy Score are reported. Details are provided in the notes to the Table below. (**c**) Sovereign Wealth Funds Not Scored by Truman: This table provides fundamental information on SWFs for which there was insufficient information to calculate Truman SWF Scoreboard score. Estimates of assets under management by SWFI, Global SWF and the SWF itself, when available are reported. In addition, if information is available the Linaburg–Maduell Transparency Index (LMTI) and the GSR are reported. If information is available for country characteristics, the Democracy Index and the Autocracy Score are reported. Details are provided in the below.

(**a**)

Rank (Assets Under Management)	Sovereign Wealth Fund	Country	Estimated or Reported Assets (USD Billion)			Transparency Indices			Country Characteristics	
			SWFI (2025) [1]	Global SWF (2025) [2]	SWF Itself Circa (2023–2024) [3]	Truman SWF Scoreboard, 0–100 (2019) [4]	Linaburg–Maduell Transparency Index, 0–10 (2024) [5]	GSR, 0–25 (2024) [6]	Democracy Index 0–10 (2024) [7]	Autocracy Score, 0–10 (2018) [8]
1	Norway Government Pension Fund Global	Norway	1739	1743	1739	100	10	24	9.81	0
2	China Investment Corporation	China	1332	1332	1330	74	7	20	2.11	7
4	Abu Dhabi Investment Authority	UAE	1058	1110	NA	65	6	14	3.07	8
5	Kuwait Investment Authority	Kuwait	1029	969	NA	70	6	10	2.78	7
10	Hong Kong Monetary Authority Investment Portfolio	Hong Kong (China)	514	526	NA	70	8	22	5.09	NA
13	Mubadala Investment Company	UAE	302	330	302	75	10	23	3.07	8
14	Temasek Holdings	Singapore	288	288	291	79	10	25	6.18	4
15	Turkey Wealth Fund	Turkey	279	190	320	68	6	19	4.26	4
16	Abu Dhabi Developmental Holding Company	UAE	225	225	NA	65	5	18	3.07	8
17	Korea Investment Corporation	South Korea	189	207	189	85	8	23	7.75	0
19	Future Fund	Australia	150	204	180	87	10	22	8.85	0
25	State Oil Fund of Azerbaijan	Azerbaijan	60	60	49.03	92	10	7	2.8	7
28	New Zealand Superannuation Fund	New Zealand	48	46	43.14	94	10	25	9.61	0
39	Azerbaijan Investment Holding	Azerbaijan	22	37	NA	92	NA	7	2.8	7
43	Timor-Leste Petroleum Fund	Timor-Leste	17	19	18.91	91	9	12	7.03	1

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Table 1. *Cont.*

(b)

Rank (Assets Under Management)	Sovereign Wealth Fund	Country	Estimated or Reported Assets (USD Billion)			Transparency Indices			Country Characteristics	
			SWFI (2025) [1]	Global SWF (2025) [2]	SWF Itself Circa (2023–2024) [3]	Truman SWF Scoreboard, 0–100 (2019) [4]	Linaburg–Maduell Transparency Index, 0–10 (2024) [5]	GSR, 0–25 (2024) [6]	Democracy Index 0–10 (2024) [7]	Autocracy Score 0–10 (2018) [8]
45	Ireland Strategic Investment Fund	Ireland	16	19	15.09	85	8	25	9.19	0
	Median Value (n = 16)		252	216	189	82	8	21	5	4
6	Public Investment Fund	Saudi Arabia	925	925	765	39	6	24	2.08	10
7	GIC Private Limited	Singapore	801	847	NA	64	7	16	6.18	4
9	Qatar Investment Authority	Qatar	526	524	NA	46	5	18	3.17	10
12	Investment Corporation of Dubai	UAE	341	380	NA	64	5	14	3.07	8
18	National Development Fund of Iran	Iran	157	162	132	56	4	13	1.96	7
20	National Welfare Fund	Russia	133	NA	NA	51	NA	NA	2.03	5
21	Emirates Investment Authority	UAE	91	102	NA	36	3	7	3.07	8
22	Samruk-Kazyna	Kazakhstan	81	79	81.17	64	10	18	3.08	6
24	Brunei Investment Agency	Brunei	73	65	NA	30	1	2	NA	NA
30	Libyan Investment Authority	Libya	40	68	68.4	23	4	13	2.31	NA
36	Russian Direct Investment Fund	Russia	25	28	NA	37	7	4	2.03	5
41	Mumtalakat Holding	Bahrain	18	18	16.8	55	10	12	2.47	10
44	Revenue Regulation Fund	Algeria	16	NA	NA	26	1	NA	3.55	1
	Median Value (n = 13)		91	102	81.17	46	5	13	2.77	7

(c)

Rank (Assets Under Management)	Sovereign Wealth Fund	Country	Estimated or Reported Assets (USD Billion)			Transparency Indices			Country Characteristics	
			SWFI (2025) [1]	Global SWF (2025) [2]	SWF Itself Circa (2023–2024) [3]	Truman SWF Scoreboard, 0–100 (2019) [4]	Linaburg–Maduell Transparency Index, 0–10 (2024) [5]	GSR, 0–25 (2024) [6]	Democracy Index 0–10 (2024) [7]	Autocracy Score 0–10 (2018) [8]
3	SAFE Investment Company	China	1090	1358	NA	NA	2	4	2.11	7
8	Badan Pengelola Investasi Daya Anagata Nusantara	Indonesia	600	NA	NA	NA	NA	NA	6.44	0
11	National Council for Social Security Fund	China	414	424	NA	NA	5	8	2.11	7
23	Dubai Investment Fund	UAE	80	80	NA	NA	NA	18	3.07	8
26	Kazakhstan National Fund	Kazakhstan	56	65	55.7	NA	2	4	3.08	6
27	Oman Investment Authority	Oman	50	50	50	NA	4	14	3.05	8
29	Ethiopian Investment Holdings	Ethiopia	45	46	NA	NA	5	8	3.24	2
31	Khazanah Nasional	Malaysia	36	32	30.68	NA	6	18	7.11	7

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Table 1. *Cont.*

(c)										
Rank (Assets Under Management)	**Sovereign Wealth Fund**	**Country**	**Estimated or Reported Assets (USD Billion)**			**Transparency Indices**			**Country Characteristics**	
			SWFI (2025) [1]	**Global SWF (2025) [2]**	**SWF Itself Circa (2023–2024) [3]**	**Truman SWF Scoreboard, 0–100 (2019) [4]**	**Linaburg–Maduell Transparency Index, 0–10 (2024) [5]**	**GSR, 0–25 (2024) [6]**	**Democracy Index 0–10 (2024) [7]**	**Autocracy Score 0–10 (2018) [8]**
32	National Wealth Fund, UK	UK	36	36	34.75	NA	NA	NA	8.34	0
33	CNIC Corporation Limited	Hong Kong (China)	33	NA	NA	NA	NA	NA	5.09	NA
34	Hong Kong Future Fund	Hong Kong (China)	28	NA	NA	NA	NA	NA	5.09	NA
35	Beijing State-Owned Assets Management Co., Ltd.	China	28	NA	NA	NA	NA	NA	2.11	7
37	Nuclear Waste Disposal Fund	Germany	23	26	24.91	NA	NA	24	8.73	0
38	Fund for Reconstruction and Development of Uzbekistan	Uzbekistan	23	NA	23.61	NA	NA	4	2.1	9
40	Polish Development Fund	Poland	20	20	NA	NA	NA	16	7.4	10
42	Malta Government Investments	Malta	17	2	NA	NA	NA	3	7.93	NA
46	Sociedad Estatal de Participaciones Industriales	Spain	15	NA	17.23	NA	NA	NA	8.13	0
47	The Sovereign Fund of Egypt	Egypt	12	2	NA	NA	4	11	2.79	4
48	Sharjah Asset Management Holding LLC	UAE	10	3	NA	NA	NA	6	3.07	8
49	Future Ireland Fund	Ireland	9	NA	NA	NA	NA	NA	9.19	0
50	Maharlika Investment Fund	Philippines	9	NA	NA	NA	NA	NA	6.63	0
	Median Value (n = 21)		28	36	33		4	8	5	7

Note: Only national level funds are included, NA means not available. [1,2,3] Total asset values for SWFs are obtained from the Sovereign Wealth Fund Institute, Global Sovereign Wealth Fund (GSWF), as well as from SWFs' annual reports and official websites. Data reported are the latest available and the year is noted. SWF rank is based on assets under management as reported by the Sovereign Wealth Fund Institute (SWFI). [4] The Truman SWF Scoreboard is provided by the Peterson Institute for International Economics. It ranges from 0 to 100. The Truman SWF Scoreboard is from 2019, the last date available. [5] The Linaburg–Maduell Transparency Index is from SWFI. It ranges from 0 to 10 and the last date available is 2024. [6] The Governance, Sustainability, and Resilience (GSR) Index is from the Global Sovereign Wealth Fund (GSWF). It ranges from 0 to 15 and the last date available is 2024. [7] The Democracy Index is from the Economist Intelligence Unit. It ranges from 0 to 10 (most democratic) and 2024 is reported here. [8] The Autocracy Score is from the Center for Systemic Peace and ranges from 0 to 10 (most autocratic). Data and scores used from SWFI and GSWF were retrieved from their websites on 22 March 2025.

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Importantly, SWFs face a complex principal agent problem as even the identified principal varies across SWFs. Cuervo-Cazurra et al. (2023) examine the principal agent problem in detail. In their analysis, the principal may be future generations, the current population, or simply the "rulers" as the embodiment of the nation. The goals will then differ, and the agents may achieve them with highly variable levels of success. Braunstein (2017) links agency to structure in his case study of Singapore and Hong Kong. His introduction offers a brief review of international political economy and organizational sociology theory and argues that the heterogeneity of SWFs is attributable to domestic cultural and politics. Megginson and Fotak (2015) emphasize the diversity of SWFs must be taken into account. Cuervo-Cazurra et al. (2022) provide a review and framework for the analysis of SWFs vis-a-vis other state owned multinational firms.

A second stream of the literature focuses on corporate governance and transparency and reveals stark disparities in transparency of activities, investment strategies, and internal controls. This line of research was pioneered by Truman (2007) at the Peterson Institute and this discussion remains contentious with many issues unresolved.[10] Similarly, Linaburg and Maduell developed an alternative measure of transparency. Both are indirectly related to analyses of SWF compliance with the Santiago Principles, a voluntary set of "generally accepted principles and practices" for measuring the effectiveness of governance and oversight of SWFs. Much of the research in this area is in the realm of accounting and law, or "soft law." These indices and related issues are discussed in detail in Section 4 below.

A third stream of the literature in sociology and political economy emphasizes that while the behavior of individual SWFs is driven by the state and performance of the domestic economy, which is deeply rooted in the domestic cultural, political, and social structure, and momentary competitive political dynamics. The state of domestic affairs then influences or directs SWF international activities. These, in turn, create persistent geopolitical concerns unresolvable in the current global environment. These issues are discussed in Section 5.

Finally, another stream of the literature focuses on these geopolitical and security concerns arguing that SWFs serve as instruments of "financial statecraft". This literature elevates governance issues to the state level, focusing heavily on the lack of transparency and underlying political objectives of the funds.[11] Regardless of legal structure, the funds are state entities that de facto and de jure pursue the objectives of the state without the hard economic constraints of profitability or efficiency of a typical private entity in a market economy, e.g., the China Investment Corporation (CIC) has invested strategically along with other Chinese firms, in ports, energy infrastructure, and tech firms aligned with Beijing's Belt and Road Initiative.[12] These issues are discussed further in Section 6.

Intertwined in these streams of research are discussions of actual performance of SWFs and recipient-country policy responses discussed in Section 7. Section 8 provides a summary and conclusion. There, I conclude that despite years of international discussions, the fundamental issues remain unresolved, and broad conclusions are difficult to make because of the heterogeneity of sovereign wealth funds in and of themselves. Many SWFs are clearly state actors, and their analysis demands not only traditional financial and economic analysis, but a broader socio-political approach found in the literature on international affairs and international state craft. The explicit role of the state will frame or dominate market forces. An acceptable international regulatory organization is not likely to evolve, and individual countries are and will continue to be forced to cope individually. Or, at best, regional organizations like the OECD may provide general guidelines with wide latitude for individual country actions.

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3. Sovereign Funds—A Taxonomy of Objectives and Evolutionary Challenges

"Sovereign Wealth Funds (SWFs) are pools of assets owned and managed directly or indirectly by governments to achieve national objectives."[13] Typically, they have been funded by commodity revenues, e.g., royalties on the sale of natural resources, foreign exchange reserves, or fiscal surpluses. The IMF (2008) identified five types of funds based on their main objective: (1) *stabilization funds*, designed to insulate the national budget and domestic economy from commodity price swings, usually oil, (2) *savings funds,* designed to realize and convert natural resource wealth into more diversified assets for future generations and mitigate the effects of Dutch disease, (3) *reserve investment corporations*, designed to increase the return on foreign reserve assets (which otherwise are typically invested in very short term assets to be available for currency exchange rate management purposes), (4) *development funds*, designed to finance domestic infrastructure and industrial policies and support socio-economic projects or overall development objectives, and (5) *pension reserve funds*, which pre-fund national pension systems (from sources independent of individual contributions) or provide for unspecified contingent liabilities.[14] The wide ranging purposes of SWFs are important as the purpose leads to differing objectives, governance, asset allocations, and performance measures.[15] This taxonomy serves as a strong starting point and remains most influential, but is challenged by increasingly strained institutional innovation and the blurring of functional lines among these categories. In its purist sense, it fails to capture hybrid entities like Singapore's Temasek Holdings, which combines development objectives with commercial return targets.[16] Often, a SWF's purpose has been expanded, depending on the needs of the state. As mentioned, during the financial crisis and COVID, these funds have been a significant source of liquidity utilized to stabilize the economy, recapitalize a wide range of domestic and foreign firms, or recapitalize the entire banking and financial systems.[17] In these cases, SWFs were seen as a coping mechanism, outside of their original design, to ameliorate real economic crises.

Strategic investment funds (SIFs) or companies may be included in discussions of sovereign wealth funds although they differ considerably in their source of funding, primarily direct government appropriations, and their goals are much narrower than most SWFs.[18] They focus on national strategic economic objectives, e.g., supporting critical industries, supply chains, or technologies. In addition, infrastructure to support innovation and sectors vital to national security are often major areas of investment. SIFs present a whole range of additional issues as agents of the state with strategic, economic, and political objectives.[19] In any case, there is still a wide-ranging discussion about which entities should be considered SWFs or not.[20] In reality, they simply now fall into a broad general category of highly diverse state-owned investment entities.

4. The Magnitude of SWFs: Assets Under Management

It is very difficult to construct comparative data for SWFs. Reporting is voluntary, there are no uniform, obligatory reporting standards,[21] and different analysts have compiled data at different points in time, for different measures of assets and in different currencies (or in USD at different exchange rates). Global SWF provides comprehensive running totals of estimates of assets of SWFs, broadly defined, pension funds and central banks but full access is proprietary. Other authors, e.g., Truman (2007, 2008a, 2008b, 2010, inter alia) and the Peterson Institute of International Economics also provide estimates along with the Truman Transparency Score (TTS). Many other authors do as well, at particular points in time with differing methodologies, but importantly, for the least transparent SWFs the estimates vary by significant amounts.

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Regardless of the origin of their revenues or their specific purpose, SWFs have become large enough to be systemically important. The growth in assets under management and general activities of SWFs largely tracks the overall global economy, especially commodity prices. While estimates of total assets at particular points in time have merit, longer-term growth projections have proved to be very incorrect. While the general trend has been and is now positive, both the global financial crisis and COVID-19 broadened the range of activities of SWFs, their investments, returns, and disbursements. The response to these global crises provide examples of how the large pool of assets and the agility of SWF management may play a critical stabilizing role, both internationally and domestically. López (2023) provides an overview of the response of SWFs to these crises noting that during the financial crisis SWFs injected USD 71.2 billion into major financial institutions and during COVID-19 disbursed USD 211.3 billion, primarily in their own domestic economies. In many cases, these actions were significant enough to affect total assets under management.

The Appendix A Table A1 provides data on the top 50 SWFs including estimates of assets under management (AuM), transparency indices, and country characteristics.[22] Estimates of assets under management by the SWF Institute, Global SWF, and the amounts reported by the individual SWF itself, when available, are reported in the first three data columns. The top five SWFs manage over a trillion USD each, while the smallest of the top 50 manage less than USD 10 billion. In total the top 50 funds manage just over USD 14 trillion. Early on, Kimmitt (2008) provided some perspective by noting relative to other types of participants in the financial markets, SWF assets are small compared to total global assets under management by all financial institutions. Today, the largest SWFs individually are in the same league as large US hedge funds.[23] The number of individual hedge funds and pension funds is much larger than the number of SWFs but the concentration of assets in a handful of SWFs is much greater. Although possible, it is not likely, because of regulatory oversight, that any one hedge fund or pension fund would substantially and permanently move a market. It is clear though that politically motivated SWFs could be significant players—able to move markets—in selected smaller equity and debt markets.

Also noted in Table 1 are the Truman Transparency Score (TTS), the Linaburg–Maduell Transparency Index (LMTI) and the Governance and Sustainability Score (GSR), discussed further below. The varying transparency scores provide a significant warning that the estimates of assets under management must be interpreted with caution since some of the largest SWFs are also not transparent. Over time, the Norwegian fund has been recognized as a model for SWFs, both in transparency and in general management. From Table 1, we see it remains the largest, at about USD 1.667 trillion, and has a Truman Transparency score of 100 out of 100 possible. The next two largest funds, China Investment Corporation (CIC), has assets over a trillion US dollars and a score of 74, but China's State Administration of Foreign Exchange (SAFE IC) with estimated assets over a trillion USD is not scored by Truman but scores 2 out of 10 on the Linaburg–Maduell index.

5. Measuring Transparency and Governance and the Failure of the IFSWF Santiago Principles

5.1. Measures of Transparency

Truman (2007) discussed the need for greater transparency and accountability of SWFs very early on. The Asian financial crisis provided further motivation for focusing on transparency and accountability, which was cited by the Group of 22 working group on the financial crisis report as a complicating factor in managing the financial crisis. There are several on-going efforts to evaluate or "score" SWFs. The earliest, most notable, and

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best documented measure of overall SWF behavior is that developed by Edwin Truman, then at the Peterson Institute. (Hereafter, the Truman Transparency Score, TTS).[24] These transparency scores have been continuously refined and updated since then, and additional SWFs have been added to the sample. Parallel to Truman's efforts, a second long-standing comprehensive measure of transparency is the Linaburg–Maduell transparency index (LMTI), now under the auspices of the SWF Institute. Also of interest, Lopez (2020) calculates a Governance, Sustainability and Resilience (GSR) score card which covers public pensions and SWFs. It also has a transparency and accountability component.[25] The TTS, the LMTI, and the GSR are reported in the table in the Appendix A for the top 50 SWFs.

Based on the latest TTS, the SWFs are regrouped as more transparent, less transparent, and those not evaluated and presented in Table 1a–c. The TTS, LMTI, and GSR measures, while they often do not agree, are correlated (discussed below) and clearly illustrate the highly diverse nature of the management of SWFs. The details of the Truman Score are further revealing.

The overall score that Truman calculates is based upon 33 individual criteria grouped into indicators evaluating the structure (including fiscal treatment), governance, transparency, accountability (which includes investment strategy implementation, investment activities, reporting, audits), and behavior.[26] The maximum score is 100. Table 1 of Maire et al. (2021) provides the latest scoring (2019) for 64 sovereign wealth funds.[27] From their analysis, Norway's Government Pension Fund—Global scores 100 and Equatorial Guinea's Fund for Future Generations scores an 11, the lowest of those scored. Twelve of the eighteen funds with scores above eighty are OECD countries. Most of the SWFs with scores above 80 are from developed economies such as Norway, the US, New Zealand, Canada, France, Ireland, Netherlands, Japan, and Australia. However, the TTSs of Azerbaijan, Korea, Nigeria, Palestine, Timor-Leste, and Trinidad and Tobago are also included in that range. In their analysis the lowest SWF scores, 30 or less, include SWFs from Brunei, Algeria, UAE, Libya, and Equatorial Guinea. It is difficult to compare SWF scores, especially for those in the middle of the range, since the scores for the individual components vary widely, and their relative importance varies. Nonetheless, the scoring provides a basis for discussions of specific problematic issues and concerns, and some general conclusions emerge.

To emphasize the range and differences in transparency, the Appendix A Table A1 for the top 50 SWFs is disaggregated by transparency. Table 1a below provides the SWFs with greater than or equal to the median TTS, Table 1b presents those with below-median scores and Table 1c those SWFs not scored. We see that the most transparent SWFs, Table 1a, include the largest, the top four (Norway GPFG, China Investment Corporation, Abu Dhabi Investment Authority, and Kuwait Investment Authority) each with over a trillion USD in AuM and others that are very small (Azerbaijan, Timor-Leste, and Ireland) with less than USD 25 billion in AuM. The median value of AuM for this group is USD 252 billion. The less transparent SWFs, below the median TTS, in Table 1b, also exhibit a similar pattern, with very large funds, the Public Investment Fund of Saudi Arabia and GIC Private Limited of Singapore each with over USD 800 billion AuM, as well as smaller SWFs like the Russian Direct Investment Fund, Mumtalakat Holding of Bahrain, and the Revenue Regulation Fund of Algeria with less than USD 25 billion under management. The median value of AuM is USD 91 billion, significantly less than the median for the top 50 as a whole, and the most transparent funds as well. The AuM for SWFs not ranked at all (for TTS) follow the same pattern, with some very large funds, like SAFE Investment Company of China over USD 1 trillion AuM, and Badan Pengola Investasi Daya Angata Nursantra, of Indonesia with USD 600 billion along with many smaller funds like the Fund for Reconstruction and Development of Uzbekistan with USD 23 billion AuM.

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From Table 2 below, while the ranges of scores in each grouping are large, regional patterns are clear: (1) SWFs from OECD countries average score is much higher than non-OECD countries; (2) of the non-OECD SWFs Latin American SWFs score next highest, (3) of non-OECD SWFs, Middle East, both Gulf Coast Countries (GCC), and non-GCC SWFs score low on average, in the mid-50s, (4) Africa and Russia score lowest overall. The non-Middle East SWFs, excluding Africa and Russia, score higher than the Middle East SWFs.[28] Separately, from Maire et al. (2021) it is seen that pension funds score higher on average than non-pension funds and IFSWF members average scores (for those reporting) are not different than non-members.

Table 2. Selected average Truman SWF 2019 scores.

Region or Group	Average Score	Range
Africa	52	83–11
Asia	66	92–30
Middle East, Gulf Cooperation Council (GCC)	54	75–24
Middle East, Non-GCC	55	85–23
OECD	80	100–48
Latin America, non-OECD	70	82–48
Other	57	57
Russia	44	51–31

Note: Average scores are only for countries reported in Maire et al. (2021) and some countries have multiple funds. OECD: Australia, Canada, Chile, France, Ireland, Italy, Korea, Mexico, New Zealand, Norway, Spain, Turkey, and the United States; Asia: Azerbaijan, Brunei, China, India, Hong Kong, Kazakhstan, Kiribati, Malaysia, Nauru, Timor-Leste, and Singapore; Non-OECD Latin America: Panama, Peru, and Trinidad and Tobago; Africa: Algeria, Angola, Botswana, Ghana, Equatorial Guinea, Morocco, Nigeria, Rwanda, and Senegal; GCC: Bahrain, Kuwait, Qatar, Saudi Arabia, and the United Arab Emirates; Non-GCC Middle Eastern: Iran, Libya, and Palestine; Other: Cyprus; Russia.

While our discussions are based on the Truman Score, it is important to note that the TTS and the Linaburg–Maduell index measures are correlated and provide roughly the same information. Table 3a indicates that they are correlated at 0.67 for the top 50 SWFs (listed in the Appendix A) but Table 3b indicates an even higher correlation, at 0.81, for those that are most transparent (those in Table 1a). The correlation is less, 0.4, in Table 3c, for SWFs deemed less transparent (those in Table 1b). From Table 3a–c we see that the TTS and LMTI are also correlated with the GSR but at lower levels. The correlation between TTS and the GSR is slightly higher than that for LMTI and GSR. The correlation between the TTS and LMTI for the most transparent SWFs is reassuring, but the lower correlation for the less transparent SWFs is a clear signal that transparency matters, and very different conclusions may be reached about SWFs even among highly respected evaluators.

These differences are accentuated when we compare the transparency measures with other country characteristics. Wang and Li (2016) links these variations to domestic legal and country governance structures.[29] Democracies with robust oversight mechanisms tend to have more transparent SWFs, while authoritarian regimes often treat fund operations as state secrets. Cuervo-Cazurra et al. (2023) found positive correlation between democracy (based on the polity score of democracy measure constructed by the Centre for Systemic Peace) and transparency and the LMTI. They find authoritarian countries tend to have less transparent SWFs. In the sample of the largest 50 SWFs (Appendix A Table A1) and Table 1a–c, we include the Democracy Index from the Economist Intelligence Unit and the Autocracy Score from the Center for Systemic Peace.

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Table 3. (a) Correlation of Transparency Measures and Country Characteristics, Top 50 Sovereign Wealth Funds (Corresponding to Table A1 of the Appendix A). (b) Correlation of Transparency Measures and Country Characteristics, Most Transparent Sovereign Wealth Funds (Corresponding to Table 1a). (c) Correlation Analysis of Transparency Measures and Country Characteristics, Least Transparent Sovereign Wealth Funds (Corresponding to Table 1b).

(**a**)

	Truman SWF Scoreboard	**Linaburg–Maduell Transparency Index**	**GSR**	**Democracy Index**	**Autocracy Score**
Truman SWF Scoreboard	1				
Linaburg–Maduell Transparency Index	0.67	1			
GSR	0.45	0.37	1		
Democracy Index	0.73	0.5	0.57	1	
Autocracy Score	−0.72	−0.48	−0.41	−0.91	1

(**b**)

	Truman SWF Scoreboard	**Linaburg–Maduell Transparency Index**	**GSR**	**Democracy Index**	**Autocracy Score**
Truman SWF Scoreboard	1				
Linaburg–Maduell Transparency Index	0.81	1			
GSR	0.78 [1]	0.31	1		
Democracy Index	0.74	0.53	0.6	1	
Autocracy Score	−0.73	−0.48	−0.51	−0.96	1

(**c**)

	Truman SWF Scoreboard	**Linaburg–Maduell Transparency Index**	**GSR**	**Democracy Index**	**Autocracy Score**
Truman SWF Scoreboard	1				
Linaburg–Maduell Transparency Index	0.4	1			
GSR	0.3	0.16	1		
Democracy Index	0.48	0.08	0.15	1	
Autocracy Score	−0.31	−0.13	0.36	−0.5	1

Note: [1] Excluding the scores for the Kuwait Investment Authority, the State Oil Fund of Azerbaijan, and the Timor-Leste Petroleum Fund for which the discrepancy between the IIS and GSRs is quite large. Including them, the correlation is 0.2.

For our sample of the 50 largest SWFs Table 3a–c present the correlations between the TTS and the LMTI with country characteristics, the GSR, the Democracy Index, and the Autocracy Score for the full sample and the two subsamples (high and low transparency SWFs as defined in Table 1b,c). We see from Table 3a that the TTS is correlated with the GSR, Democracy Score, and Autocracy score at 0.45, 0.73, and −0.72, respectively, for the full sample. The LMTI is correlated with these measures as well but at lower levels: 0.37, 0.5, and −0.48, respectively. For the most transparent SWFs, Table 3b, the TTS and LMTI correlations with the country characteristics are about the same as the full sample; and again, the LMTI correlations with country characteristics are lower than those for the TTI. For the less transparent subsample of SWFs, the correlations for both the TTS and the LMTI with country characteristics is much lower. For the TTS, the correlations are 0.3, 0.48, and −0.31 for the GSR, the Democracy Index, and the Autocracy Index, respectively. For the LMTI, the correlations are even lower at 0.16, 0.08, and −0.13, respectively. While macro-level measures of country characteristics are not sufficient to explain transparency, the TTS is generally more highly correlated with desirable country characteristics, even more so for the most transparent SWFs. Overall, we also observe that the less democratic,

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more authoritarian countries have lower median TTS and LMTI. The results affirm and accentuate Wang and Li's (2016) and Cuervo-Cazurra et al.'s (2023) findings that democratic countries have more robust regulatory oversight and have more transparent SWFs.

5.2. The Santiago Principles

Many of the transparency issues found in Truman's scoreboard have been discussed by individual countries and international organizations (the OECD and IMF in particular) for years, and individual attitudes toward SWFs are varied (See Černohorský & Tesnerová, 2020). Due to the wide divergence of interests and contentious nature of the issues, such as the tension between market liberalism vis-a-vis state-directed actions and nationalism in the SWF home country and the conflict between foreign investment policies and national security issues in recipient countries, a formal treaty, law, or organization for oversight of SWF governance and accountability has not emerged. Instead, a voluntary set of best practices, the Santiago Principles,[30] emerged from the earliest discussions of the IMF Working Group (IWG) on Sovereign Wealth Funds.[31] There are 24 specific principles (some disaggregated further) to which the international working group agreed and which address many of the issues raised regarding the management of sovereign wealth funds. Also, from the discussions, a new membership-owned organization, the International Forum for Sovereign Wealth Funds (IFSWF), emerged. While the original group created these guidelines, they are voluntary, as is membership.[32] The IFSWF is designed "to promote understanding of SWFs" and "encourage appropriate disclosure" of activities in line with the Santiago Principles. The Principles are voluntary, or "encouraged," and there is no means of external monitoring for compliance, evaluation, or enforcement. Nonetheless, Truman (2010, Appendix 6A) compares them point by point with his scoreboard criteria, noting extensive overlap, which suggests that Truman's scorecard is close to a measurable benchmark for the Santiago Principles and is applied to members and non-members alike. It is obvious that the degree of compliance varies widely. Behrendt (2010) also assesses a set of major SWF's compliance with the Santiago Principles and emphasizes the inexplicable variation in compliance. Rose (2013), in an extensive review of corporate governance issues, concludes that SWFs underinvest in governance, and the lack of transparency is detrimental to their own long-term goals. Both SWF home countries and recipient countries should provide encouragement for stronger governance.

The Santiago Principles, while useful, are not considered sufficient to address the issues raised above and are not without critics, especially due to their voluntary nature. Transparency and better governance is essential for both host- and recipient-country governments. But recipient-country governments are still left to address concerns of anti-competitiveness, market disruptions, political influence, and national security issues on their own. "Because sovereign wealth funds are owned by and ultimately controlled by governments, it is naïve to believe that they can or should be treated as apolitical. The standards applied to sovereign wealth funds should be higher than those applied to private sector institutions precisely because they are governmental institutions that are not subject to the discipline of the market and ultimately are accountable to the citizens of their countries." (Truman, 2008a).

According to Gordon (2010), the OECD guidance for recipient-country policies toward SWFs that evolved from these discussions reaffirms long-standing OECD investment principles (e.g., openness, nondiscrimination, and transparency) and provides guidance on how national security concerns should be handled and not be seen as a veiled form of protectionism. Follow-up on discussions suggested peer monitoring (e.g., the IFSWF practices, which are mostly ineffective) and closer examination of whether foreign state

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immunity leaves gaps in legal accountability. Basically, the OECD Guidelines provide a framework for continuing discussions and country-level actions.

Lee (2009) is less subtle, calling the Santiago Principles a 'thin' financial rule of law, noting they and the OECD Declaration on SWFs cannot even be labeled "soft law" because they were issued by specific interest groups of states. The language, terms like 'principles' and 'practices,' suggest informality and flexibility, not 'code' or 'regulations' which suggest hard rules or law. They form a 'soft and unenforceable framework' for the 'facilitation of the understanding and implementation of the principles,' absent a central regulator or enforcer. Frynas (2017) also notes the low level of compliance and general ineffectiveness of the Principles as a means of assuring transparency. Haberly (2011) to paraphrase, describes the Santiago Principles as a reflection of the prevailing neoliberal ideological preferences, and only that. They are not necessarily in the interest of the state, the SWF, or firms involved. They form only a broad framework and process for recipient and home country to reach a common understanding and practice.

On the other hand, some question even the need for regulations aimed at SWFs, in particular. Kratsas and Truby (2015) provide a broad overview and discussion of regulatory options. They also provide a rationale for a self-regulatory body of peers, like the IFSWF and the Santiago Principles (GAPP) (see pp. 36–40) as an alternative to country-by-country regulations or a new international regulatory body. While generally supporting this option, they conclude, however, that the IFSWF and members have not fulfilled that role. In 2010, the compliance ratio for the principles ranged from about 15% for Libya to over 95% for New Zealand, for those countries that reported.[33] Since membership is voluntary and reporting is voluntary, there is no effective external regulatory check on the activities of SWFs. Again, the heterogeneity of SWFs is notable. What incentive do the governments of major SWFs have to subject themselves to additional international law? Individual governments must respond in their own interest as international discussions have yielded only voluntary, and, therefore, marginally effective, guidelines.

Overall, serious issues regarding SWF performance and intentions are widely recognized. The Santiago Principals themselves are dated, and the lack of compliance yields them ineffective. In fact, twenty noted scholars issued a "Call for Action" via Global SWF (2023) for a re-examination of the Principles and suggested third-party monitoring. Still, there is no obvious enforcement mechanism and little political support for such. In fact, Cohen (2009, p. 726) calls most ideas for reform, like the formation of a hypothetical international organization, a "World Investment Organization" like the World Trade Organization, a mirage. Individual country incentives do not align. He suggests simply international agreement on definitions, risk assessment methods, and dispute resolution would be a major accomplishment.

6. Domestic Origins of SWFs: Cultural, Political Determinants, and Socio-Economic Costs and Concerns

The first generation of SWFs discussed in Section 1 were created primarily to manage extraordinary revenues from commodity-based exports and moderate the negative effects of relative price movements that would disrupt other sectors of the economy. Their purpose has expanded, and the wave of new SWFs post-2000 tend to have broader investment and development objectives, often purely politically motivated. Thus, understanding the motivation of state governments to create SWFs or SIFs is important in evaluating their effectiveness and contributes to a better understanding of the variability in measures of transparency and performance. Bernstein et al. (2013) also emphasized the "mixed legacy" of SWFs as a key in understanding their mission and goals. In smaller developing economies, they were often seen as necessary to compete with the power of large multi-

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national financial institutions, investors, and corporations. In autocratic countries, they represent the expansion of state power both domestically and globally. Aggarwal and Goodell (2018) illustrate the importance of culture in their analysis of the relationship between governance (individual components of the Santiago principles) and individual components of Hofstedt's measures of culture. Braunstein (2017, 2018) emphasizes macroeconomic conditions and policies alone are not sufficient to explain the formation and activities of SWFs. Understanding domestic state–private sector relations and cultural norms is also critical. In his review of Gulf Coast countries, Kuwait, Bahrain, UAE (Abu Dhabi), and Qatar, strong royal families generally controlled the assets and direction of the economy, but, at the time of independence[34], the structure of the private sector in each country differed and led to SWFs with different objectives. Kuwait, UAE, and Qatar had relatively weak domestic financial, construction, and trade sectors, which allowed a greater role of the state and early creation of SWFs, emphasizing management of savings and investment and development. Bahrain, on the other hand, had a relatively well developed, diversified private financial sector, and a smaller role for the state in domestic developmental finance. It was not until 2006 that the government of Bahrain created Mumtalakat to take a more active role in domestic economic development and diversification. Similarly, Singapore and Hong Kong have many common features as small open economies without natural resources, and both created SWFs, but they are very different in goals and behavior due to differences in domestic financial institutions and their interaction with private sector entities, inter alia.[35]

Thus, from a political-economy view, SWFs may take on three roles. They are instruments to assure domestic political stability or survival (a short-term goal of a less stable government); they maximize returns on investment and promote economic development (a long-term view of a stable government); and they are an instrument of foreign economic policy. The domestic political environment is a critical factor determining, tempering, or overriding economic policy objectives. The relative position of these varies by country with SWFs in well-regulated, free market democratic countries with strong institutions focusing on pure economic objectives (e.g., Norway) whereas in autocratic regimes the focus of SWFs may vary. Shih (2009) argues that in a highly unified autocracy, like Singapore, SWF resources are more likely to be directed to long-term economic growth. Whereas in a fragmented regime like China (in the early 2000s), the SWF may be an arena for political and bureaucratic infighting, leading to short-term gains for the leadership. Opportunities for corruption are more likely and, in fact, are not uncommon, as discussed below.

These examples illustrate Petrakis' (2014) general argument that corporate governance is built on the foundations of national legislation and regulation. These, in turn, originate from the cultural norms of society (Petrakis, 2014, Chapter 5, *inter alia*). Poor governance and lack of transparency enable poor policies to be maintained and corruption to flourish. Similarly, Di Bonaventura Altuve (2024) argues, in a comparative analysis of Venezuela and Azerbaijan, that SWFs rarely fail or exhaust their assets because of macroeconomic shocks or crises. Rather, highly institutionalized regimes are more stable, less risky, and can pursue activities consistent with long-term economic development goals. SWFs in weakly institutionalized, less stable regimes are forced into short-term behaviors for political survival which are incompatible with long-term economic development goals and, therefore, are more likely to fail. External monitoring is not a solution. Frynas (2017) emphasizes external monitoring, like the Santiago Principles, is effective only if they are built on the foundation of strong domestic institutions.

While the cultural and socio-political foundations are important and may lead to different policies for development, the notion that SWF/government intervention at scale in the macroeconomy is beneficial is also debatable. Commodity-based SWFs simply convert

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wealth in the form of natural resources in the ground into wealth held in more traditional financial assets. The new, more "spendable" form of wealth may generate increases in spending and GDP, generally a positive outcome. However, the now-realized wealth of the SWF may enable the continuation of undesirable macroeconomic and financial policies to the long-run detriment of the country. Governments must still provide sound macroeconomic policies: fiscal, monetary, and exchange rate management.[36] Market discipline could be lost, and governments could make political decisions with adverse long-run consequences because of the easy financing available if they can tap the SWF resources. The economic benefits may also be lost, if they existed at all. In fact, Aslund (2007) claims "sovereign wealth funds are often a lousy bargain for the countries that have them" and in democracies there is no justification for their existence (See Aslund, 2007).

There is a clear trade-off as the actions of a well-managed SWF with long-run economic development objectives as a goal may prove beneficial in economies with no or underdeveloped capital markets. However, these benefits are not assured. Raymond (2010), in an analysis of SWF interventions to support domestic financial institutions and equities markets during the global financial crisis, finds mixed results, e.g., interventions in 2008 by the Kuwaiti SWF were unsuccessful whereas those by the Qatari fund were successful in supporting the stock market, in the short run. Other examples he considered were medium-term loans to banks, rather than the typical short-term central bank loans. The SWFs effectively became an insurance fund for managing through financial crises.

An additional caveat regarding potential domestic benefits is potential corruption. Some SWFs have been the source of massive corruption schemes and illicit finance. Vittori and Kumar (2024) provide several examples of corruption, money laundering, and illicit financing of arms exports. Brown and Diamond (2024) provides a detailed description of the Malaysian sovereign investment and development fund, 1 MDB's money laundering scheme, labeled the "largest kleptocracy case to date" by the US Justice Department in 2016. They detail the complicated network of participants, including Goldman Sachs, which received USD 280 million in fees for facilitating the early stage of the laundering. Several executives were convicted of violating the US Foreign Corrupt Practices Act for bribery, diversion of funds, and money laundering through a web of shell companies in a USD 4.5 billion scheme to fleece the Malaysian State Investment Fund. Goldman Sachs paid USD 3 billion in fines to the US and over USD 5 billion worldwide. The ex-prime minister received a ten-year prison sentence.[37]

To extend the argument, the existence of SWFs may create and empower a rentier class of political elites independent of the population and with no interest in economic growth or capital market development, per se.[38] The government survives without the need for taxes upon the population to finance its activities and, therefore, has no need to provide accountability of its actions. The sometimes-destabilizing movements of free markets are of no concern as SWF distributions can smooth domestic fluctuations, pacify restless populations, and balance business and political interests to ensure regime survival. Trudelle's (2022) social network analysis of distributions from Saudi Arabia's Public Investment Fund indicates that funds flow to "family-owned conglomerates connected to merchant elites with long standing ties to the Saudi state" assuring support for the ruling elite. Further, given the anti-Western attitudes of some countries' populations, Europe and the US may be less inclined to promote democracy in authoritarian states if the state is friendly and has the financial wherewithal to continue in power.

While macroeconomic policies may be altered by the existence of SWFs, the management of the SWF in and of itself may cause even more serious issues regarding the efficiency with which resources are used, the pattern of economic development, and social and economic disruptions, legal or otherwise. SWFs are very heterogeneous and many

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lack clarity in their organizational structure, have ill-defined governance mechanisms, lack accountability and transparency and suffer from poorly designed or non-existent financial management policies. The lack of independent auditors or published annual reports and, therefore, very opaque balance sheets leaves room for behavior that may be questionable. For these, neither the domestic population nor international partners or foreign governments trust the actions of SWFs.[39] Critics suggest they are a major source, or even the principal source, of graft and corruption in their respective economies. The claims that SWFs lead to an inefficient distribution of financial assets and, therefore, lower rates of growth in GDP or other measures of economic well-being must be taken seriously.[40]

7. Implications and Consequences of the Lack of Transparency and State Ownership: Commercial Advantages, Political Motives, and National Security Issues

Underlying Western economies is free enterprise and the efficiency of markets in allocating goods, services, and factor inputs, including capital. The belief that markets can allocate resources more efficiently than governments is fundamental, and the role of the government is to maintain the legal system, intervening for the public good and developing industrial policies for the long-term public good and national security. By endowing states with the financial power embodied in sovereign wealth funds, these foreign governments become actors in the recipient-country's domestic economy and then have the power to influence markets, distort the competitive allocation of resources from their best market-determined use and provide opportunities for corruption at massive scale. Thus, the most basic assumptions about the functioning of western economies and the international financial system are challenged (See Kimmitt, 2008; Slawotsky, 2009). The inherent dangers of state organizations acting without transparency in the capital market of free market economies relate both to economic activities with potential anticompetitive impact and outright political goals benefiting the SWF home country and threatening or supporting the recipient countries. Investments are not simply the free movement of capital but here are dictated by national goals, not the economic returns that motivate the typical investor. By this reasoning, SWFs are a structural threat to market integrity and potentially the national security of a recipient country. The national security threats have long been recognized (See Thatcher, 2012) and, if anything, are greater now. The new international "balance of financial power" is a serious concern.

There is a wide range of concerns, some even regarding the most well-managed, most transparent sovereign wealth funds. The Norwegian model is often considered the best one, in which the ownership interests of the government are separated from the economic activities of the fund, i.e., "public ownership, but effectively privately operated." Notably it does not invest in domestic assets, only foreign, and on a global scale, with 70% of the portfolio in equities. But early on, Backer (2009, p. 1272) argued ". . . Norway is consciously pursuing state policy indirectly through its funds. Investment is clearly meant to project Norway's political power by other means, and to move policy in particular directions. . .". The Norwegian fund seeks to maximize wealth, but rather than investing in benchmark indices dictated by the efficient markets hypothesis they also, like private funds, look for market aberrations and seek 'excess returns' subject to strong explicit 'ethical guidelines.'[41] As a result, the Norwegian Fund, like private funds, over the years become entangled with Norges Bank Investment Management (2025) movements advocating corporate social responsibility guidelines, sanctions against Israel, and prohibitions against investment in Burma, for example. More recently, they divested from fossil fuels firms and Russian company shares as a result of the Russian invasion of Ukraine. Notably, they were clear and transparent in their actions. *At best* we would expect the funds to be influenced in ways

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similar to ways in which private funds are influenced and act accordingly, i.e., the route of traditional shareholder activism, but the primary shareholder is a government entity. In many ways, this is benign in terms of national security issues, but clearly domestic political considerations come into play. However, at the level of a recipient firm, the lack of transparency of SWFs may have spillover effects on firms that SWFs invest in. While the effects may be unclear, Chen et al. (2025) find that SWF investees may make greater efforts to improve corporate responsibility. However, these issues are trivial in comparison to direct commercial advantages or national security challenges.

7.1. Direct Financial and Commercial Impacts

Concerns reach far beyond traditional public interest group or shareholder activism affecting individual firms. Significant direct commercial advantages for individual companies in a SWF portfolio may also arise. There is the potential for a perceived or actual unfair competitive advantage relative to the private sector. With a sovereign guarantee, explicit or implicit, portfolio firms may be able to obtain financing rates (or bailouts) not available in the private market. Further, access to foreign exchange may be facilitated or may be funneled through domestic enterprises which then invest abroad. Or, perhaps more dramatically, a portfolio company may benefit from business information gained by the intelligence services of the home country. Intelligence "cross-pollination" may benefit the SWF home country.

As the Norwegian Fund, the most transparent example, demonstrates, SWFs could and do employ large pools of capital in non-commercial ways that are politically sensitive, to promote a foreign policy objective, even if not an explicit national security threat. Less transparent autocratic SWFs act in ways more directly aligned with the national interests of their government or even with the assistance of other government agencies. For example, a simple case would be for the SWF to pressure a portfolio company to open a production facility in the home country to create jobs.

Early on, Slawotsky (2009) argued that SWFs will no longer be passive investors, but are becoming more active owners of large "flagship" international companies that will "allow them to influence corporate boards in dramatic ways, radically transforming corporate governance."[42] It is not necessary for a SWF to take active control of a company, but a board seat or outsized voting rights could provide leverage to influence firm activities.[43]. While the potential for takeover of specific firms and potential market disruptions—for the products or resources that these firms produce—are real, the influence of SWFs and their home-country governments may be much more subtle. Just the threat of withdrawal, explicit or implicit, could be sufficient to cause a portfolio firm or the firm's government to alter its behavior. Kamiński (2017) argues that China's SWFs have invested heavily in European energy companies, have gained valuable insights from their board representatives that may be shared with Chinese competitors, and also provides indirect political influence over European energy policies. These concerns become clouded by those who consider any investment by a Chinese firm as an extension of state policies whether it is via a SWF or not. Given the potential advantages for the SWF and home-country government policy gains, is there any beneficial effect for the recipient of SWF investments?

In an early study, Dewenter et al. (2010) examine 47 transactions in which SWFs, mainly the Norwegian and Singapore funds, acquire a significant position in listed firms. They found that there was a significant positive return to announcements of SWF purchases. SWFs were active investors, rather than passive, as others suggested, with more than half of the "firms experiencing one or more events indicative of SWF monitoring or influence."[44] They also provide evidence that the Truman Transparency Score is positively related to post acquisition stock performance.

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Megginson and Fotak (2015) provide a broad survey of SWF issues including the effects of SWF investments on target firms. The general result for five papers reviewed[45] was that excess returns due to the announcement of SWF equity investment was 1–3%. For those papers that also studied long-term returns, they found negative excess returns. Karolyi and Liao (2011) and Bortolotti et al. (2015) also found that the SWF announcement excess returns were less than that found when announcements by similar privately owned institutional or corporate investors were made, i.e., there was a "SWF discount."

On the other hand, in a comparison of private companies' vs. SWFs acquisitions, Wang et al. (2021) finds that adversarial relationships between the SWF home country and the acquisition home country hinders acquisitions, and cooperative relations helps acquisitions. They suggest that geopolitical concerns may actually moderate the SWF activities vis-à-vis those of private firms. But again, this clearly identifies political factors as an underlying motivation of SWF activities.

Added to this threat is the potential for SWF activities to disrupt national capital markets or more readily, the value of an individual stock. Sudden changes in portfolios by a major SWF or a group of aligned SWFs may disrupt the market with consequent real economic effects that may also have political effects, such as changing election outcomes. While during the global financial crisis SWFs also made large investments in distressed financial institutions, stabilizing some of the firms, but taking large reductions in their own portfolio values just as other participants did.[46] Nonetheless, if they take large, opaque positions and markets are illiquid then their actions, or even rumors of their actions, can increase volatility. The evidence is very case-by-case specific and often contradictory. Beck and Fidora (2008) examine major portfolio changes in the Norwegian SWF and find no evidence "for a stock price impact of non-commercially motivated stock sales by the Norwegian Government Pension Fund".[47] However, Drezner (2008) notes the economic turmoil resulting when the Norwegian Government Pension Fund shorted several financial sector stocks in Iceland, which then affected the entire economy. Again, while Rose (2008a, 2008b) and Kimmitt (2008) argue that they are generally passive investors, they are sovereign actors, designed to maximize the interests of their state, and the lack of transparency may readily conceal their motives.[48] To be re-iterated though, SWFs are very diverse. The beneficial actions of some SWFs do not alleviate the caustic actions of others.

7.2. National Security Issues and Political Motives

There are a host of national security issues that also arise. One set of issues involves the transfer of science and technology via corporate board actions. For example, transferring engineering studies and blueprints from a portfolio company to a domestic one as part of a joint venture or production agreement is a much more direct transfer than the reverse engineering required by the purchase of goods and services subject to the Wassenaar Arrangement (successor to COCOM) review as in the past.[49] The SWF pursuing national objectives may take positions in many firms in a critical sector. Haberly (2011) provides an innovative network analysis of the Mubadala Development Company's (one of Abu Duhbai SWFs) strategic investments in the aerospace and semiconductor industries.[50] In the case of semi-conductors, Mubadala saved AMD from bankruptcy by acquiring a 20% stake. Then, the basic foundry level chip making was transferred to GlobalFoundries followed by acquisition of production facilities from IBM and other companies. Research and training relationships with leading organizations were then established. GlobalFoundaries became a global player, the third largest (by revenues) manufacturer of specialty process semiconductors. While Abu Dhabi has acquired sensitive dual-purpose technologies, these have not yet significantly benefited the domestic economy, similarly for aerospace.

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These investments clearly involve international strategic objectives. Even if not overt, Slawotsky (2009) notes that international antagonisms may lie dormant during times of prosperity, but economic stress brings them to the surface, and purposeful actions of SWFs may damage the interests of an antagonist. Examples include the dispute between Russia and Ukraine over natural gas and the sudden reduction in energy supplies to the Czech Republic when the Czechs agreed to host anti-missile radar facilities. While these actions were by Gazprom, a Russian firm,[51] sovereign wealth funds can easily exert similar pressures via the portfolio firms in which they have influence. And, the purchase of a company connected with the Prime Minister of Thailand by Singapore's Temasek was a key trigger of the coup in 2006.[52] China's hostile actions toward Taiwan are similar to those of Russia's.[53]

A third issue concerns the actions of the portfolio (or recipient) country's government. For political reasons, the recipient-country government may take actions that favorably affect the holdings of a foreign SWF and benefit the SWF state.[54] For example, Calluzzo et al. (2017) using campaign finance data in the US find evidence that SWFs are attracted to campaign finance firms and firms in industries that may be vulnerable to legislation inhibiting foreign investment, clearly illuminating potential political motives for SWF actions in the US. Drezner (2008) though, clearly distinguishes between SWFs of democratic governments, which are more transparent and likely to act in a slower, predictable fashion, and those of authoritarian governments, which may act quickly and without recourse of the electorate.

Early on, Cohen (2009) discussed the important economic role SWFs play in global capital markets, noting, however, that the significance of each individual transaction must be evaluated under the umbrella of SWF country political objectives. These micro-level concerns are manifestations of Lenihan's (2014) global view. Simply put, the very existence of a SWF "may be to fulfill a politically motivated purpose as part of a state's larger grand strategy to enhance their economic power relative to another state or set of states" (p. 246). Effectively, a SWF is a sovereign actor and it will seek to maximize or protect the economic power of its state and in the end must be seen as such. As non-military geo-economic competition grows in importance, SWFs provide a vehicle to exercise that power.[55] They "are not only powerful financial actors. . . [but] also offer the state a means through which they can channel economic forces to their advantage" presently and influence "the future balance of power within the international system" (p. 246).[56] Given that most sovereign wealth fund resources are in developing or resource-based economies, the relative position of developed economies is challenged. Haberly (2011) also emphasizes that South–North investments via SWFs are targeted and leveraged to establish and extend global alliances of strategic importance for national economic development, often in cooperation with other state-owned enterprises. An example is the fully state-owned COSCO's acquisition of ports across Europe and the world (See Areddy et al., 2025).

8. Policy Responses to Commercial Advantages and National Security Challenges

There is often a clear conflict between SWF (and their government's) investment policies and target-country national security issues, and, as a result, there have been three general responses on the part of recipients of SWF investments. First, there is a general call by recipient countries for greater transparency of activities, clearly defined and monitored corporate governance, and better measures of the impact of their behavior, at a minimum as if the SWF were a private sector firm (an investment company or mutual fund company).[57] Second is a call for improved regulation and greater scrutiny of SWF activities in the recipient countries, again, at least as if it were a privately held firm. And

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third, there has been a re-examination of existing national security mechanisms bringing greater awareness to potential SWF actions. All assume that the accumulation of assets by sovereign wealth funds is appropriate to begin with, which is debatable in itself, particularly in democratic, developed market economies. Because of differing views policy responses have been different.

8.1. Greater Recipient-Country Regulation and Oversight

The debate is typically framed as SWFs facilitate the free movement of capital vis-à-vis they pose a threat to national security. In general, most observers begin with the positive aspects of facilitating international capital flows and the general positive behavior of SWFs but usually conclude that the lack of transparency for many funds arouses suspicions that are difficult to allay. Many argued during the early period when the IFSWFs was formed, that self-regulation is the best option. Feng (2009), for example, provides an overview of SWF activities and a review and history of US regulations. At that time, he concluded self-regulation would be the best choice, but, of course, that has not happened, and the international legal framework surrounding their actions is not effective, and individual countries have acted independently. Gilson and Milhaupt (2008) also propose a simple corporate governance solution: make shares of a firm acquired by sovereign entities non-voting. Their fear is that additional regulation may lead to investment protectionism and a reduction in the efficiency of global capital markets. Nonetheless, Thatcher (2012) finds the US has generally imposed more restrictive or stronger legislative monitoring of SWFs when compared to policies of the UK and Europe.[58]

Rose (2023a) provides a recent comprehensive overview of regulatory issues for SWFs and SIFs: legitimacy and accountability, corruption and waste, politicization, and the negative political and financial spillovers. While regulatory and legal solutions are discussed, mainly within the context of existing US laws, all depend on the fundamental transparency of the SWF (and SIFs). As expected, the response of each of the many recipient countries has varied, but the US framework on investment policies and national security issues and the OECD guidelines for treatment of SWFs by recipient countries may both be representative. In the US framework, there are two distinct areas of concern: (1) the size of ownership in publicly owned firms and (2) national security issues. Regarding size of investments, there is a long-standing body of law relating to the size of ownership of public firms that must be publicly acknowledged. Currently an acquisition of more than 5% of a publicly owned corporation requires a 13(d) of the Securities Exchange Act of 1934 filing (Securities Exchange Act, 1934). However, SWFs do not have to meet the more stringent requirements of registered investment companies. Investment disclosure, then, is up to the individual SWF and these policies vary considerably, as Truman's scoring clearly indicates. In addition, multiple aligned SWFs may own just less than 5% ownership and thus avoid the filing requirement.

Slawotsky (2009) argues that the inherent dangers of sovereign ownership of domestic firms should require that all holdings of SWFs from the same country, and all holdings of SWFs of aligned (explicit or tacit) countries (e.g., OPEC or GCC countries), should be aggregated and treated as one and new thresholds applied.[59] The number of distinct SWFs varies by country. The UAE and sub-national government units have nine SWFs, and Singapore has two (Truman, 2010, p. 16). There is great variation in the investment strategy of SWFs as well. China's Chinese Investment Corporation manages over a trillion USD, investing heavily abroad, and has a TTS of 74. Whereas China's SAFE Investment Company also manages over a trillion USD and is unscored by Tuman and has a LMTI of 2. The Government of Singapore Investment Corporation GSIC), manages USD 847 billion for the Singapore government and invests predominately abroad, while Temasek Holdings,

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focuses on investing in emerging Asia, has about USD 295 billion with about two-thirds invested abroad.[60] The varying number of SWFs in different countries, diverse investment strategies, and legal ownership status complicate a recipient country's perceptions and response to SWF investments.

Another related concern, hardly acknowledged or addressed, is the actions of agents of sovereign wealth funds. For example, in February of 2011, it was reported that the China Investment Corporation (CIC) and the State Administration of Foreign Exchange (SAFE) employed a company called "SSBT OD05 Omnibus Account Treaty Clients" to invest USD 19.4 billion in seven major Japanese companies. This obscure company was listed as one of the top ten holders of each of the Japanese companies.[61] A similar "distant owner" transaction may involve a company that is a joint venture outside the boundaries of one of the joint venture partners that may be providing advanced technology. The joint venture itself then may receive SWF investments that could influence the activities of the joint venture with regard to technology transfer, production decisions and so forth.[62] When the joint venture's host country has weak monitoring practices and the technology provider's home country is too far removed to effectively monitor the use of the technology, sensitive transactions may take place unnoticed.

Despite the conflict between welcoming investment policies and national security issues and the lack of transparency and potential political behavior, Epstein and Rose (2009) argued that new regulation was not necessary (at that time). The "nightmare scenarios" that critics of SWFs warn against are unlikely and if they occur will be identified by existing laws—either existing business regulation of securities and antitrust or national security laws. For the US, the Foreign Sovereign Immunities Act, or any existing international law, does not provide immunity from existing US law. Specific national security concerns are addressed in several ways (See Lee, 2009). Three acts generally address foreign investment and national security issues in the US: the Defense Production Act of 1950 (Defense Production Act, 1950), the Exxon Florio amendment in particular, the Foreign Investment and National Security Act of 2007 (Foreign Investment and National Security Act, 2007), and the Foreign Investment Risk Review Modernization Act of 2018 (Foreign Investment Risk Review Modernization Act, 2018). The National Defense Authorization Act of 2021 (National Defense, 2021) does not regulate foreign investment but does require the US Department of Defense to identify foreign military firms.

The Foreign Investment and National Security Act of 2007 (FINSA) (Foreign Investment and National Security Act, 2007) requires additional scrutiny and higher-level clearances for transactions that may result in a foreign entity controlling a company engaged in interstate commerce.[63] These investments are reviewed by the interagency Committee on Foreign Investment in the US, CFIUS, which is designed to review investments in a way that assures national security issues are addressed without hindering participation in US capital markets.[64] The CFIUS may block a transaction or require mitigation. For example, require that the SWF remain passive or the recipient company withhold sensitive information from the SWF investor. But what type of transactions should be scrutinized?

Moran (2009) identifies three distinct threats that the CFIUS must, in his view, focus upon: (1) any acquisition that would lead to US dependency on a foreign supplier of goods or services who may delay, deny, or place conditions upon the provision of those goods, (2) any proposed acquisition that would transfer technology or expertise to a foreign government that may then use it to harm the US, (3) any acquisition that would insert a means for infiltration, surveillance or sabotage (human or otherwise) in goods and services crucial to the functioning of the economy. He concludes that while the vast majority of foreign transactions pose no risk, cases on the margin are likely to remain problematic.[65] Hindelang and Pohl (2023) note that there "is not a common set of principles

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for assessing risks and threats to national security that may be posed by FDI and balancing those risks and threats against the economic interests of private parties concerned and society at large." As a result, and because recipient-country regulation varies widely, it is difficult to analyze whether instruments of foreign investment control are effective tools of international economic statecraft. This remains an unsettled question.

In Europe, the issues are taken up by the EU and the OECD. The EU Foreign Direct Investment Screening Regulation of 2019 (The EU Foreign Direct Investment Screening Regulation, 2019) provides a framework for screening on the basis of national security and public interest.[66] It provides an EU-wide mechanism for sharing information as both the EU and individual countries screen investments, with the individual country making all final decisions.[67] The same processes apply to SWFs with emphasis on transparency and governance.

8.2. Investment Screening vs. Investment Protectionism

While recipient-country national security concerns are legitimate, many argue that there are sufficient legal tools to address these issues without intruding into investment policy issues. The OECD initiated a lengthy review of issues under the Freedom of Investment Process in 2006 and issued several reports including the *OECD Guidelines for Recipient Country Investment Policies Relating to National Security* approved by the governments in 2008, designed to prevent investment protectionism, and ensure that SWF investments are received in a non-discriminatory fashion. The OECD framework for host-country treatment of SWFs argues that SWFs should be regarded just as other institutional investors, complying with *OECD Investment Guidelines* requiring adherence to the principles of transparency, non-discrimination, liberalization, and standstills. These have been regularly updated.[68] In addition, transparency/predictability, regulatory proportionality, and accountability of recipient-country treatment of SWF activities are also emphasized. Here, recipient-country transparency/predictability requires "codification and publication of laws regarding investment, prior notification to interested parties about plans to modify investment strategies, consultation of these strategies with other counterparts and the disclosure of investment policy actions." The regulatory proportionality principle requires that recipient-country restrictions on investment should not be greater than is needed to ensure national security.[69] And, the accountability principle is a mechanism to guarantee periodic regulatory impact assessments, parliamentary oversight, and other supervisory activities.[70] OECD countries, including the US, readily meet nearly all aspects of these principles in general, but take widely varying routes to do so.

With respect to investment protectionism, issues regarding sovereign wealth fund investments are well understood but SWF home-country, as well as recipient-country, policies vary substantially. The root cause of concerns remains the lack of transparency and accountability of SWFs and the extent they are utilized as a vehicle for financial statecraft.

9. Summary and Conclusions

Most sovereign wealth funds convert natural resource wealth into more "spendable" financial assets for the benefit of the home country, broadly defined. As a group they are very heterogeneous and have differing goals and objectives. Their actions may accelerate domestic development programs and provide resources for future generations. As global investors, they facilitate the flow of international capital. However, as sovereign entities, their actions may be politicized, disrupting market-determined resource flows, be anticompetitive, and threaten the national security of host countries. These actions are all essentially incompatible with the principles of democratic free market economies. Further, the level of transparency varies, with autocratic regimes being less transparent, and the

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lack of transparency and accountability for many SWFs arouses suspicions of all SWFs. The lack of transparency also provides an opportunity for corruption at massive scale.

While there have been discussions of the formation of an international regulatory body for decades, there has been no real progress. The Santiago Principles, created by the International Forum for Sovereign Wealth Funds (IFSWF), are widely recognized guidelines but are voluntary, as is membership in the IFSWF itself. The Principles are dated and not enforceable and individual country incentives do not align to enable external regulatory compliance. Given the significant domestic cultural, socio-economic, and political systemic differences that provide the foundation for governance and accountability, persistent differences in transparency and governance between free market democratic countries and autocratic countries appear unresolvable. The highly varying objectives of individual SWFs compound attempts for international regulation. Bilateral state power relations will dictate the role of SWFs with respect to individual firm or sectoral investments vis-à-vis partner countries. Cohen (2009) argued that an international regulatory organization is not feasible; simply a mirage. A forum to provide generally accepted definitions, risk assessment methods, and dispute resolution would be the likely best outcome for global observation and monitoring of SWF activities followed by individual country enforcement actions. As a result, host-country domestic regulations are essential and will vary widely from country to country and over time depending on international politico-economic relationships, with political considerations becoming more important. Despite the benefits of facilitating international capital mobility and economic development, the lack of transparency and accountability masks the potential for disruptive, anti-competitive behavior, national security threats, and corruption. Real economic and national security threats remain, and individual countries must be diligent in maintaining their own security interests when assessing the potential benefits of SWF investments and acquisitions.

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Appendix A

Table A1. 50 largest (AuM) Sovereign Wealth Funds. This table provides fundamental information on the 50mnlargest SWFs based on assets under management. Estimates of assets undermanagement by SWFI, Global SWF and the SWF itself, when available. In addition, for transparency the Tuman SWF Scoreboard (TTI), the Linaburg–Maduell Transparency Index (LMTI) and the GSR Score are reported. Country characteristics, the Democracy Index, and the Autocracy Score are reported. Details are provided in the notes to this table.

Rank (Assets Under Management)	Sovereign Wealth Fund	Country	Estimated or Reported Assets (USD Billion)			Transparency Indices			Country Characteristics	
			SWFI (2025) [1]	Global SWF (2025) [2]	SWF Itself, Circa (2023–2024) [3]	Truman SWF Scoreboard, 0–100 (2019) [4]	Linaburg–Maduell Transparency Index, 0–10 (2024) [5]	GSR Score, 0–25 (2024) [6]	Democracy Index 0–10 (2024) [7]	Autocracy Score 0–10 (2018) [8]
1	Norway Government Pension Fund Global	Norway	1739	1743	1739	100	10	24	9.81	0
2	China Investment Corporation	China	1332	1332	1330	74	7	20	2.11	7
3	SAFE Investment Company	China	1090	1358	NA	NA	2	4	2.11	7
4	Abu Dhabi Investment Authority	UAE	1058	1110	NA	65	6	14	3.07	8
5	Kuwait Investment Authority	Kuwait	1029	969	NA	70	6	10	2.78	7
6	Public Investment Fund	Saudi Arabia	925	925	765	39	6	24	2.08	10
7	GIC Private Limited	Singapore	801	847	NA	64	7	16	6.18	4
8	Badan Pengelola Investasi Daya Anagata Nusantara	Indonesia	600	NA	NA	NA	NA	NA	6.44	0
9	Qatar Investment Authority	Qatar	526	524	NA	46	5	18	3.17	10
10	Hong Kong Monetary Authority Investment Portfolio	Hong Kong (China)	514	526	NA	70	8	22	5.09	NA
11	National Council for Social Security Fund	China	414	424	NA	NA	5	8	2.11	7
12	Investment Corporation of Dubai	UAE	341	380	NA	64	5	14	3.07	8
13	Mubadala Investment Company	UAE	302	330	302	75	10	23	3.07	8
14	Temasek Holdings	Singapore	288	288	291	79	10	25	6.18	4
15	Turkey Wealth Fund	Turkey	279	190	320	68	6	19	4.26	4
16	Abu Dhabi Developmental Holding Company	UAE	225	225	NA	65	5	18	3.07	8
17	Korea Investment Corporation	South Korea	189	207	189	85	8	23	7.75	0
18	National Development Fund of Iran	Iran	157	162	132	56	4	13	1.96	7
19	Future Fund	Australia	150	204	180	87	10	22	8.85	0
20	National Welfare Fund	Russia	133	NA	NA	51	NA	NA	2.03	5

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Table A1. *Cont.*

Rank (Assets Under Management)	Sovereign Wealth Fund	Country	Estimated or Reported Assets (USD Billion)			Transparency Indices			Country Characteristics	
			SWFI (2025) [1]	Global SWF (2025) [2]	SWF Itself, Circa (2023–2024) [3]	Truman SWF Scoreboard, 0–100 (2019) [4]	Linaburg–Maduell Transparency Index, 0–10 (2024) [5]	GSR Score, 0–25 (2024) [6]	Democracy Index 0–10 (2024) [7]	Autocracy Score 0–10 (2018) [8]
21	Emirates Investment Authority	UAE	91	102	NA	36	3	7	3.07	8
22	Samruk-Kazyna	Kazakhstan	81	79	81.17	64	10	18	3.08	6
23	Dubai Investment Fund	UAE	80	80	NA	NA	NA	18	3.07	8
24	Brunei Investment Agency	Brunei	73	65	NA	30	1	2		NA
25	State Oil Fund of Azerbaijan	Azerbaijan	60	60	49.03	92	10	7	2.8	7
26	Kazakhstan National Fund	Kazakhstan	56	65	55.7	NA	2	4	3.08	6
27	Oman Investment Authority	Oman	50	50	50	NA	4	14	3.05	8
28	New Zealand Superannuation Fund	New Zealand	48	46	43.14	94	10	25	9.61	0
29	Ethiopian Investment Holdings	Ethiopia	45	46	NA	NA	5	8	3.24	2
30	Libyan Investment Authority	Libya	40	68	68.4	23	4	13	2.31	NA
31	Khazanah Nasional	Malaysia	36	32	30.68	NA	6	18	7.11	7
32	National Wealth Fund, UK	UK	36	36	34.75	NA	NA	NA	8.34	0
33	CNIC Corporation Limited	Hong Kong (China)	33	NA	NA	NA	NA	NA	5.09	NA
34	Hong Kong Future Fund	Hong Kong (China)	28	NA	NA	NA	NA	NA	5.09	NA
35	Beijing State-Owned Assets Management Co., Ltd.	China	28	NA	NA	NA	NA	NA	2.11	7
36	Russian Direct Investment Fund	Russia	25	28	NA	37	7	4	2.03	5
37	Nuclear Waste Disposal Fund	Germany	23	26	24.91	NA	NA	24	8.73	0
38	Fund for Reconstruction and Development of Uzbekistan	Uzbekistan	23	NA	23.61	NA	NA	4	2.1	9
39	Azerbaijan Investment Holding	Azerbaijan	22	37	NA	92	NA	7	2.8	7
40	Polish Development Fund	Poland	20	20	NA	NA	NA	16	7.4	10
41	Mumtalakat Holding	Bahrain	18	18	16.8	55	10	12	2.47	10
42	Malta Government Investments	Malta	17	2	NA	NA	NA	3	7.93	NA
43	Timor-Leste Petroleum Fund	Timor-Leste	17	19	18.91	91	9	12	7.03	1
44	Revenue Regulation Fund	Algeria	16		NA	26	1	NA	3.55	1

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Table A1. *Cont.*

Rank (Assets Under Management)	Sovereign Wealth Fund	Country	Estimated or Reported Assets (USD Billion)			Transparency Indices			Country Characteristics	
			SWFI (2025) [1]	Global SWF (2025) [2]	SWF Itself, Circa (2023–2024) [3]	Truman SWF Scoreboard, 0–100 (2019) [4]	Linaburg–Maduell Transparency Index, 0–10 (2024) [5]	GSR Score, 0–25 (2024) [6]	Democracy Index 0–10 (2024) [7]	Autocracy Score 0–10 (2018) [8]
45	Ireland Strategic Investment Fund	Ireland	16	19	15.09	85	8	25	9.19	0
46	Sociedad Estatal de Participaciones Industriales	Spain	15	NA	17.23	NA	NA	NA	8.13	0
47	The Sovereign Fund of Egypt	Egypt	12	2	NA	NA	4	11	2.79	4
48	Sharjah Asset Management Holding LLC	UAE	10	3	NA	NA	NA	6	3.07	8
49	Future Ireland Fund	Ireland	9	NA	NA	NA	NA	NA	9.19	0
50	Maharlika Investment Fund	Philippines	9	NA	NA	NA	NA	NA	6.63	0
	Median Value		58	80	62	65	6	14	3	7

Note: Only national level funds are included. [1,2,3] Total asset values for SWFs are obtained from the Sovereign Wealth Fund Institute, Global Sovereign Wealth Fund (GSWF), as well as from SWFs' annual reports and official websites. SWF rank is based on assets under management as reported by the Sovereign Wealth Fund Institute (SWFI). [4] The Truman SWF Scoreboard is provided by the Peterson Institute for International Economics. It ranges from 0 to 100. The Truman SWF Scoreboard is from 2019, the last date available. [5] The Linaburg–Maduell Transparency Index is from SWFI. It ranges from 0 to 10 and the last date available is 2024. [6] The Governance, Sustainability, and Resilience (GSR) Index is from the Global Sovereign Wealth Fund (GSWF). It ranges from 0 to 15 and the last date available is 2024. [7] The Democracy Index is from the Economist Intelligence Unit. It ranges from 0 to 10 (most democratic) and 2024 is reported here. [8] The Autocracy Score is from the Center for Systemic Peace and ranges from 0 to 10 (most autocratic). Data and scores used from SWFI and GSWF were retrieved from their websites on 22 March 2025.

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Notes

1 For the 50 largest SWFs (narrowly defined) listed in the Appendix A, assets under management estimated by Sovereign Wealth Fund Institute. Note, other individuals and institutions also estimate assets under management but the SWF definitions and samples, inter alia, varies.

2 See Kuwait Investment Authority (2025). There were much earlier special purpose funds or trusts but none are comparable in scope or scale to KIA. Also many authors mention sub-national state or provincial funds, e.g., state level public school or university funds in the US, but we focus only on national level funds herein.

3 Appendix A Table A1.

4 See Rose (2023b, Table 1) for details of ten major investments of SWFs in the US, mainly financial sector firms, in 2007 and 2008. See also Černohorský and Tesnerová (2020, Figure 3). In the end some investments proved ill advised. For actual earnings and financial peromance of SWFs see regular reports by Preqin, like Preqin (2023).

5 See Divakaran et al. (2022) and chapters therein for description and analysis of SIFs, their definition and distinctions from SWFs.

6 See the more detailed discussion of transparency in Section 4 and country characteristics in Section 5, below.

7 See Megginson and Gao (2019) for a recent review of research on sovereign wealth funds and earlier works by Megginson for regular reviews. Also see Ouni et al. (2020b).

8 For example, see Megginson et al. (2023) which includes a brief survey and analysis of how SWFs invest assets geographically and across asset classes. Also see the Special Issue in Volume 6 of the *Journal of International Business Policy* (2023) for several papers on SWF issues. Most of the papers there are cited throughout this paper.

9 Bahoo et al. (2020) analyzes 184 articles. The focus is more on bibliometric techniques, author contributions and so forth, rather than concrete analyses of SWFs. Mami (2023) focuses more on identifying research themes or "Meta-narratives." She analyzes 75 papers dealing with commodity funds of resource rich SWFs from 2000 to 2021.

10 See Maire et al. (2021) for their latest transparency rankings and governance issues and Ouni et al. (2020a).

11 See Bremmer (2009) for an early alert to this issue.

12 For a recent example see Areddy et al. (2025).

13 Blundell-Wignall et al. (2008). A more elaborate definition, by the International Working Group on Sovereign Wealth Funds (now the International Forum of Sovereign Wealth Funds) is SWFs are defined as special purpose investment funds or arrangements, owned by the general government. Created by the general government for macroeconomic purposes, SWFs hold, manage, or administer assets to achieve financial objectives, and employ a set of investment strategies which include investing in foreign financial assets. The SWFs are commonly established from balance of payments surpluses, official foreign currency operations, the proceeds of privatizations, fiscal surpluses, and/or receipts resulting from commodity exports International Working Group of Sovereign Wealth Funds (2008). See Rose (2023a) for an overview of the definitions of SWFs in the context of the Santiago Principles, discussed further below.

14 For the most part, funds which strictly finance national pension systems, Public Pension Reserve Funds (PPRFs) like Social Security Reserve Funds (SSRFs) funded by contributions in excess of current payouts, such as the US Social Security Trust Fund, or Sovereign Pension Reserve Funds (SPRFs) like the Australian Future Fund, funded by direct government transfers, and state or provincial level public pension funds, are not of concern in this paper even though they are often referred to as SWFs. Kimmitt (2008) offers a simpler categorization of sovereign investment: international reserves, public pension funds, state-owned enterprises, and SWFs which may be further disaggregated by source of funds, resource revenues, balance of payments surpluses, etc.

15 e.g., see Al-Hassan et al. (2013), Table 1 for a comparison of stabilization funds vis-à-vis savings funds.

16 See López (2023) for further discussion.

17 In Kazakhstan four banks, several construction/real estate ventures and a major agricultural enterprise were fully or partially nationalized and/or recapitalized (the operations resulted in a transfer of funds of about USD5 billion in 2008, USD1.8 billion in 2009 and the purchase of about USD4 billion in Samruk Kazyna bonds by the National Oil Fund).

18 See Divakaran et al. (2022) for a detailed overview of sovereign strategic investment funds. While they may be similarly problematic, they are not the main focus of this paper.

19 See Henagan (2025) for a recent critical discussion of proposals to create a SIF in the US.

20 Lenihan (2014) offers a summary of these discussions in her overview. Fotak et al. (2013) offers a comprehensive review of definitions of SWFs at that time. The activities of SWFs have evolved dramatically since then. Herein, we will not distinguish among all the variants and instead emphasize the heterogeneity of entities labeled SWFs.

21 While the Santiago Principles are often labeled "generally accepted accounting standards" for SWFs they are voluntary and rarely fully abided by.

22 Notes to Table 1 provide definitions and sources for all variables. With respect to country characteristics, here countries are labeled or scaled on measures of democracy and autocracy. Recently though, in the "new cultural economics" deeper measures

of culture are proving important determinants of economic behavior. The persistence of poor institutions is of particular interest and worth exploring further. See Gershman (2017) for an overview of the recent literature.

[23] But not the largest. BlackRock, Inc. reported 4th quarter, 2024 results noting they held USD11.6 trillion in assets under management. https://ir.blackrock.com/news-and-events/press-releases/press-releases-details/2025/BlackRock-Reports-Full-Year-2024-Diluted-EPS-of-42.01-or-43.61-as-Adjusted-Fourth-Quarter-2024-Diluted-EPS-of-10.63-or-11.93-as-Adjusted/default.aspx (accessed on 1 January 2026)

[24] His efforts have gone through several iterations, the most detail is provided in Truman (2010), followed by several updates in Peterson Institute Policy Briefs, the latest in 2021. He also compares the components of his index to the Santiago Principles, discussed below, and looks at correlation with other measures. Bagnall and Truman (2013) presented updates to the Truman scores and for comparison calculated scores based on the Santiago Principles. Maire et al. (2021) provides the most recent scores with additional discussion of specific elements of the score. They note that transparency scores have been improving over time, but issues remain and many SWFs, some quite large, remain opaque.

[25] Note the Center for Governance of Change, IE University also regularly reports on Sovereign Wealth Funds, but not transparency per se. See their annual reports, such as Aguilar et al. (2024) and individual papers such as Johnson (2025). Aguilera et al. (2016) also provides an analysis of SWF characteristrics and implications for governance. The Sovereign Investment Lab at Bocconi University also regularly publishes analyses of SWFs.

[26] See Truman (2010), Chapter 5 for details of the original efforts. The process has been refined and updated since.

[27] These differ from the Top 50 SWFs listed in the Appendix A and tables in the text below, because many are much smaller in terms of AuM. Also note they use a score of 80 or higher as transparent. In the analysis below a score above the median is considered more transparent and below the median as less transparent.

[28] Truman (2010, Table 5.2) finds similar differences for scores reported then.

[29] Differences in culture and political structure as a determinant of the origins and operations of SWFs is discussed further in Section 5 below. Wang and Li (2016) focuses on democracy and institutionalization of SWFs

[30] The Santiago Principles may be found at http://www.imf.org/external/np/pp/eng/2008/022908.pdf (accessed on 12 January 2025). Rose (2023a) provides areview of the discussions and negotiations of the members of the International Working Group of SWFs in creating the Santiago Principles.

[31] See IMF (2008), International Working Group of Sovereign Wealth Funds (2008), OECD (2008a, 2009a, 2009b). Gray (2007) provides an overview of the OECD perspective and a good source of relevant OECD documents for this period.

[32] There are Full and Associate members. Membership may be found at https://www.ifswf.org/our-members (accessed on 12 January 2025).

[33] Their Figure 2, p. 131, original source Behrendt (2010).

[34] They were British protectorates. Kuwait became independent in 1961, the others in 1971.

[35] Braunstein (2017) provides a detailed review of the creation and activities of SWFs in each country and how the domestic political goals and strategies influence the specific activities of the SWF.

[36] For further discussion of a general nature see Lu et al. (2010).

[37] https://www.bbc.com/news/business-54597256 (accessed on 12 January 2025).

[38] See Young (2020) for an analysis of the changing state-society relations, "rentierism" in countries with SWFs and how the safeguarding of wealth is being displaced by higher risk strategies claimed to be diversifying local economies. Her focus is on Saudi Arabia.

[39] The survey of perceptions of SWFs by Hill & Knolton and Penn Schoen Berland (2010) attempts to address this issue. It is noted that "At a time of great volatility and uncertainty, sovereign wealth funds represent an extremely important source of capital for the global economy. Despite this importance, many nations appear to view these funds with caution, and no matter how large the pool of funds on offer, some SWFs could find their path to the most attractive investments blocked."

[40] For the reaction to criticisms and how SWFs may have changed see the case studies in Bazoobandi (2012).

[41] These guidelines are overseen by a Council of Ethics established by Royal Decree in 2004 and subsequently revised. See Backer (2009, p. 1277), for early discussions. See Norges Bank Investment Management (2025), for current guidelines. The owner of the Fund is the Ministry of Finance on behalf of the Parliament and the Norwegian people. It is managed by Norges Bank Investment Management, a division of the National Bank. See https://www.nbim.no/en/about-us/about-the-fund/ (accessed on 12 January 2025).

[42] Slawotsky (2009, p. 1241). Indeed this has happened frequently. See Dewenter et al. (2010) discussed below. Venkat et al. (2010). A move by SWF, Malaysia's Khazanah Holdings offering USD 2.6 billion to buy a stake in Singapore hospital operator Parkway Holdings Ltd. that it does not already own, prompted India's Fortis Healthcare Ltd. to abandon its own takeover efforts and relinquish control of the company. Zuckerman (2011) relates that Kuwait Investment Authority and Government of Singapore Investment Corporation paid several hundred million dollars for a 4.5% stake in TPG Holdings, a private-equity "powerhouse"). There are numerous additional examples.

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[43] Venkat et al. (2010). A move by SWF, Malaysia's Khazanah Holdings offering USD 2.6 billion to buy a stake in Singapore hospital operator Parkway Holdings Ltd. that it does not already own, prompted India's Fortis Healthcare Ltd. to abandon its own takeover efforts and relinquish control of the company. Zuckerman (2011) relates that Kuwait Investment Authority and Government of Singapore Investment Corporation paid several hundred million dollars for a 4.5% stake in TPG Holdings, a private-equity "powerhouse"). There are numerous additional examples including rcently by the US and Saudi Arabia Lipton et al. (2025).

[44] They also provide evidence of SWF post investment influence (for a different sample of 172 transactions). Table 12, p. 274 presents investments made and then follow-on related activities and transactions initiated by the SWF or a firm that in which it had acquired a significant position. Table 13, p. 276 lists SWF activities which affected the normal business operations of the firm.

[45] Dewenter et al. (2010) mentioned above, Kotter and Lel (2011), Sojli and Tham (2011) and Bortolotti et al. (2015).

[46] See Park and Estrada (2009) Section C for a discussion of large investments made by SWFs in US financial institutions during the financial crisis.

[47] Truman (2010, pp. 46–52) discusses market turmoil and uncertainty. Kotter and Lel (2011) find a positive announcement effect on the share price of recipient firms when a SWF invests in them, with the more transparent the SWF is, the greater the effect. Sun and Hesse (2009), however, find no effect on equity markets due to SWF investing.

[48] On opacity see Fukase (2011) discussed below.

[49] The Wassenaar Arrangement is a group of countries that promote transparency and greater responsibility in the transfer of weapons and dual se technologies. See https://www.wassenaar.org. Also, the National Defense Authorization Act (NDAA) of 2021 (National Defense, 2021) now requires the Defense Department to identify foreign "military companies," civilian or state owned.

[50] See Figures 4.4 and 4.5 for a snapshot of these networks.

[51] Of course, one might artherein gue that it was simply a firm exercising monopoly power over the natural gas transmission lines that it controls and timing was just coincidental as Epstein and Rose (2009) seem to imply.

[52] Drezner (2008, p. 118). He provides a broad survey of economic and security concerns.

[53] Anderlini (2008) and certainly many since then.

[54] Slawotsky (2009) seems to suggest that the terms of the bailout of FNMA and GNMA favored China, which had very large positions in each. Avendano and Santiso (2009) find that SWFs invest essentially the same as a group of mutual funds, and primarily for financial purposes, but importantly in both cases, the sample of SWFs is critical for that conclusion to stand. See Cuervo-Cazurra et al. (2023) for a recent review of SWF non-business objectives and discreet power. And, see Lenihan (2014) and discussion below.

[55] References in her paper provide numerous examples of SWF politically motivated actions.

[56] Note at the time of this article economic power was of interest rather than military power. This of course was prior to the Russian invasion of Ukraine and the terror attacks in Israel leading to the on-going war there.

[57] Given the appropriate transparency and disclosures OECD guidelines then argue that recipient countries should treat SWFs just as any other domestic firm, the "principle of regulatory proportionality."

[58] See also Thatcher and Vlandas (2016) for a discussion of policies in France and Germany.

[59] See the many references to Slawotsky (2009) for examples.

[60] Singapore's set up with the GISC managing government assets, but not owning them, and Temasek, owning assets and managing them are both private companies incorporated under Singapore's Companies Act (Singapore's Companies Act, 2006), Lee (2009).

[61] See Fukase (2011). This article describes a USD 19.4 billion investment in seven major Japanese companies by an "obscure shareholder by the name of 'SSBT OD05 Omnibus Account Treaty Clients' now listed as one of the top ten holders of these companies shares. Sovereign wealth fund China Investment Corporation is one presence behind SSBT OD05 and The State Administration of Foreign Exchange, SAFE, which manages approximately USD 3 trillion in foreign reserves is also behind SSBT OD05 according to Japan Shareholders Services.

[62] See Haberly (2011) network mapping analysis and Areddy et al. (2025) for recent example of Chinese port acquisitions.

[63] See Bahgat (2010, p. 235), and Epstein and Rose (2009, p. 118), and Rose (2023a) for additional details.

[64] See Rose (2015) and Moran (2009) for an extensive review and critique of the CFIUS process. Rose (2023b) provides a broader overview.

[65] Note from Beck and Fidora (2008) that at that time the UAE then owned 8% of Advanced Micro Devices. Now they own about 20% and have built an extensive network of inter-related chip related companies. See Haberly (2011)

[66] See Hindelang and Pohl (2023), the annual report on the CELIS Forum. The CELIS Institute produces regular reports and articles on investment screening, in particular on national security issues, and hosts an annual conference on investment screening, *inter alia*.

[67] The framework for FDI screening was last updated in 2024. See https://policy.trade.ec.europa.eu/enforcement-and-protection/investment-screening_en (accessed on 12 January 2025).

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[68] See OECD (2008c). The broader OECD Guidelines for Multinational Enterprises were last updated in 2023.

[69] Further, "they should be avoided when other existing measures are adequate and appropriate to address national security concerns. Most countries assign little or no role for investment policy in managing the national security risks. Among those countries that do use investment policy for protecting national security, risks to be addressed through investment reviews included: infiltration of the national economy by organized crime or terrorists; loss of control of key resources needed for national defense, impeding law enforcement, and loss of control of border or security sensitive geographic locations." Other threats that several countries explicitly state as concerns warranting legal restraints include threats related to: money laundering; protection of state secrets; diversion of strategic capabilities for military purposes; investments which might hinder efforts of international organizations to maintain international peace and security. OECD (2008b).

[70] See OECD (2008c) for a more detailed description of the policies for Sovereign Wealth Funds and recipient-country policies, OECD (2008b) for the OECD declaration on Sovereign Wealth Funds, the Freedom of Investment Process and the OECD General Investment Policy Principles.

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Perspectives on Migration and Financial Markets Research

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Abstract: This study comprehensively analyzes the relationship between migration and financial markets. We examine existing research on this subject using a scientometric and bibliometric approach. By employing VOSviewer and Bibliometrix tools, we introduce a novel methodology that enhances comprehension of this intricate relationship. The findings underscore two significant outcomes. Firstly, the impact of migration on financial markets is evident through the substantial flow of remittances and microfinance. Secondly, this study uncovers challenges hindering the integration of migrants into formal banking systems, thereby affecting financial market dynamics. This research deepens our understanding of migration's implications on financial markets, offering practical insights that can guide policymakers and financial institutions in their decision-making processes.

Keywords: migration; financial markets; remittances; globalization; world economy

1. Introduction

Migration and financial markets are two important and interconnected aspects of the global economy (United Nations et al. 2005). The migration concept encompasses factors related to place of origin and destination, intervening obstacles, and personal characteristics (Lee 1966). These include the economic and financial possibilities of the migrant and the places of origin and destination, which are considered within the financial markets. Thus, it is a complex relationship that depends on various factors, which opens a window into different ways of analyzing it.

With over 280 million migrants traversing borders in 2020 alone (United Nations 2020), this movement of people translates into substantial financial flows. These migrants contribute to the economies of their adopted countries and send vital financial resources back to their home countries. In 2020, this remittance flow reached a staggering USD 474 billion (The Global Migration Data Portal 2020), highlighting the profound impact migration has on global financial markets. This phenomenon influences exchange rates, investment patterns, and development strategies, making it a crucial area of study for understanding the interconnectedness of the modern world.

Driven by the growing focus on remittances, even the World Bank established a dedicated Migration and Remittances Unit. This unit works explicitly on improving the quality and volume of data on migration patterns, remittance flows, and future projections (Brown and Jimenez-Soto 2015). Nevertheless, the impact of migration does not end in the number of remittances that it promotes. Hence, this research examines the other branches of importance from a theoretical perspective.

On the one hand, migration has significant implications for financial markets. In this way, migration can impact financial markets through various channels, including remittances, labor market dynamics, and consumption patterns, which affect asset prices,

exchange rates, and investment patterns (Khan 2024). For instance, remittance flows from migrants can help boost economic growth and influence consumption patterns in both origin and destination countries, thereby helping to create new businesses and financial market development (Sobiech 2019; B. G. Mundaca 2009). On the other hand, financial markets can shape migration patterns by influencing job opportunities, investment climates, and risk perceptions (Heil 2020). Likewise, financial market development can make it easier for migrants to send remittances back to their home countries and offer investment opportunities that allow them to allocate savings into assets such as stocks, bonds, or real estate, thereby generating wealth and enhancing economic mobility (Bakker 2015). Moreover, financial innovations such as microfinance and mobile banking enable migrants to engage in financial activities remotely, regardless of geographical distance, thus promoting financial inclusion and empowerment. In this way, understanding this relationship is crucial for policymakers to design effective migration policies that promote economic growth and stability.

Also, the leading studies have shown that migration can significantly impact financial markets from different perspectives. Migration can lead to increased economic growth and productivity. For example, Kugler et al. (2018) found that migration reduces information friction among countries, which leads to increased financial flows. Helms and Leblang (2019) argue that migrants help expand trade investment flows, transmit skills and knowledge across countries, and facilitate financial flows. Zeitz and Leblang (2021) emphasized the role of migrants as facilitators of foreign investment in their home countries. In this line, these findings suggest that migration can positively affect financial markets, including increased financial market liquidity, reduced information asymmetry, greater access to capital, and increased economic growth. Likewise, migration can impact financial markets. For example, Ayadi et al. (2021) examined how migration influenced the performance of banks and led them to reconsider their business models, as well as their strategies, structures, and operations. Moreover, Katsaiti and Khraiche (2023) found an inverse relationship between the possibility of access to credit and the desire to migrate. As a result, we can infer that the relationship between the two concepts is interactive. In addition, Fernández-Romero et al. (2024) signaled the importance of the Sustainable Development Goals (SDGs), which are particularly relevant in migration and financial markets. Understanding the relationship between migration patterns and financial flows is crucial for achieving the SDGs, as remittances sent by migrants can contribute significantly to poverty reduction and economic development in their home countries.

To the best of our knowledge, the relationship between migration and financial markets has been unexplored in the existing body of knowledge. Thus, there is a suitable opportunity to analyze the current state of the art in this arena. Hence, this study aims to analyze the studies on the relationship between migration and financial markets using scientometric and bibliometrics techniques. Furthermore, this study establishes, using VOSviewer and Bibliometrix tools, a novel approach allowing for a better understanding of this relationship. To enhance comprehension and explore potential research in migration and financial market directions, this study addresses the following research questions (RQs).

First, we explore the historical evolution of migration and financial markets and their relationships. Therefore, we explore how these have interacted and influenced each other over time. This examination provides a foundation for understanding the ongoing implications of migration on financial markets. To accomplish this, we address the following questions:

RQ 1: What is the state of the art of migration and financial markets?
RQ 2: What are the central studies on migration and financial markets?

Second, we explore the most significant topics of migration and financial markets and discuss the development and growth of trends. We suggest a research agenda that will be particularly valuable for researchers in the migration and finance arena. Likewise, it will serve as a valuable source of information for policymakers. These topics can help identify

potential developments both in the practical and academic fields. Thus, we established the following research questions:

RQ 3: What are the trending topics in the migration and financial markets arena?
RQ 4: What are the research gaps and further research opportunities in the migration and financial markets arena?

Third, we analyze the leading researchers and cluster collaborative endeavors for producing joint research. Thus, we address the following question:

RQ 5: Who are the most significant migration and financial markets researchers?

This research notably contributes to the current knowledge body, offering practical and academic insights in two key dimensions. Primarily, from a methodological perspective, it stands as a pioneering study incorporating advanced scientometric and bibliometric techniques using VOS viewer and Bibliometrix and valuable databases, such as Web of Science (WoS) and Scopus, thus becoming the first study on migration and financial markets with these characteristics.

Based on this study, two key trends emerge from a review of prominent studies in this field. (1) A solid theoretical foundation is established. For example, Ayadi et al. (2021) analyzed the European Union bank database, highlighting migration's differential impact on banking models. Their empirical analysis showed that migration significantly influences the target business model in the financial markets. Similarly, Helms and Leblang (2019) adopted a holistic approach by analyzing global migration's multifaceted causes and consequences. They integrated perspectives from disciplines, such as economics, sociology, demographics, and others, to demonstrate that migration is a complex phenomenon beyond traditional sociological or economic boundaries. This built upon the foundational theoretical studies conducted by Lee (1966) and Mangalam and Schwarzweller (1968), who laid the groundwork for a comprehensive migration theory. (2) Diverse methodologies are employed to explore the empirical relationship between migration and financial markets. A study conducted by Ma and Pozo (2012) analyzed the impact of labor migration in developing economies with foreign banks employing an econometric model. Their findings suggested that banks from industrialized nations with large immigrant populations are more likely to expand into migrant-source developing countries. Zeitz and Leblang (2021) leveraged scientiometrics with a Poisson Pseudo Maximum Likelihood (PPML) approach to demonstrate the pivotal role of international migrants in shaping global investment patterns. In the same way, Gleisner et al. (2010) analyzed descriptive statistics to reveal a persistent tendency for migrants to favor domestic investment using a multinomial logistic regression to analyze the choice of bank nationality as a function of independent variables. They concluded that ethnic origin offers a strong comparative advantage for foreign banks. Katsaiti and Khraiche (2023) and Fernández-Romero et al. (2024) took a framing approach to analyze the relationship between the SDGs and migration in Spain. Their analysis of the five key SDGs themes (people, prosperity, planet, peace, and partnerships) revealed a lack of significant media interest in connecting migration with the 2030 Agenda. These studies highlight the ongoing development of a robust theoretical framework and the application of diverse methodological tools to explore the intricate relationship between migration and financial markets.

Moreover, this study analyzes a broad spectrum of relevant studies in migration and financial markets, enabling a comprehensive understanding of the main findings on this relationship. These facilitate the identification of prospective research avenues through network mapping and thematic cluster reviews, thereby supporting the empirical and theoretical exploration of emerging themes. In sum, this study establishes the research focus by examining migration and financial markets with their associated areas. Also, it introduces an innovative approach utilizing scientometric techniques to open a more extensive body of knowledge on migration and financial markets, thereby pushing the boundaries of existing knowledge. The outcomes of this study not only contribute to discerning current trends in this field but also establish a foundation for further research endeavors.

2. Materials and Methods

This study conducts a comprehensive scientometric review to analyze the relationship between migration and financial markets. A scientometric review involves a wide-ranging analysis of scholarly studies, primarily utilizing quantitative methods to assess scientific dynamics, structure, and impact within any research field (Chen and Song 2019). This study employs patterns, citation networks, co-authorship, and research productivity to uncover trends, highlight leading studies, and explain the progression of the knowledge frontier in the intersection between migration and financial markets. Using data from two of the most reputable academic sources, Scopus and WoS, the search equation included migration and financial markets in the following way: migration AND "financial market*". Until March 2024, 132 and 97 studies were identified, respectively. In addition, studies from other areas of knowledge that were not directly related to the object of study were eliminated, resulting in 157 studies. The Bibliometrix R-package was employed to merge both sets of search results into a database to establish a unified database. This process facilitated the removal of 27 duplicated studies. Afterward, all studies were retrieved and compiled within Mendeley for subsequent analysis and citation management. Additionally, a rigorous review process was conducted to ensure the coherence and relevance of the gathered information within the scope of this research.

To conduct the analysis, the leading techniques in scientometrics were employed, including examination of scientific production for science mapping and unpacking and knowledge in terms of its major topics, co-authorship analysis, co-citation analysis, bibliographic coupling, trends, sources, primary studies, significant researchers, and clustering, among others, as suggested (Lim and Kumar 2024). These scientometric techniques facilitated the following objectives: (i) identification of prominent researchers, institutions, countries, and sources; (ii) determination of seminal studies; and (iii) analysis of research trends within this domain. To carry out the above, the prominent scientometric software tools VOSviewer and Bibliometrix were used (Aria and Cuccurullo 2017; van Eck and Waltman 2017). Figure 1 depicts the literature search strategy used to carry out the study.

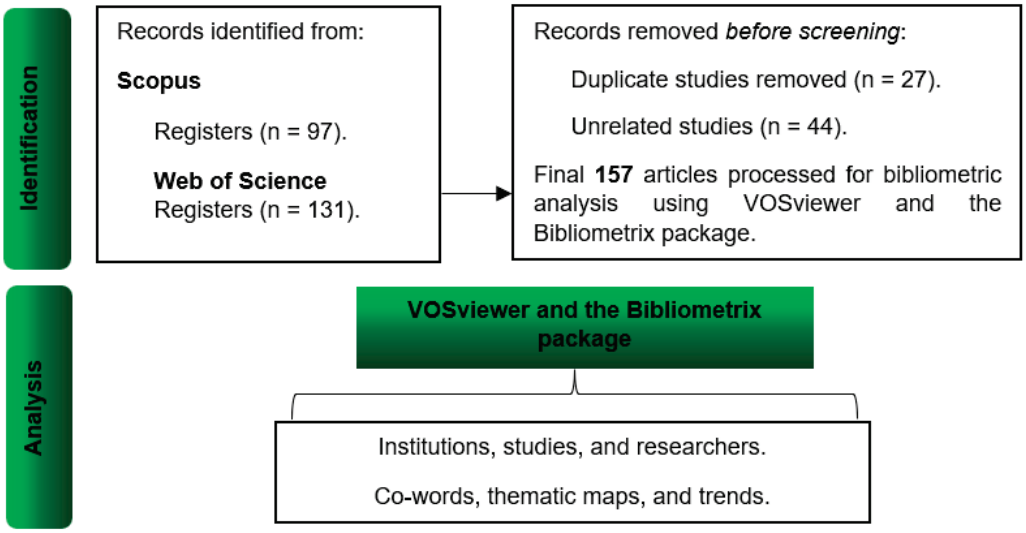


Figure 1. Literature search strategy.

3. State of the Art, Key Findings, and Implications of Migration on the Financial Markets

When studying migration and financial markets as an important component in economic growth, it is important to consider all perspectives to understand the object of study better. To carry out this study, 157 studies co-authored by 351 authors were analyzed. Notably, the mean age and mean citations per study stand at 7.7 and 9.1, respectively, suggesting that most studies were conducted in recent years with substantial contributions to the field. Table 1 summarizes the primary research elements on migration and financial markets.

Table 1. Summary of the studies analyzed. Source: Authors' own research using the Bibliometrix tool.

Description	Results	Description	Results
Main Information		Study Types (Continued)	
Timespan	1984: March 2024	Editorial material	2
Sources	129	Review	3
Studies	157	Study Contents	
Annual growth rate %	4.11	KeyWords Plus	529
Study average age	7.79	Author keywords	527
Average citations per study	9.1	Authors	
References	3980	Authors	351
Study Types		Authors of single-authored docs	53
Article	118	Authors Collaboration	
Article early access	1	Single-authored docs	56
Books/chapters	5/4	Co-authors per doc	2.31
Conference papers	29	International co-authorships %	14.01%

Figure 2 depicts a substantial upsurge in scholarly studies since 2003, highlighting the increasing attention on this subject within the academic domain. The annual growth trajectory has experienced a notable evolution, progressing from only one study published in 1984 to 20 studies in 2023. As of March 2024, five more studies have been published, indicating an expected continuation of this upward trajectory throughout 2024 and beyond. It is imperative, however, to disaggregate the annual publication patterns into two distinct periods. The initial period, spanning until 2003, witnessed modest research output, with fewer than twelve studies published annually, as shown in Figure 2. In contrast, from 2006 onward, publications have amounted to an average of 10 studies annually, representing a significant surge. This could be attributed to the major attention that scholars have paid to issues related to socio-economic aspects. For example, the COVID-19 pandemic was a milestone that has further boosted research in the social area. In this way, the impacts of recent socio-economic crises have underscored the critical importance of addressing the migration issue as a focal point for both developed and developing economies.

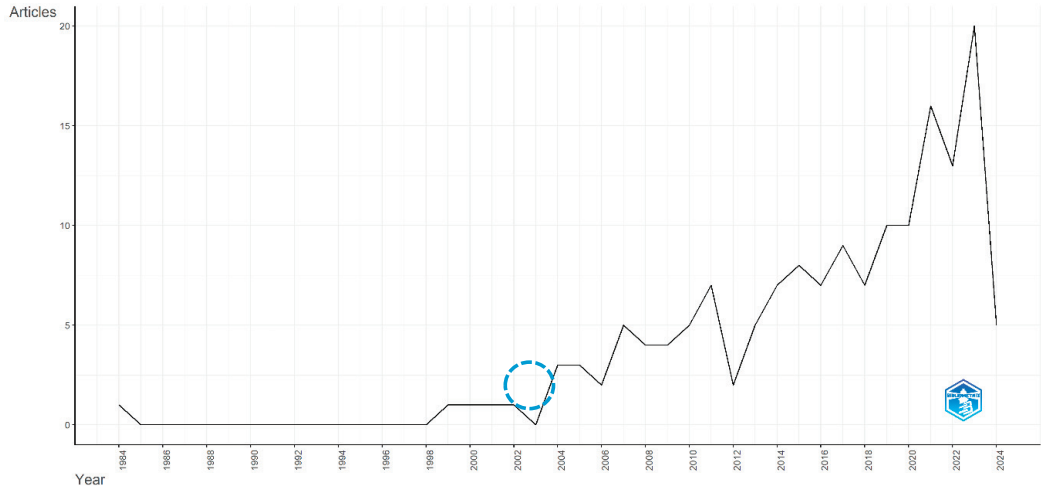
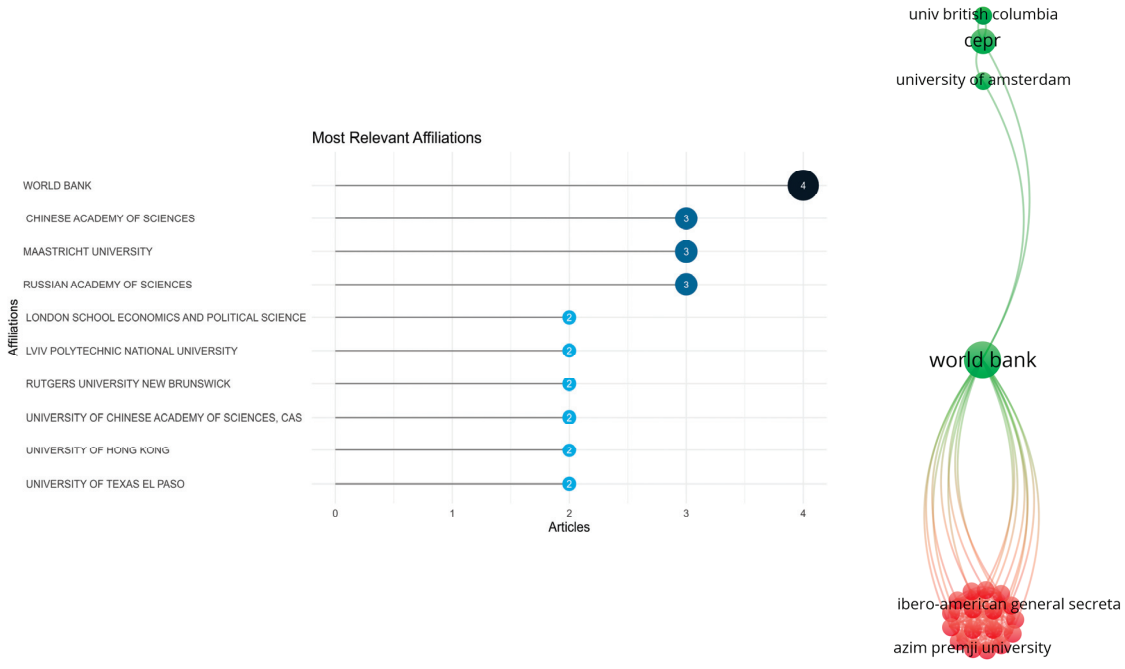


Figure 2. Annual scientific production on the migration and financial markets arena from 1984 to March 2024. Source: Authors' own analysis using Bibliometrix with the WoS and Scopus databases.

3.1. Main Countries and Institutions

Between 1984 and March 2024, researchers at 355 institutions actively studied migration and financial markets. The World Bank, followed by the Chinese Academy of Sciences, Masstrict University, the Russian Academy of Sciences, and the London School of Economics and Political Sciences, claim the top spots among institutions, having published 13 studies, as shown in Figure 3a. In the World Bank case, it is one of the leading institutions whose priority is countries' economic growth. Therefore, having a better understanding of the migration phenomenon and the development of financial markets makes it a pioneer in studies on this relationship. Figure 3b depicts the importance of the World Bank in studying this relationship. Its central location indicates its position as a leader and reference in this field of knowledge and its multiple collaborations with several universities.

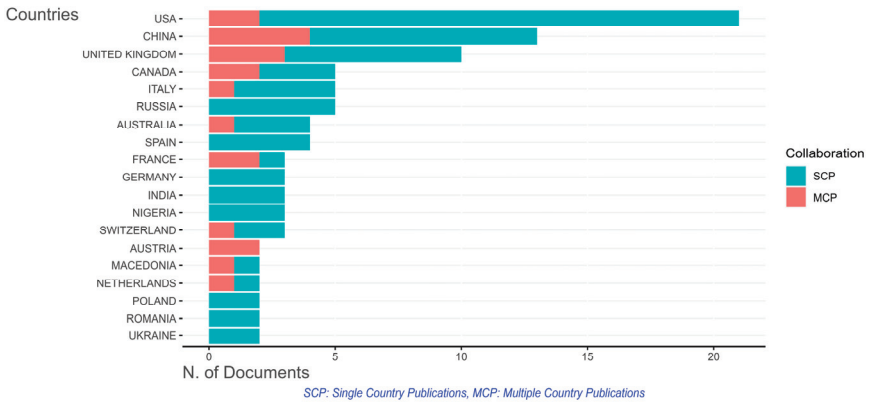


(**a**) (**b**)

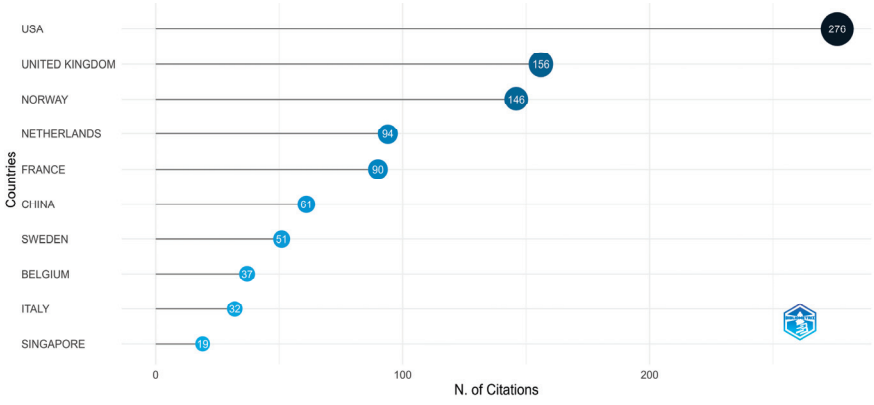
Figure 3. Leading institutions that published studies on the migration and financial markets arena: (**a**) Bibliometrix results and (**b**) VOSviewer results. Source: Authors' own analysis using Bibliometrix with the WoS and Scopus databases.

Based on the current concentration of studies in Europe and the United States of America (USA), there exists an outstanding opportunity and necessity to research more extensively into this subject within Latin America and the Caribbean, where institutions are uniquely positioned to offer invaluable standpoints and explanations to tackle regional challenges. Thus, an issue that should be of concern to researchers in this region is to understand better the development of their economies and the migration of qualified personnel. These concerns can be a fundamental topic for shaping strategies that advance economic growth while addressing the specific challenges in this region.

On the other hand, studies on migration and financial markets were carried out in 36 countries. Figure 4a,b show the most influential contributors to this concern. The USA leads this research arena with 21 studies and 276 citations. This may be a consequence of the fact that the headquarters of the World Bank is in the USA, and it has raised consolidated research teams with wide-ranging partnerships that allow them to commit to conveying resources and knowledge, creating international awareness of the topic's implication, throughout social-economic crises, and successfully networking within the academic community. These aspects have collectively driven to the forefront, accentuating the quantity and quality of research output. This underscores a proactive stance in maintaining a leading position in discussions concerning migration and financial markets, thereby influencing policy considerations. Also, the USA has one of the most significant transnational migration processes in history, which is of great interest to researchers in this field (Alfred 2010). Unlike the USA, China and the U.K. conduct more studies with researchers from other countries. The extreme cases are those of Spain, Germany, India, Nigeria, Poland, Romania, and Ukraine, which do not report collaboration with researchers from other countries.



(**a**)



(**b**)

Figure 4. Leading countries that published studies on the migration and financial markets arena: (**a**) corresponding authors' countries and (**b**) most cited countries. Note: USA data contain the World Bank. Source: Authors' own analysis using Bibliometrix with the WoS and Scopus databases.

3.2. Most Relevant Studies

Addressing RQ 2, Table 2 illustrates the most cited studies, highlighting specific research papers that have attracted considerable attention and citations from other scholars in the field. These highly cited studies typically denote seminal or pioneering works that have notably influenced migration and discourse in financial markets. The studies identified in Table 2 have collectively analyzed this relationship across various regions and periods.

Table 2. Top 10 globally cited studies in migration and financial markets research. Source: Authors' own analysis using Bibliometrix with the WoS and Scopus databases.

	Author	Study	Source	Total Citations	Citations Per Year
1	B. G. Mundaca (2009)	Remittances, Financial Market Development, and Economic Growth: The case of Latin America and the Caribbean	*Review of Development Economics*	146	9.13
2	Naudé et al. (2017)	Migration, Entrepreneurship and Development: Critical Questions	*IZA Journal of Development and Migration*	87	10.88
3	Baldé (2011)	The Impact of Remittances and Foreign Aid on Savings/Investment in Sub-Saharan Africa	*African Development Review*	60	4.29
4	Claessens et al. (2006)	Stock Market Development and Internationalization: Do Economic Fundamentals Spur Both Similarly?	*Journal of Empirical Finance*	58	3.05
5	Li et al. (2017)	Spatiotemporal Analysis of Housing Prices in China: A Big Data Perspective	*Applied Spatial Analysis and Policy*	53	6.63
6	Jonsson (2009)	Refraining from Imitation: Professional Resistance and limited Diffusion in a Financial Market	*Organization Science*	51	3.19
7	Crépey et al. (2014)	Counterparty Risk and Funding: A Tale of Two Puzzles	*Routledge*	48	4.36
8	Bosworth and Venhorst (2018)	Economic Linkages between Urban and Rural Regions—What's in it for the Rural?	*Regional Studies*	46	6.57
9	Chiodi et al. (2012)	Migration, Remittances, and Capital Accumulation: Evidence from Rural Mexico	*The Journal of Development Studies*	43	3.31
10	Green and Estes (2019)	Precarious Debut: Microfinance Subjects and Intergenerational Dependency in Cambodia	*Antipode*	39	6.50

These studies offer diverse perspectives on the complex interplay between migration and financial markets. B. G. Mundaca (2009) provides a clear theoretical framework and empirical evidence linking remittances and financial intermediation to economic growth. Their analysis is focused on a specific region (Latin America and the Caribbean), and thus

the findings may not be generalizable to all contexts. Additionally, it does not explore the potential downsides of financial intermediation on micro-entrepreneurs, such as high fees. The study conducted by Naudé et al. (2017) challenges the assumption that migrants are inherently entrepreneurial and highlights the importance of policy changes that address discriminatory barriers to accessing financial markets. In this way, it might understate the contribution of migrant entrepreneurship in specific contexts. Further research is needed to understand the conditions enabling their success.

On the other hand, Baldé (2011) fills a gap by analyzing the impact of remittances on savings and investment in sub-Saharan Africa. It offers valuable insights into the effectiveness of remittances compared with foreign aid. However, the research period might not capture the most recent trends in migration and remittance patterns. Additionally, the analysis could benefit from exploring the socio-economic factors influencing how remittances are used. Li et al. (2017) highlight big data analytics' potential for understanding the relationship among migration patterns, urbanization, and real estate fluctuations. This approach offers valuable insights for urban planning and policymaking. Their study focuses on a single case study (China) and may not be universally applicable. Furthermore, it does not explore the social implications of migration-driven housing price changes. Green (2020) and Green and Estes (2019) offer a critical perspective on microfinance, particularly in Cambodia. They expose the potential downsides of neoliberal reforms and highlight the role of local state regulation in shaping household debt and migration patterns. The ethnographic focus on a single country might limit the generalizability of their findings. Further research is also needed to explore how these dynamics play out in other microfinance contexts. Daveri (1999) highlights migration as a risk-management strategy. Likewise, this study suggests that in regions with malfunctioning financial markets, individuals facing uncertain income prospects may choose migration (internal or international) to mitigate risk. This underscores the potential role of financial inclusion in influencing migration patterns.

3.3. Most Cited Researchers

In response to RQ 5, Table 3 shows the top ten most cited researchers in the intersection of migration and financial markets, along with their affiliations and relevant details sourced from Marín-Rodríguez et al. (2023). The researchers are ranked in descending order according to their total citations in this field (TCT), providing valuable information about the most influential contributors to the study of migration and financial markets.

This table illustrates the progression of scholarly engagement with the intersection of migration and financial markets, with researchers spanning different eras contributing to the cumulative knowledge and understanding of this dynamic field. For example, researchers with earlier publication start years (e.g., Stijn Claessens 1988) have amassed substantial total global citations (TGCs), indicating foundational work in this area over several decades. Additionally, recent entrants (e.g., Vera Chiodi 2011) show emerging interest and contributions to the topic, although with fewer publications and citations.

Analyzing the researcher holding the top position in Table 3, Gabriela Mundaca from the University of Delaware (United States) emerges as a notable figure in the study of migration and financial markets. With an h-index of 7 and a substantial total global citation count (TGC) of 404, Mundaca's contributions have garnered significant attention within the broader academic community. Her specialization in this field is evidenced by a total citation in the topic (TCT) of 182 (B. G. Mundaca 2009), showcasing a focused impact specifically within the domain of migration and financial markets. Then, in the most cited study, B. G. Mundaca (2009) examines the relationship between remittances, financial market development, and economic growth in Latin America and the Caribbean. The results reveal that remittances can positively influence long-run economic growth, especially when coupled with improved financial intermediation. The research highlights the interconnectedness of financial markets and migration-related economic activities, providing valuable insights for policymakers.

Table 3. Top ten researchers with the highest citation counts in the migration and financial markets field. TGCs: total global citations; TCT: total citations in the topic; NPs: number of publications; PY start: publication year start. Source: Authors' own analysis using Bibliometrix with the WoS and Scopus databases.

#	Researcher	Institution (Country)	h_Index	TGC	TCT	NP	PY_Start
1	Gabriela Mundaca	University of Delaware (United States)	7	404	182	15	1998
2	Wim A. Naude	Cork University Business School—CUBS (Ireland)	27	3.580	87	120	1992
3	Siegel, Melissa	United Nations University–Maastricht Economic and Social Research Institute on Innovation and Technology (Netherlands)	13	526	87	46	2007
4	Stijn Claessens	Bank for International Settlements (Switzerland)	49	15.555	58	139	1988
5	Sergio L. Schmukler	The World Bank (United States)	29	3.259	58	67	1999
6	Vera Chiodi	Sorbonne Université (France)	2	71	55	4	2011
7	Esteban Jaimovich	University of Surrey (United Kingdom)	8	168	55	11	2010
8	Gabriel Montes-Rojas	Universidad de Buenos Aires (Argentina)	18	1173	55	98	2005
9	Gary Bosworth	University of Northumbria (United Kingdom)	24	1.828	46	52	2008
10	Viktor Andreas Venhorst	Rijksuniversiteit Groningen (Netherlands)	9	481	46	22	2010

The studies of Mundaca collectively contribute to advancing knowledge in the fields of migration, financial markets, and sustainability by addressing critical issues and providing evidence-based insights for policymakers and researchers alike. Her publications collectively contribute to understanding how financial policies, such as subsidy reforms, financial intermediation, and remittance dynamics, intersect with migration and economic development. They underscore the importance of incorporating local preferences and economic impacts into financial strategies and policies to foster sustainable economic growth in diverse regions.

3.4. Historiographic Map

In this study on migration and financial markets, the historiographic map serves as a visual tool to illustrate the chronological connections and evolution of scholarly works within the field. Developed by Garfield (2004), this method allows for analyzing temporal dynamics and interrelationships among seminal works. Historiography maps demonstrate the flow of ideas across studies, exemplified in our analysis by two distinct clusters represented in red and blue, respectively (Figure 5).

The red cluster in the map draws on seminal works by B. G. Mundaca (2009), Baldé (2011), Chiodi et al. (2012), and others and highlights key themes and chronological connections within this scholarly domain. Mundaca's research contributes insights into the positive long-run effects of remittances on economic growth, emphasizing the role of financial intermediation in optimizing their impact in Latin America and the Caribbean. Baldé's work challenges conventional views by demonstrating the significant contribution of remittances to savings and investment in Sub-Saharan Africa, surpassing the impact of foreign aid. Chiodi's analysis underscores migration as a strategy to mitigate financial market imperfections and promote productive asset accumulation among rural households in Mexico. Together, these studies reveal a nuanced historiography, depicting how ideas around migration, remittances, and financial development have evolved, shedding light on the complex dynamics and implications for economic growth and development. The

historiographical map serves as a valuable tool for understanding the temporal dynamics and interconnectedness of scholarly influence within this field, offering insights into the historical evolution of ideas and research directions in migration and financial markets.

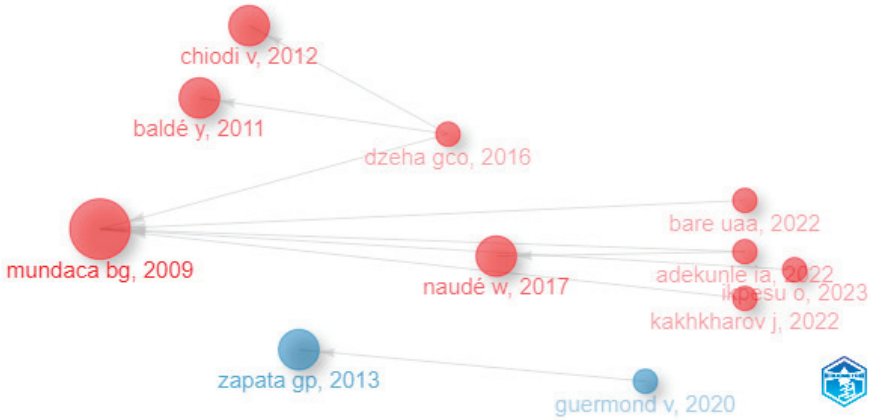


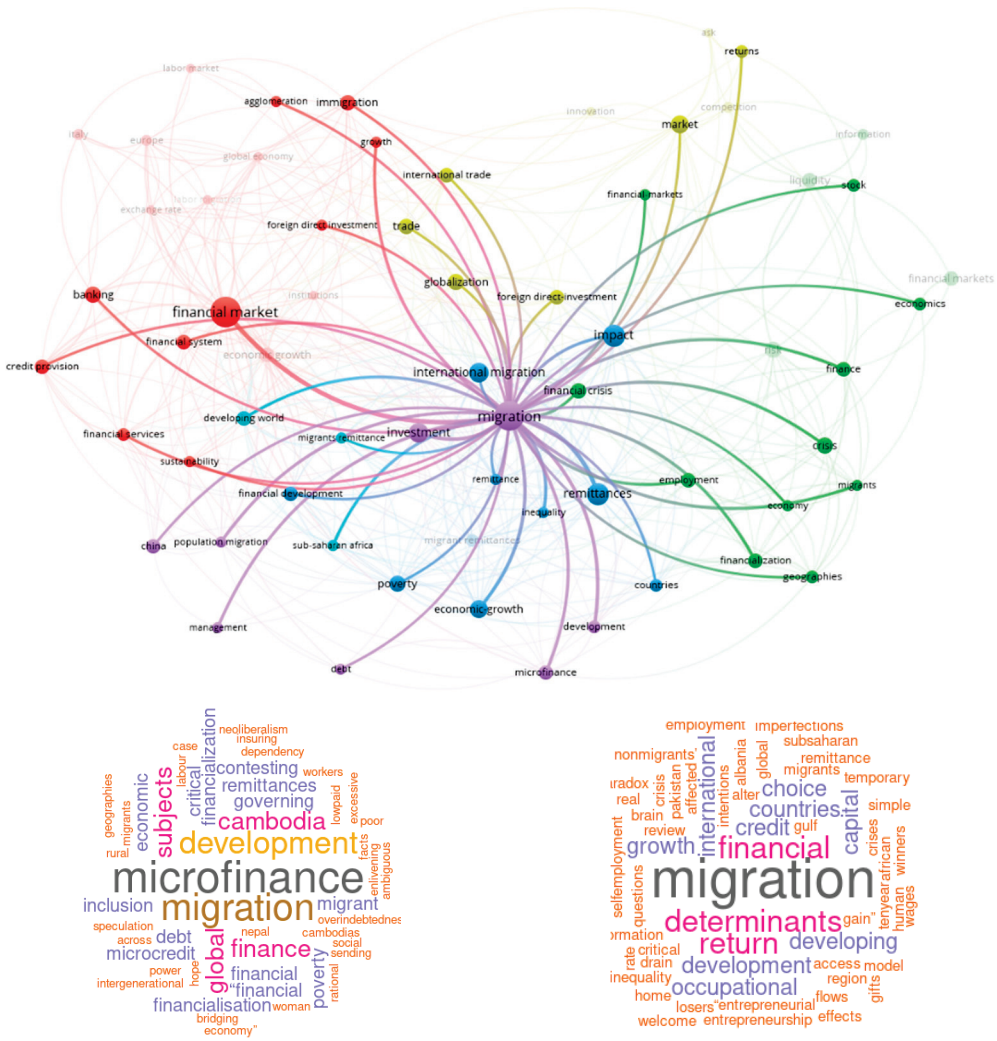
Figure 5. Historiographic map based on B. G. Mundaca (2009), Baldé (2011), Chiodi et al. (2012), Dzeha (2016), Naudé et al. (2017), Zapata (2013), Guermond (2020), Ali Bare et al. (2022), Adekunle et al. (2022), Ikpesu (2023), Kakhkharov et al. (2022). Source: Authors' own analysis using Bibliometrix with the WoS and Scopus databases.

Finally, the blue cluster involves the studies conducted by Zapata (2013), who contributes to this discourse by examining how migrants are reconceptualized as "transnational financial subjects," emphasizing their incorporation into the global financial system. The study explores efforts by the Colombian government to channel remittances into housing and finance while highlighting migrant households' strategies for transnational housing access. The study also argues that this conceptualization of migrants as financial subjects is pivotal for understanding the contemporary migration–development nexus, revealing tensions between state-driven financial initiatives and migrant households' agencies in shaping their economic actions. On the other hand, Guermond (2020) further extends this discussion by analyzing the marketization and financialization of remittances in Senegal. The study examines how various actors, including institutions and commercial entities, utilize remittances to integrate the unbanked and underbanked into global finance. The study underscores the complexities behind constructing remittance markets, emphasizing the role of geography and the contestation inherent in market-building processes. The article reveals how expanding remittance markets requires multifaceted efforts involving financial, technological, and discursive strategies, ultimately shaping capital accumulation practices and market formations.

Together, these studies illuminate the transformative dynamics of remittances within the global financial system, emphasizing the agency of migrant households and the challenges posed by neoliberal financialization agendas. They highlight the contested nature of remittance marketization, shedding light on the intricate processes that underpin efforts to integrate remittances into broader circuits of capital and finance.

3.5. Keywords Analysis

Regarding the research trends and addressing RQ 5, the keywords revealed two research trends in the knowledge frontier. The upper section in Figure 6 indicates the connections among key studies on migration and financial markets, while the lower section illustrates the two identified research trends. As mentioned, the relationship between migration and financial markets is broad and includes different topics, such as remittances, poverty, economic growth, and globalization. The trends are shown at the bottom of Figure 6.



Trend 1 **Trend 2**

Figure 6. Productivity of the researchers studying the migration and financial markets arena. Source: Authors' own analysis using Bibliometrix with the WoS and Scopus databases.

In the first trend analyzed, studies conducted on microfinance and remittances play a pivotal role. In one of the most prominent studies on this trend, B. G. Mundaca (2009) contributes to a better understanding of the relationship between migration, financial inclusion, and microfinance through the lens of economic growth. Thus, the study employed panel data from Latin America and the Caribbean to analyze the impact of remittances and financial intermediation on economic growth. The research highlights the potential role of financial markets in enhancing the positive effects of remittances on growth. On the other hand, Bylander (2023) analyzed pre-departure migration loans from a critical perspective. While proponents view them as empowering migrants and reducing risks, the studies expose potential downsides. Concerns include the systemic precarity of migrant labor, the risk of debt-driven exploitation, and how formal debt can increase vulnerability. Also, the study argues that migration loans can turn migrant experiences into profit opportunities for microfinance institutions. Bakker (2015) sheds light on the historical shift in perceptions of remittances. While traditionally seen as a social phenomenon, they are increasingly viewed as a development driver in sending countries. However, this shift necessitates a deeper understanding of the mechanisms and power dynamics underlying the remittance development narrative.

Likewise, Ambrosius et al. (2014) highlight the importance of context by understanding the relationship between remittances and microfinance. Their study compares three

Latin American countries, namely, the Dominican Republic, El Salvador, and Mexico, with high remittance dependence. Despite similarities, the research finds significant variations in the structure of remittance markets, the actors involved in microfinance, and the role of government. This underscores the need for country-specific analyses to identify the most effective ways for microfinance institutions to leverage remittances for financial inclusion and improve efficiencies in financial markets.

Finally, a study conducted by Bylander (2014) explores the concept of migra-loans, which could be defined as microcredits used alongside migration strategies. The research finds that these loans allowed households to meet immediate needs while pursuing international migration, potentially as a way to escape insecure local livelihoods. This highlights how microcredit interacts with migration patterns, challenging assumptions about its developmental potential and how financial markets can drive such development. All these challenge the financial inclusion narrative for migrants based on financial markets. These studies demonstrate a shift toward a better understanding of migration, financial inclusion, microfinance, and financial markets. Researchers are increasingly critical of simplistic narratives and are exploring the potential downsides of financial products like migration loans. Additionally, the importance of context and the need for country-specific analyses are becoming more evident. Further research can build on these topics. The second trend is characterized by determinants, return, economic flows, and stock markets. The studies on this trend showcase several intriguing research directions in the field of migration and its interaction with different topics. Osili and Paulson (2004) explore the impact of migrants' home country institutions on their financial behavior in the host country. It argues that immigrants from countries with strong property rights protection are more likely to participate in the host country's financial markets. This emphasizes the enduring influence of early experiences on financial decision-making. Yang (2006) examines the factors influencing the return migration decisions of Filipino workers. It distinguishes between "target earnings" (returning to a specific financial goal) and "life cycle" motivations (returning at a particular stage in life). The research suggests that life cycle considerations might be more significant, with favorable exchange rates leading to fewer returns. This highlights the complex decision-making processes behind migration patterns.

On the other hand, Kushnirovich (2016) delves into the financial behavior of immigrants compared to native-born investors. The study utilizes Bourdieu's concept of economic habitus to explain how cultural, economic, and social capital influence financial decision-making. The research finds that cultural background plays a more substantial role for low-income immigrants, while economic capital and social class become more important for high-income ones. This highlights the multifaceted nature of migrant financial integration. Employing a novel approach, Baker and Blau (2019) examine how immigration impacts firms' stock prices that are likely to be affected by immigration. Their study focuses on the temporary protected status program in the U.S., suggesting a potential positive impact on firms. This opens doors for further research on the broader relationship between immigration and financial markets. Finally, Bossavie et al. (2024) conduct temporary migration to overcome credit constraints and facilitate entrepreneurship upon return. Using data from Bangladesh, their study finds that returning migrants are likelier to become non-agricultural entrepreneurs, primarily funded by savings accumulated abroad. This highlights the potential of migration to promote economic transformation in sending countries.

All these studies and their mentioned trends reveal a growing diversity in research on migration and financial markets. Researchers are moving beyond the traditional focus on labor market impacts to explore how migration interacts with financial inclusion, entrepreneurship, firm performance, and even the global architecture of financial markets.

The keyword analysis findings highlight how financial dynamics influence migration patterns rather than solely focusing on how migration impacts financial markets. This shift in perspective has significant implications. It suggests that financial markets and products, such as microfinance and remittances, are crucial in shaping migration decisions

and outcomes. For instance, the availability and terms of migration loans can determine whether individuals choose to migrate and under what conditions. At the same time, financial inclusion initiatives can impact the economic opportunities available to migrants. This broader understanding underscores the need for policies that consider how financial mechanisms can empower or exploit migrants, highlighting the importance of designing inclusive financial systems that support positive migration outcomes. By recognizing the bidirectional relationship between finance and migration, researchers and policymakers can develop more holistic strategies that address economic growth and migrant welfare.

3.6. Topics with High Development and Relevance

Based on the keywords of studies published on migration and financial markets, and aiming to respond to RQs 2, 3, and 4, Figure 7 presents a thematic map analysis in which several themes are categorized. This approach categorizes the research into four quadrants based on the topic's density and centrality within the field. These quadrants are plotted on a two-dimensional graph, with centrality (indicating the topic's importance) on one axis and density (measuring the topic's development) on the other (Zhang et al. 2022). Building on the goals of scientometric mapping, this analysis aims to reveal the intellectual, conceptual, and social structure of specific disciplines, scientific domains, or research fields.

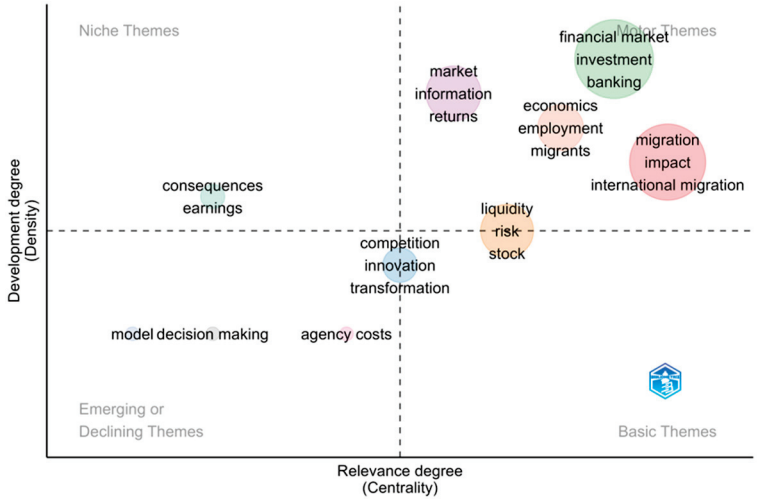


Figure 7. Thematic map. Source: Authors' own analysis using Bibliometrix with the WoS and Scopus databases.

Motor Themes (quadrant I), located on the upper right side, are related to those topics that have relevance, significance, and development in the migration and financial market arena. In this way, it is suggested that these topics have developed and formed central supports that outline the research fields (Zhang et al. 2022). In this case, subjects related to employment, market information, returns, financial inclusion, and investment banking have special attention in the research field. Although liquidity, risk, and stock are in this theme, they need more attention from researchers to become trending topics. Based on these findings, they are still not fully established, which shows an opportunity for further research.

Niche Themes (quadrant II), in the upper left quadrant, include powerfully developed but isolated subjects. In this way, the consequences of earnings need to be articulated with others to continue contributing to migration and financial market development. For example, studies on how migrants can profit from financial markets by investing in local stocks can help expand the knowledge frontier.

On the other side, unlike the topics in quadrant II, the importance of Emerging Themes (quadrant III) over time has been falling among researchers, or the topics have been weakly developed and peripheral. This does not indicate that they are not relevant. Thus, this

study suggests that decision-making and agency cost prevalence can be addressed from different perspectives to be more relevant.

Finally, Basic Themes (quadrant IV) include peripheral subjects that, unfortunately, have been underestimated but have a high likelihood of development. For example, liquidity, risk, and stock, which are also in the Motor Themes, are prominent subjects that need more attention for researchers to become trending topics, as mentioned above.

In summary, the thematic map analysis presented in Figure 7 is a valuable roadmap for further research endeavors. By analyzing quadrants with high centrality (important topics) and high density (well-developed topics with room for further exploration), the findings guide researchers toward the most promising avenues for advancing knowledge. These areas offer a solid foundation and the potential for significant breakthroughs within this field.

4. Discussion

Achieving the SDGs requires the establishment of banking and financial frameworks that incorporate a broader array of socially oriented products. Therefore, incorporating these considerations into the formulation of public policies and as a central tenet of private sector strategies will yield tangible outcomes in pursuing the SDGs.

In addition, Figure 8 depicts the interactive relationships between migration and financial markets through branches. Each branch delves deeper into a specific facet of this complex interplay. These are explained below:

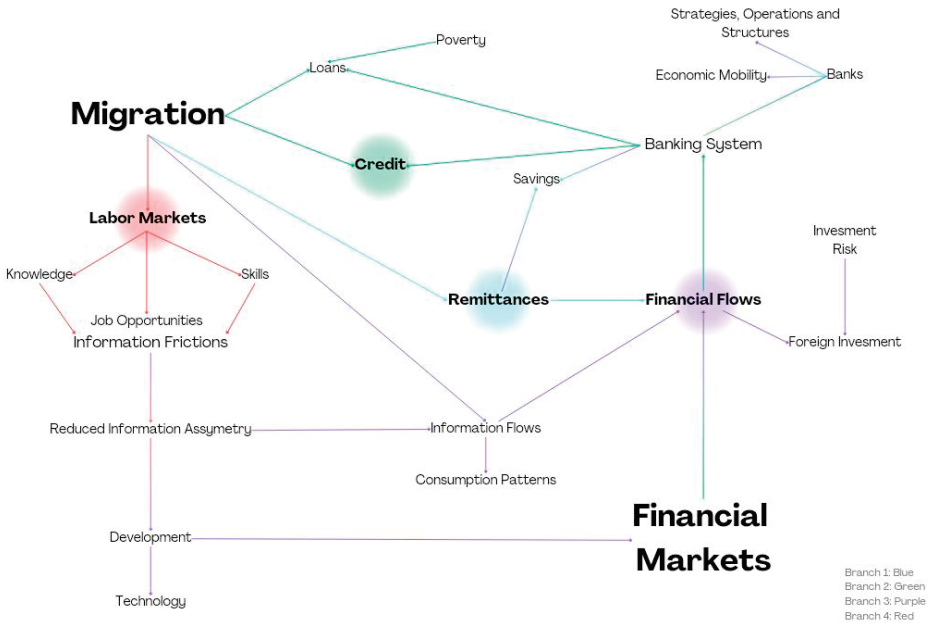


Figure 8. Mental map of the interactive relationship between migration and financial markets. Source: Authors' own interpretation based on the findings.

4.1. Remittances

Leading studies conducted by B. G. Mundaca (2009) shed on how remittances can positively influence long-run economic growth. This influence is evidenced by several mechanisms including the following: (a) remittances can act as a pivotal source of investment capital, fostering the development of domestic financial markets and (b) increased remittance flows can incentivize the banking sector to adapt its services and outreach strategies to better serve a broader customer base, particularly in underserved regions.

4.2. Access to Credit

Following the financial market branch of the mind map, specifically on the banking system, we encounter the work of Katsaiti and Khraiche (2023). Their research establishes

an inverse relationship between credit access and migration probability. This finding underscores the impact of financial inclusion on migration patterns. When individuals have access to credit in their home countries, they may be less likely to seek migration opportunities abroad to finance their goals. In this regard, banks have a pivotal responsibility to enhance financial accessibility, actively fostering the development of socioeconomic conditions, particularly in developing countries.

4.3. Financial Flows

Helms and Leblang (2019) and Kugler et al. (2018) highlight the pivotal role migrants play in shaping investment patterns. Migrants act as facilitators, fostering international connections among source countries, investors, and destination countries. This role can be attributed to several factors. On the one hand, migrants often hold solid social connections with their home countries, facilitating the flow of information and fostering trust between potential investors and local businesses. On the other hand, migrants influence a unique understanding of their origin and destination cultures, which can bridge cultural gaps and mitigate potential investment risks. Meanwhile, these finance flows integrate with financial institutions, such as banks, and a strategic response needs to be established from these institutions, prompting them to re-evaluate their existing business models, organizational structures, and operational procedures.

4.4. Labor Migration

Labor migration facilitates the transfer of skilled workers and knowledge among countries. In fact, skilled migrants in a new location can alleviate information asymmetry, where one party in a transaction lacks complete knowledge. This improved information flow can enhance investment efficiency and stimulate economic growth. Moreover, skilled labor can foster innovation and accelerate productivity growth in the host country.

By better understanding the complex relationship between migration and financial markets through this mind map (Figure 8), this study contributes to a deeper understanding of how these phenomena interact and influence each other. This knowledge can inform the development of targeted economic policies that leverage the positive aspects of migration while mitigating potential risks. Furthermore, it can signal the potential risks and strategies that these interactions could cause.

5. Conclusions

This study presents an in-depth scientometric analysis that delves into the forefront of research on the relationship between migration and financial markets. The focus on recent trends and unexplored avenues has provided us with a comprehensive understanding of the evolution of research in this field from 1988 to March 2024. A meticulous assessment of 157 studies from the Scopus and Web of Science databases was conducted to support the findings, as RQ 1 established. Thus, by providing insights into the current landscape of these relationships, this study contributes to a comprehensive appreciation of the field's evolution and offers pointers toward potential trajectories.

The findings reveal that the top 10 globally cited studies provide significant insights into the relationship between migration and financial markets. B. G. Mundaca (2009) offers a theoretical framework linking remittances, financial market development, and economic growth in Latin America and the Caribbean. Naudé et al. (2017) challenge assumptions about migrant entrepreneurship and highlight policy changes needed for accessing financial markets. Baldé (2011) analyzes the impact of remittances and foreign aid in Sub-Saharan Africa, while Claessens et al. (2006) examine stock market development and internationalization. Li et al. (2017) provide insights into housing prices in China using big data. Jonsson (2009) explores professional resistance in financial markets, while Crépey et al. (2014) analyze counterparty risk. Bosworth and Venhorst (2018) investigate economic linkages between urban and rural regions, and Chiodi et al. (2012) examine migration and capital accumulation in rural Mexico. Green and Estes (2019) offer a critical perspective on

microfinance in Cambodia. These studies collectively contribute diverse perspectives on migration and financial market dynamics, as RQ 2 established.

As the landscape of migration and financial markets continues to evolve with pronounced economic and social dimensions, the insights from this study provide a road map to traverse and contribute to this shifting terrain. Importantly, leading scientometric tools set a precedent for further research exploring the intricate interplay with social and economic concerns, as RQ 3 established. Two key trends emerge from prominent migration and financial market studies. Firstly, empirical analyses and holistic approaches integrating perspectives from various disciplines demonstrate a trend toward establishing a solid theoretical foundation. Secondly, diverse methodologies are employed, including econometric models that frame approaches, revealing insights into the complex relationship between migration and financial markets. These trends indicate ongoing development in this field's theoretical frameworks and methodological approaches.

Thus, although the findings had some correlation with the SDGs, we would like to highlight that the intersection of migration and financial markets carries significant implications for achieving them. Migration patterns, driven by economic disparities and geopolitical factors, influence financial markets through various channels, including remittances, investment flows, and labor market dynamics.

For example, Sustainable Development Goal 10 (Reduced Inequalities) directly addresses the challenges migrants face, advocating for policies that ensure their rights, safety, and well-being. Financial inclusion, a key aspect of SDG 10, intersects with migration as it promotes access to banking services and capital for migrants, fostering economic empowerment and resilience. Moreover, migration can contribute to SDG 8 (Decent Work and Economic Growth) by supplying labor to fill skill gaps and stimulate economic activity. However, disparities in access to financial services and employment opportunities among migrants can exacerbate inequalities, hindering progress toward multiple SDGs, including poverty eradication (SDG 1) and quality education (SDG 4). Thus, understanding the intricate relationship between migration and financial markets is imperative for crafting inclusive policies that advance the SDGs, as RQ 4 established.

The results of the most significant migration and financial markets researchers, as RQ 4 established, reveal that Mundaca's studies collectively contribute to advancing knowledge in migration, financial markets, and sustainability, addressing critical issues and providing evidence-based insights for policymakers and researchers. For instance, her work analyzes the impact of fossil fuel subsidy reforms on economic growth in MENA countries (G. Mundaca 2017), highlighting the economic consequences and potential for growth resulting from subsidy reforms. Additionally, her research on the economic valuation of environmental and health impacts from mining activities underscores the importance of considering local preferences in financial and development policies (G. Mundaca 2022).

Other significant researchers include Wim A. Naude, Melissa Siegel, Stijn Claessens, Sergio L. Schmukler, and others. These scholars have made substantial contributions spanning different eras, contributing to the cumulative knowledge and understanding of migration and financial markets. Their works reflect a progression of scholarly engagement with this dynamic field, from foundational studies to emerging research interests.

The findings from our comprehensive scientometric analysis underscore the critical need for policymakers to enhance financial inclusion for migrants, addressing both economic empowerment and social equity. Firstly, it is crucial to ensure migrants have easy access to banking services and tailored financial products. Simplifying documentation requirements and promoting mobile banking solutions can enhance accessibility (Ayadi et al. 2021; Katsaiti and Khraiche 2023; Fernández-Romero et al. 2024). Secondly, investing in financial literacy programs, including integration initiatives, is essential to empower migrants in financial decision-making.

Moreover, efforts should be made to facilitate low-cost remittance flows and promote transparency in fees and exchange rates (Sobiech 2019; B. G. Mundaca 2009). Crafting inclusive financial policies, fostering partnerships between public and private sectors,

and innovating with technology are vital steps toward financial inclusion. Additionally, addressing gender-specific needs and leveraging social networks can further enhance migrants' financial integration.

Lastly, establishing robust monitoring and evaluation mechanisms is necessary to assess the impact of these policies. By following these recommendations, policymakers can create a more inclusive financial environment for migrants, aligning with SDGs and fostering economic empowerment and social equity.

Finally, incorporating broader aspects such as brain drain, human capital, wages, and entrepreneurship is crucial for a comprehensive understanding of the interplay between migration and financial markets. Addressing brain drain is essential, as the emigration of skilled individuals can deplete the source country's human capital, impacting economic development and innovation. Additionally, human capital investments by migrants, through education and skills, enhance productivity and economic growth in host countries while supporting education and health in sending countries through remittances. Migration also significantly influences wage levels in both sending and receiving countries, affecting labor markets and economic stability. Furthermore, migrant entrepreneurship drives innovation, job creation, and economic activity, highlighting the need to foster supportive environments for entrepreneurial endeavors. Incorporating these aspects will provide deeper insights for policymakers and researchers, enabling well-rounded strategies to enhance the benefits of migration while mitigating its challenges.

In conclusion, drawing from the trends and findings of this study, further research should explore the gendered dynamics of remittances and microfinance access, the role of social networks in financial decision-making, and how financial markets can be better designed to promote financial inclusion for migrants and their families. By addressing these topics, we can develop more nuanced policies that harness the potential of migration and financial tools while mitigating potential risks.

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The Determinants and Growth Effects of Foreign Direct Investment: A Comparative Study

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Abstract: This study examines the factors determining inward foreign direct investment (FDI) and its effects on productivity, ultimately contributing to economic growth. Using a two-step generalized method of moments (GMM) approach, we analyzed a panel of 84 countries, comprising 34 OECD and 50 non-OECD countries, from 2010 to 2019. The findings suggest that FDI positively impacts productivity and benefits both OECD and non-OECD countries. Economic freedom plays a significant role in attracting FDI, particularly in OECD countries, and contributes to economic growth in non-OECD countries. However, economic freedom alone does not guarantee strong economic growth in OECD countries but significantly enhances growth in non-OECD countries. The results also highlight that only economies with robust economic infrastructure and development levels benefit more from FDI. It appears that FDI by itself has no direct effect on output growth. Instead, the impact of FDI is contingent on the level of economic freedom in the host countries. This paper presents a key finding on how policy decisions influence the effects of foreign capital investment on productivity and income. It indicates that countries promoting economic freedom can more effectively leverage productivity gains from FDI.

Keywords: economic freedom; economic growth; foreign direct investment; productivity spillovers; system GMM

JEL Classification: E23; F21; F43; O47

1. Introduction

Economic openness attracts foreign direct investment (FDI), which not only brings in capital but also transfers knowledge and technology to host countries that would not otherwise have access to it. As investment from other countries links FDI host countries to the global market, global value chains provide opportunities for the countries to diversify their exports and expedite their integration into the global economy, as noted by Dollar (2017) in his Brookings feature article.[1] Through global value chains, host countries are exposed to broader economic activities in widely separated locations that are interconnected. Local firms may benefit from substantial economies of scale, strengthening their competitive global market positions. The World Bank (2021) underscores the crucial role of policies that attract and facilitate FDI entry in enhancing investment promotion capacity. These policies lead to spillover effects through supply chain linkages, which bring new capital, technology, and knowledge into business practices, enabling local firms to better withstand the onslaught of global, scalable firms. Serpa and Krishnan (2018) indicate that firms interacting within a supply chain affect each other's productivity, and productivity spillovers are more pronounced when the supply chain is more concentrated. Thus, countries that gain from productivity improvements accrued from FDI inflow are more likely to pursue policies favoring economic openness.

Productivity spillovers from multinational activities to local firms come with knowledge and technology to an extent that is non-excludable and non-rival in production.

Blomström and Kokko (1998) identify three main channels where productivity spillovers occur from FDI inflows to host countries, including demonstration effects through the imitation of newer technologies, competition effects through competitive pressure, forcing local firms to improve their production efficiency, and knowledge spillover effects through skilled labor mobility. Developing countries tend to attract a sizeable share of FDI through comparative advantage mechanisms and more substantial capabilities to pursue economic growth. For these countries to achieve productivity spillover gains, FDI inflows need to be stable and complementary to the labor force structure within the local economy, where FDI inflows would bring the capital formation to an extent sufficient to absorb the growth in the labor force, adjusting labor and capital to the equilibrium where productivity spillover effects can be prevalent. Consequently, countries that better capture the effect of demonstration or contagion are more likely to benefit from FDI inflows.

One aspect of low wages in developing countries can be attributed to the lack of productive capital, which is the primary factor driving structural unemployment. For wages in these countries to rise, capital investments need to be sufficient to reach the steady state growth rate of labor supply to boost labor productivity, and FDI can be a source for capital investment to expand to the level where productivity will grow, rendering in terms of skill development and productivity spillover. Consequently, many developing countries turn to FDI attraction, seeking foreign capital to mitigate capital constraints and fill the resource gap in their quest for economic development. In their empirical studies, Lipsey and Sjöholm (2004), and Hijzen et al. (2013) put forth a view that multinational corporations (MNCs) tend to offer wage premia compared to their domestic counterparts with which the gap between wages in local firms and MNCs forces domestic firms to face competitive pressure in the labor markets for higher wages. MNCs share knowledge or technology with their suppliers, which they then implement to increase productivity. In return, MNCs would demand higher-quality goods and resources from suppliers, forcing local firms to be more productive. Thus, productivity spillovers occur as FDI creates benefits that local suppliers and other firms share in the local markets.

This study examines the potential of FDI inflows to promote economic growth across countries at various stages of development. We specifically investigate the ways in which FDI contributes to economic growth through productivity enhancements and assess the influence of economic freedom on a country's ability to attract FDI. We emphasize that FDI's effects on productivity depend positively on labor market concentration in the host country and attempt to measure the effects of productivity by exploring the ratio of capital to the stock of labor efficiency rather than focusing on horizontal or vertical productivity spillovers, as is commonly done. From a macroeconomic perspective, our approach to the FDI effect on productivity allows us to examine the overall impact of FDI inflows for an economy rather than within a specific sector or the level of the economy where the viewpoints would be relatively segmented.

We apply the system generalized method of moments (GMM) approach proposed by Arellano and Bover (1995), and Blundell and Bond (1998) to estimate the impact of FDI inflows on economic growth through productivity spillover effects. Based on a panel of 84 countries from 2010 to 2019, the findings suggest that FDI positively impacts productivity and benefits both OECD and non-OECD countries. Economic freedom is pivotal in attracting FDI inflows, particularly in OECD countries, and contributes to economic growth in non-OECD countries. While economic freedom does not guarantee robust economic growth in OECD countries, it significantly enhances growth in non-OECD countries. However, only economies with strong infrastructure and high levels of development benefit more from FDI. FDI by itself has no direct effect on output growth. Instead, the impact of FDI is contingent on the level of economic freedom in the host countries.

This paper explores the factors that influence inward FDI and its positive effects on productivity. While many policies aim to attract foreign investment, the impact of FDI inflows on economic growth varies significantly depending on the specific circumstances of each country. We argue that nations promoting greater economic freedom are more capable

of harnessing the productivity benefits associated with FDI, ultimately enhancing their potential for sustained economic growth. Our study focuses on various groups of transition economies and OECD countries. A key conclusion of this paper is that policy decisions play a crucial role in shaping how foreign capital investment impacts productivity and income. Our findings suggest that countries encouraging economic freedom are more successful in leveraging the productivity gains from FDI.

The remaining sections of the paper are organized as follows. Section 2 provides an overview of the relevant literature. Section 3 describes the data and econometric methodology applied in the study. Section 4 presents a preliminary finding explaining why system GMM estimates are superior to difference GMM estimates in this study, followed by our empirical findings of the GMM estimates with interaction terms and data segmented into transition and OECD economies. The main findings are summarized with a concluding remark in the Section 5.

2. Literature Review

Despite their differing viewpoints, the neoclassical and endogenous growth models serve as foundational frameworks for much of the empirical research exploring the relationship between FDI and economic growth. The neoclassical growth model, particularly the Solow theory, posits that FDI enhances the capital stock and stimulates economic growth in the host country by promoting capital formation (Brems 1970). However, because of diminishing returns on capital, the influence of FDI on growth is comparable to that of domestic investment. In this framework, FDI plays a role in economic growth in the short term as countries transition toward a new steady state (Solow 1956).

Conversely, the endogenous growth theory asserts that FDI significantly drives economic growth through capital formation and technology transfer. As Romer (1994) noted, FDI enhances economic growth by facilitating technology transfer from developed nations to developing ones. Moreover, the training provided for the workforce and management improves knowledge and strengthens human capital. Consequently, the accumulation of human capital and technological advancements are vital factors influencing the spillover effects of FDI on the host country's economic growth (De Mello 1997, 1999). Ultimately, the endogenous growth model suggests that FDI may be more productive than domestic investment due to FDI's ability to integrate advanced technologies into the production processes of host economies. From this perspective, the technological spillovers associated with FDI can serve to alleviate the effects of diminishing returns to capital, thereby promoting sustained economic growth over the long term.[2] FDI appears to play a crucial role in fostering the economic growth of host countries.

While theoretical frameworks suggest a direct link between FDI inflows and economic growth, empirical studies provide inconsistent evidence regarding the impact of FDI on productivity. Blomström et al. (2003) argue that the advantages of FDI spillovers can only be fully realized when local firms possess the capacity and motivation to leverage foreign technologies and skills effectively. They emphasize that FDI alone does not ensure the transfer of these foreign technologies and skills to domestic industries. Numerous studies have yielded varied results to clarify the relationship between FDI and economic growth, prompting a series of meta-analyses to examine the effects of productivity spillovers associated with FDI. One such meta-analysis identified evidence of publication bias and concluded that the type of data employed—whether derived from industrial or plant-level sources, representative of developing or developed countries, or more recent—does not significantly influence the findings (Havránek and Iršová 2010). Demena and van Bergeijk (2017) investigate 1450 estimates from 69 empirical studies published in 1986–2013 and note the inconsistency of reported FDI spillover findings caused by publication bias, characteristics of data, and model misspecification.

Meyer and Sinani (2009) suggest that the relationship between a country's stage of economic development and the spillover effects of FDI appears to be curvilinear. Economies characterized by low and high levels of GDP per capita derive benefits from FDI spillovers;

however, transition economies situated in the intermediate range exhibit a decreasing influence. Wooster and Diebel (2010) also present weak evidence of horizontal spillovers in developing countries, contrasting prior studies. However, research examining spillovers to domestic firms in the same sector is relatively limited. Iršová and Havránek (2013) find similar results to Wooster and Diebel (2010) with no evidence of horizontal spillovers. They argued that past levels of FDI do not affect current spillovers, implying a linear effect, wherein a country saturated with FDI may still reap spillover benefits.

Empirical research utilizing data from specific countries offers compelling evidence that supports the relationship between FDI and economic growth. For instance, Asheghian (2004) and Salehizadeh (2005) confirmed a positive and significant relationship between FDI and economic growth in the United States. Kornecki and Raghavan (2011) noted that countries in Central and Eastern Europe view FDI as a crucial tool for developing and modernizing their economies. Additionally, several studies have shown that FDI inflows have a strong and positive effect on economic growth in China (Tian et al. 2004). Empirical analyses by Fang and Liu (2007), Sharahili and Liu (2008), and Omer and Yao (2011) found a bi-directional causality and long-term relationships between inward FDI and economic growth in both China and Malaysia.

The extant body of literature mainly supports the idea that FDI positively impacts economic growth, with productivity spillovers primarily seen as beneficial to domestic firms through the transfer of technology and knowledge from MNCs. Borensztein et al. (1998) test the effect of FDI on economic growth in a framework of cross-country regression and find that FDI is an important vehicle for the transfer of technology, contributing to growth in a larger measure than domestic investment. However, their empirical results also suggest that FDI is more productive only when the host country has a minimum threshold stock of human capital. Li and Liu (2005) investigate whether FDI affects economic growth based on a panel of data for 84 countries over the period 1970–99. They find that FDI directly promotes economic growth in developing countries and also contributes indirectly through its interaction with human capital. However, FDI combined with a technology gap has a significantly negative impact.

Amann and Virmani (2014) examine the feedback effect of FDI on productivity and find that the effect of FDI on enhancing productivity growth is more significant for R&D-intensive developed countries investing in emerging economies. Gorodnichenko et al. (2014) present evidence to partially support Blomström and Kokko (1998), suggesting that domestic firms experience a faster increase in efficiency after supplying to MNCs. However, domestic firms purchasing from or competing with MNCs in the same industry do not appear to gain positive spillovers. This could be due to the cost of implementing new technology to compete with MNCs in the short run. Based on a sample of 17,625 Chinese manufacturing firms, Liu (2008) shows that FDI spillovers lower domestic firms' productivity levels in the short run and that backward linkages are the most statistically significant channel for technology spillovers to occur, potentially due to the demand for high-quality goods supplied to MNCs by domestic firms. The result suggests that productivity spillovers from FDI are still positive and substantial overall.

Building on the channels by Blomström and Kokko (1998), Azman-Saini et al. (2010) examine 85 countries and generate evidence of productivity spillovers from FDI conditioning on high levels of economic freedom. They highlight how economic freedom and FDI jointly positively and significantly affect growth. However, FDI alone does not impact growth, concluding that this occurs because economic freedom facilitates FDI spillovers. Naanwaab and Diarrassouba (2016) also contend that economic freedom is a positive determinant of FDI but also note that this occurs only when economic freedom is sufficiently high, and the most critical components of economic freedom are legal structure and property rights, regulation, and freedom to trade. This is similar to Iamsiraroj and Ulubaşoğlu (2015) who find that financial development and trade openness are essential for a country to have the absorptive capacity for FDI to impact growth.[3] However, the effect subsides once the economic development and trade openness reach certain levels.

Sambharya and Rasheed (2015) posit that economic and political freedom affects countries' institutional environments, which can influence a firm's decisions to enter markets. Higher economic freedom overall leads to increased FDI inflows. However, only four out of five of the Heritage Foundation's economic freedom index components influence FDI inflows. The exception of trade and investment freedom contrasts with Azman-Saini et al. (2010), who find that freedom to trade is essential.

Naanwaab and Diarrassouba (2016) show that economic freedom alone cannot attract FDI inflows in developing countries; human capital and economic freedom are jointly substantial. Human capital is critical in enhancing absorptive capacity so domestic firms can maximize productivity spillovers by utilizing foreign knowledge and technology (Blomström et al. 2003). (Balasubramanyam et al. 1999) also find that for human capital to act as a conduit for FDI to affect growth, a threshold of human capital is necessary. Similarly, Bengoa and Sanchez-Robles (2003) argue that FDI positively correlates with economic growth conditioned upon adequate levels of human capital. Fukase (2010) infers that FDI affects growth through human capital differently depending on the channel, industry, and institutions. Wooster and Diebel (2010) note that labor quality is inversely associated with spillover absorption, where higher labor quality leads to decreased productivity spillover benefits from FDI. Kristjánsdóttir (2010) implies that MNCs are less attracted by human capital and labor education levels as they originate from highly skilled labor countries. The labor cost difference between countries was a more significant determinant of FDI, as MNCs are more likely to take advantage of cost-saving labor.

Restrictive labor laws could inhibit knowledge transfer between MNCs and domestic firms through the labor movement. Using data from Vietnam and China, (Vu et al. 2008) analyze the impact of FDI inflows on growth through labor in different economic sectors. They find that FDI inflows significantly and positively affect growth through indirect interaction with labor in both countries. However, the effect is not equally distributed among sectors. High levels of regulation could also impede the efficient allocation of resources, giving less opportunity for domestic firms to acquire funding to adopt new technologies; strong protection of property rights would entice more technology-oriented FDI to develop their R&D domestically; and freedom to trade would allow MNCs to export easily while producing goods at a lower cost in developing countries, creating competition and relationships with domestic firms in the process.

3. Data and Methodology

This study focuses on countries in distinct stages of economic development. In parts of the analysis, the distinction is made between OECD and non-OECD countries. A panel of 84 countries includes 34 OECD countries and 50 non-OECD countries over the 2010–2019 period. The variables included in the analysis are real GDP per capita, FDI inflows, economic freedom index, gross capital formation, population growth rate, labor force participation rate, and labor productivity. FDI inflows are the net inflow as a percentage of real GDP. Real GDP and gross capital formation are in constant 2015 US dollars. Labor productivity is output per employed person in constant 2015 US dollars. The population growth rate is the ratio between the annual increase in the population size and the total population. The labor force participation rate is the percentage of a country's working-age population actively engaged in the labor market. Economic freedom is an index measuring the degree of freedom in a country comprised of five major components: (1) size of government, (2) legal structure and security of property rights, (3) access to sound money, (4) exchange with foreigners, and (5) regulation of capital, labor, and business.

Real GDP and gross capital formation were drawn from the World Bank World Development Indicator. The data on FDI inflows were obtained from the United Nations Conference on Trade and Development data center (UNCTAD). Economic freedom is the index compiled by the Fraser Institute. Population growth rate is compiled by the World Health Organization (WHO). Labor productivity and labor force participation rates were obtained from the International Labor Organization Statistics Database (ILOSTAT). Table 1

reports summary statistics for GDP growth rate, FDI inflows, domestic capital formation in percentage of GDP, population growth rate, labor force participation rate, and labor productivity changes over the sample period based on the respective full sample, OECD, and non-OECD countries.[4] Non-OECD countries appear to have higher GDP and population growth rates than OECD countries, while average labor productivity in the former is notably lower than in the latter. In terms of GDP size, transition economies also receive approximately twice the FDI inflows as a percentage of GDP than OECD economies.

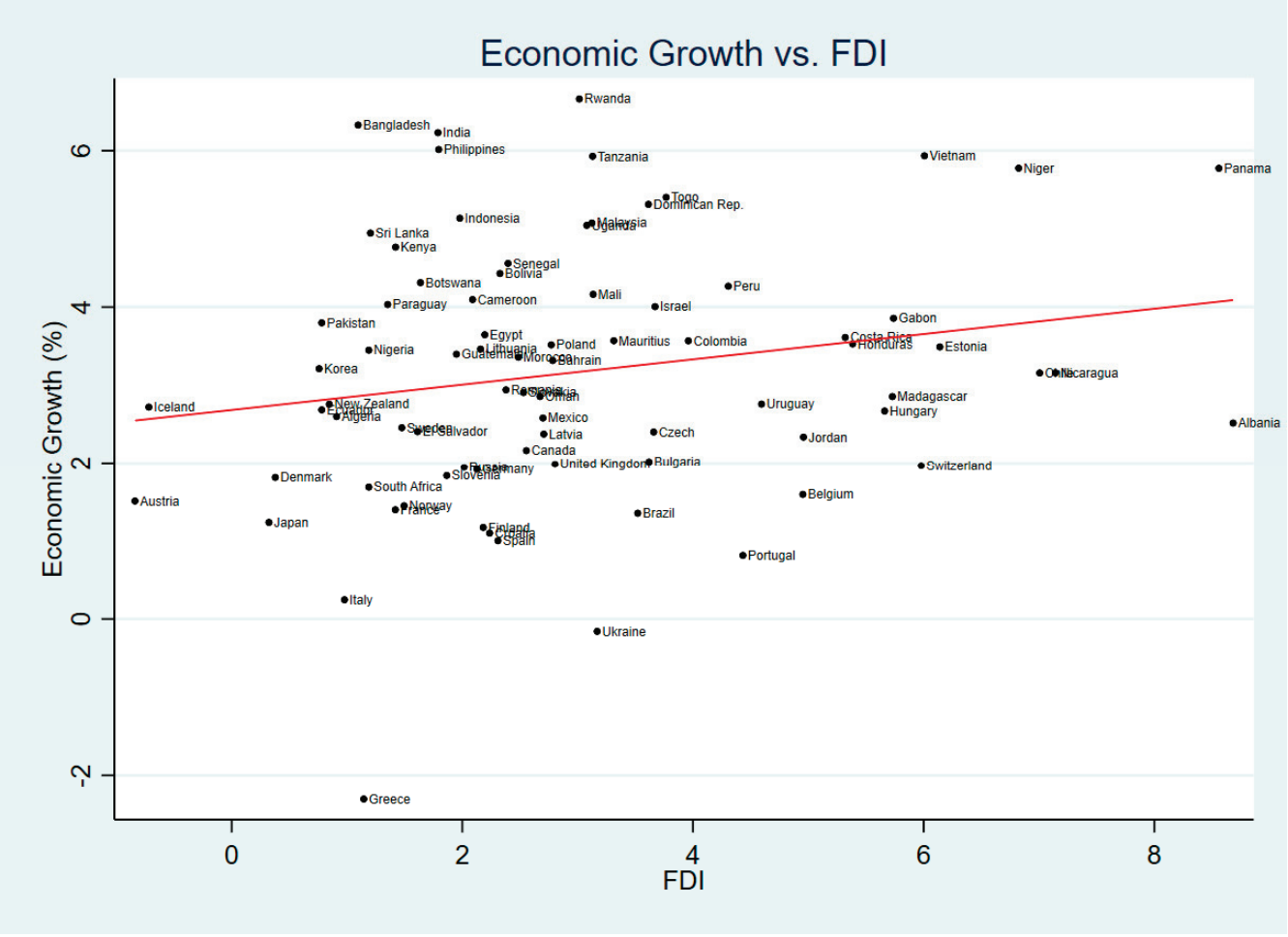
Table 1. Summary statistics for the period 2010–2019.

Variable	Mean	Std. Dev.	Minimum	Maximum
Full Sample				
GDP Growth (%)	3.14	2.66	−12.09	20.11
FDI (% of GDP)	5.46	18.70	−40.29	280.13
Economic Freedom	7.16	0.81	4.45	8.62
Capital Cumulation (% of GDP)	18.32	20.30	−263.56	71.16
Population Growth (%)	1.18	1.37	−1.319	12.25
Labor Force Participation Rate (%)	61.99	8.912	39.25	89.05
Labor Productivity	38,557.87	39,987.14	928.9	181,776
Non-OECD Countries				
GDP Growth (%)	3.75	2.72	−12.09	10.19
FDI (% of GDP)	6.64	22.87	−24.90	280.13
Economic Freedom	6.78	0.80	4.45	8.25
Capital Cumulation (% of GDP)	18.32	24.87	−263.56	71.16
Population Growth	1.65	1.50	−0.92	12.25
Labor Force Participation Rate (%)	62.66	10.71	39.25	89.05
Labor Productivity	14,119.7	13,082.98	928.9	68,993
OECD Countries				
GDP Growth (%)	2.22	2.29	−11.30	20.11
FDI (% of GDP)	3.73	9.52	−40.29	81.33
Economic Freedom	7.73	0.40	6.56	8.62
Capital Cumulation (% of GDP)	18.34	10.46	−55.55	66.08
Population Growth	0.50	0.74	−1.32	2.94
Labor Force Participation Rate (%)	61.00	5.12	47.97	77.75
Labor Productivity	74,496.36	39,103.87	14,338	181,776

Figure 1 displays the average annual real GDP growth rate, FDI inflows, and economic freedom for the sampled countries over the entire period (2010–2019). The fitted line in Figure 1a shows a weak positive relationship between FDI and economic growth (R^2 = 0.038). Meanwhile, the fitted line in Figure 1b illustrates a negative correlation between output growth and economic freedom (R^2 = 0.092). The economic freedom of high-growth transition economies appears to cluster around the lower end of the index, while FDI inflows contribute positively to economic growth. However, the correlations do not imply the causation of FDI to economic growth. If economic freedom is vital in fostering economic growth, one would expect that FDI inflows and economic freedom are complements.

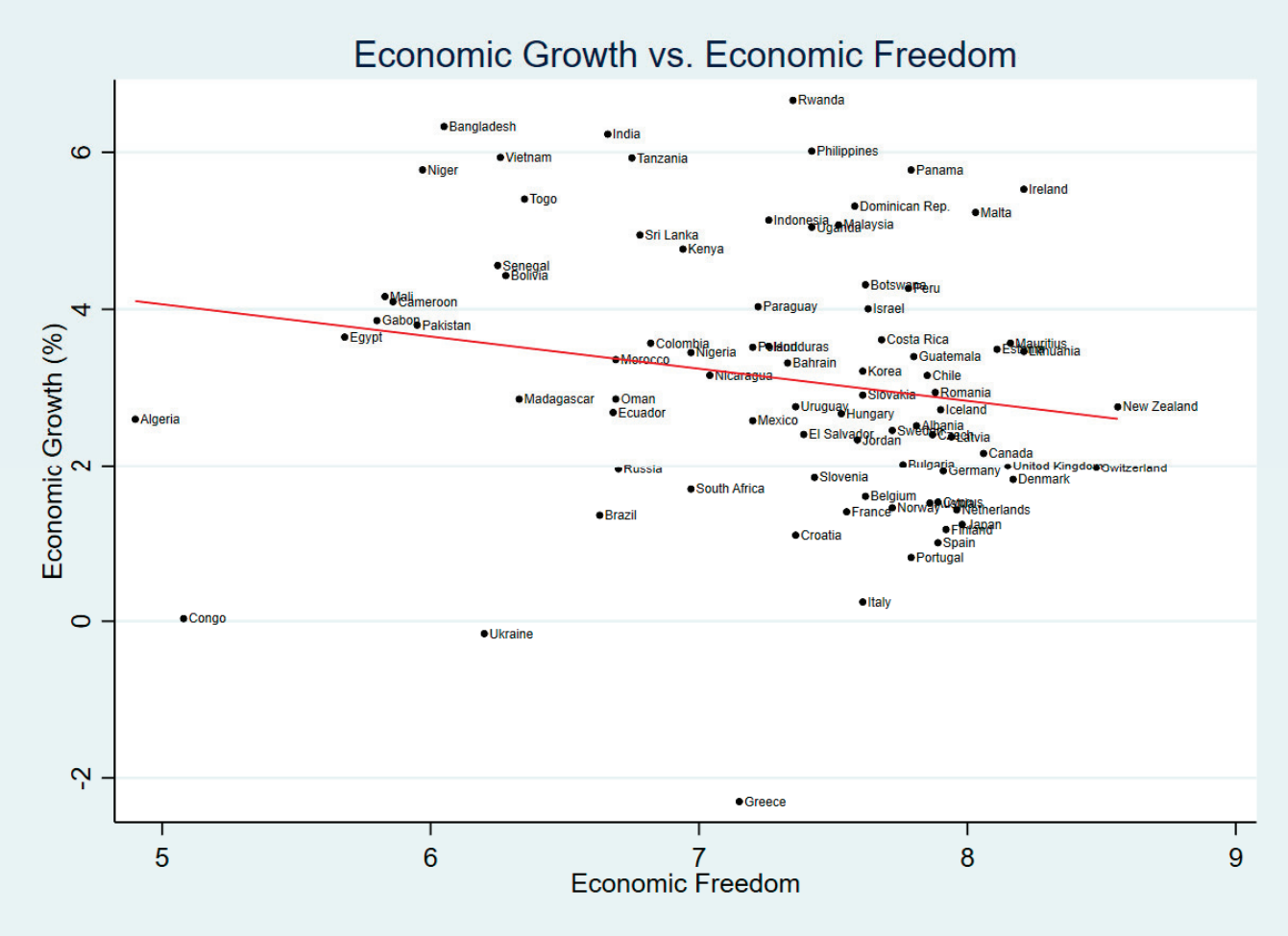
Due to the dynamic nature of the regression equation, FDI may exhibit endogeneity in its relationship with economic growth, which can lead to simultaneity bias when utilizing country-specific dummy variables. To address this issue, this study employs the GMM panel estimator developed by Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998). This approach effectively accounts for country-specific effects, which cannot be adequately addressed with country-specific dummies given the dynamic structure of the model.

The model specification is broadly consistent with other panel data approaches that use FDI to estimate economic growth (for instance, Caselli et al. 1996; Alfaro et al. 2004). Our model also includes labor productivity and the economic freedom index to measure the effect of productivity spillover and economic openness. Three conditional variables, gross capital formation, population growth rate, and labor force participation rate, are vital factors of production. The former measures the investment levels of countries, and both latter variables are used to gauge labor force growth in the countries. The economic freedom index will likely capture most other pertinent variables, such as trade openness and government policies.



(**a**)

Figure 1. *Cont.*



(**b**)

Figure 1. Scatter plots of economic growth vs. FDI and economic freedom. Note: economic growth (in percentage) was computed using real GDP per capita downloaded from the World Bank World Development Indicators, Foreign direct investments are the net inflows of investment to acquire a lasting management interest, and the economic freedom index was taken from the Fraser Institute.

We first specify a growth level equation as follows:

$$y_{it} - y_{it-1} = \beta_1 y_{it-1} + \beta_2 FDI_{it} + \beta_3 EF_{it} + \beta_4 CF_{it} + \beta_5 PG_{it} + \beta_6 LF_{it} + \beta_7 LP_{it} + \eta_i + \gamma_t + \varepsilon_{it} \quad (1)$$

where y_{it} denotes the logarithm of real GDP in country i in year t; FDI_{it} is foreign direct investment, EF_{it} is economic freedom, CF_{it} is gross capital formation, PG_{it} is the population growth rate, LF_{it} is the labor force participation rate, and LP_{it} is labor productivity. η_i is an unobserved country-specific effect reflecting differences in the initial level of efficiency. The period-specific intercept γ_t captures real income changes that are common to all countries, and ε_{it} is the error term. Equation (1) can be rewritten as a dynamic model in the level of GDP by adding y_{it-1} to both sides as follows.

$$y_{it} = \alpha_1 y_{it-1} + \beta_2 FDI_{it} + \beta_3 EF_{it} + \beta_4 CF_{it} + \beta_5 PG_{it} + \beta_6 LF_{it} + \beta_7 LP_{it} + \eta_i + \gamma_t + \varepsilon_{it} \quad (2)$$

where $\alpha = (1 + \beta_1)$. Equation (2) explicates the dynamic structure of the growth equation. However, the OLS estimate of the coefficient on the lagged dependent variable could bias upward as y_{it-1} is positively correlated with the country-specific effects η_i. As proposed by Arellano and Bond (1991), one approach to address this issue is to employ lagged levels of the regressors as instruments, given that the error term is not serially correlated,

and the lagged explanatory variables are weakly exogenous. This alternative approach addresses the presence of the lagged endogenous variable by first differencing Equation (2) to eliminate country-specific effects as follows:

$$\Delta y_{it} = \alpha_1 \Delta y_{it-1} + \beta_2 \Delta FDI_{it} + \beta_3 \Delta EF_{it} + \beta_4 \Delta CF_{it} + \beta_5 PG_{it} + \beta_6 \Delta LF_{it} + \beta_7 \Delta LP_{it} + \Delta \varepsilon_{it} \quad (3)$$

where the first difference equation removes omitted-variable bias and country-specific effects. Then, following Arellano and Bond (1991), we set the following moment conditions:

$$E[y_{it-s} \Delta \varepsilon_{it}] = 0 \text{ for } s \geq 2; t = 3, \ldots T$$

$$E[FDI_{it-s} \Delta \varepsilon_{it}] = 0 \text{ for } s \geq 2; t = 3, \ldots T$$

$$E[EF_{it-s} \Delta \varepsilon_{it}] = 0 \text{ for } s \geq 2; t = 3, \ldots T$$

$$E[CF_{it-s} \Delta \varepsilon_{it}] = 0 \text{ for } s \geq 2; t = 3, \ldots T$$

$$E[PG_{it-s} \Delta \varepsilon_{it}] = 0 \text{ for } s \geq 2; t = 3, \ldots T$$

$$E[LF_{it-s} \Delta \varepsilon_{it}] = 0 \text{ for } s \geq 2; t = 3, \ldots T$$

$$E[LP_{it-s} \Delta \varepsilon_{it}] = 0 \text{ for } s \geq 2; t = 3, \ldots T$$

Despite being able to control country-specific effects and simultaneity bias, difference GMM estimates potentially suffer from instrumental problems with small samples. If the dependent variable was persistent and close to being a random walk, applying difference GMM estimation would yield both a biased and inefficient estimate of α_1 in finite samples, particularly acute with a relatively shorter estimation period.

Moreover, economic growth is dynamic and dependent on past levels, and the independent variables are not strictly exogenous, given that FDI and domestic investment may be correlated with past and current realizations of the error. Empirical research in international economics acknowledges that FDI, a dynamic process strongly dependent on past observations, could also potentially lead to disturbances that are likely heteroskedastic and serially correlated. One source of endogeneity arises from the possibility that current values of FDI are a function of past economic performance. Blundell and Bond (1998) attribute the poor precision and significant finite sample bias of the difference GMM estimator to lagged levels of the independent variables being weak instruments and propose using system GMM to address the simultaneity bias in the independent variables. The system dynamic panel GMM estimator effectively avoids the deviation caused by this endogeneity problem by utilizing Equations (1) and (3) to provide more consistent estimates as a second condition for utilizing system GMM. The approach reduces the biases and imprecision by using additional moment conditions wherein difference equations use level instruments, and level equations use difference instruments. The estimated data, which include a short period and a large number of countries, meet the requirements of a small period and a large number of countries to be estimated by GMM empirically.

Following Arellano and Bover (1995), we include the additional moment conditions for the second part of the system, the level equation.

$$E[(y_{it-s} - y_{it-s-1})(\eta_i + \varepsilon_{it})] = 0 \text{ for } s = 1$$

$$E[(FDI_{it-s} - FDI_{it-s-1})(\eta_i + \varepsilon_{it})] = 0 \text{ for } s = 1$$

$$E[(EF_{it-s} - EF_{it-s-1})(\eta_i + \varepsilon_{it})] = 0 \text{ for } s = 1$$

$$E[(CF_{it-s} - CF_{it-s-1})(\eta_i + \varepsilon_{it})] = 0 \text{ for } s = 1$$

$$E[(PG - PG_{it-s-1})(\eta_i + \varepsilon_{it})] = 0 \text{ for } s = 1$$

$$E[(LF_{it-s} - LF_{it-s-1})(\eta_i + \varepsilon_{it})] = 0 \text{ for } s = 1$$

$$E[(LP_{it-s} - LP_{it-s-1})(\eta_i + \varepsilon_{it})] = 0 \text{ for } s = 1$$

The GMM estimators are applied with two-step variants using the optimal weighting matrices, in which the moment conditions are weighted by a consistent estimate of their covariance matrix. This would be asymptotically more efficient, as explained in Arellano and Bond (1991). However, using the two-step estimator in small samples would potentially result in the proliferation of instruments, leading to biased standard errors and parameter estimates. To solve this problem, Windmeijer (2005) proposed a finite sample bias-corrected standard error formula for the two-step linear GMM. Following Roodman (2009), we use the above moment conditions and employ the two-step estimator.

We further explore the role of FDI in economic growth, focusing on productivity spillovers and economic freedom. To clarify these relationships, we introduce an interaction term to assess their contingency. If this term is positive and significant, it suggests that the impact of FDI on growth is enhanced by increased productivity and economic freedom. We anticipate that this interaction term will be more significant in transition economies compared to OECD countries. This is because the benefits of FDI inflows on economic growth are generally greater during the developing phase of an economy, especially as these countries implement more flexible economic policies. Strengthening the freedom of economic activities is crucial for facilitating FDI spillovers. This hypothesis is consistent with recent studies, which indicate that the recipient countries' absorptive capacity influences the FDI's effectiveness on growth. Thus, the advantages of economic freedom can be seen as both direct and indirect.

Following Equations (2) and (3), we interact FDI with respective labor productivity and economic freedom and use each interaction term as a regressor. To ensure that the interaction term does not proxy FDI or the level of labor productivity and economic freedom, both latter variables were included in the regression independently. Thus, we run the following regression:

$$y_{it} = \alpha_1 y_{it-1} + \beta_2 FDI_{it} + \beta_3 EF_{it} + \beta_4 CF_{it} + \beta_5 PG_{it} + \beta_6 LF_{it} + \beta_7 LP_{it} + \beta_8 FDI_{it} * LP_{it} + \varepsilon_{it} \quad (4)$$

$$y_{it} = \alpha_1 y_{it-1} + \beta_2 FDI_{it} + \beta_3 EF_{it} + \beta_4 CF_{it} + \beta_5 PG_{it} + \beta_6 LF_{it} + \beta_7 LP_{it} + \beta_8 FDI_{it} * EF_{it} + \varepsilon_{it} \quad (5)$$

4. Empirical Results

Before conducting the GMM tests, we examine the stationarity of the data series using the Levin-Lin-Chu (LLC) test (Levin et al. 2002) and Im-Pesaran-Shin (IPS) tests (Im et al. 2003), along with the Fisher-ADF and Fisher-PP tests developed by Maddala and Wu (1999) and Choi (2001). Table 2 presents the results of these tests. At the 5 percent significance level, the LLC, IPS, and both Fisher tests provide strong evidence that the six series, *GDP*, *FDI*, *EF*, *CF*, *LF*, and *LP*, are stationary, while only two statistics LLC and IPS show that population growth is of the I(1) process.

Table 2. Panel data unit root test result.

			Chi-Squared Test	
Variable	**LLC**	**IPS**	**ADF-Fisher**	**PP-Fisher**
GDP	−20.6888 *	−3.1327 *	764.4010 *	32.5363 *
FDI	−51.2237 *	−24.3951 *	808.5611 *	34.9455 *
Economic Freedom (EF)	−31.0783 *	−15.7595 *	940.1037 *	42.1217 *
Capital Cumulation (CF)	−10.7141 *	−17.6577 *	716.8125 *	29.9402 *
Population Growth	−0.00042	−0.0083	310.1695 *	7.7560 *
Labor Force Participation Rate (LF)	−77.5358 *	−41.1428 *	1246.3047 *	56.2808 *
Labor Productivity (LP)	−36.9462 *	−4.9398 *	720.6632 *	30.1502 *

Notes: * rejects the null hypothesis of unit root; lags in each test were defined by the Akaike information criterion.

Growth regressions are outlined with a series of models: pooled OLS, fixed effects, difference GMM, and system GMM. To apply dynamic panel data models with robust properties, we utilize both two-step difference GMM and system GMM to deal with

heteroskedasticity and simultaneity biases likely to exist among the variables.[5] According to Nickell (1981), consistent regression coefficients resulting from difference GMM and system GMM should lie within the coefficients stemming from pooled OLS (upper bound; upward bias) and fixed effects estimators (lower bound; downward bias).

Table 3 demonstrates regression results using pooled OLS, fixed effects, difference GMM, and system GMM estimators. We use Hansen (1982) *J*-test to verify GMM consistency that the instruments are valid. The null hypothesis assumes that the instrumental variables satisfy the conditions, and the alternative hypothesis means that the instruments are not entirely exogenous or have been incorrectly excluded from the model (Baum et al. 2003). The Hansen test results suggest that the null hypothesis is not rejected, thus allowing the use of the GMM models. We also consider the test of second-order serial correlation of the error term suggested by Arellano and Bond (1991), in which the null hypothesis of no serial correlation of the error term is not rejected, implying the GMM estimator is valid.

Table 3. Preliminary regression results.

	Pooled OLS	**Fixed Effect**	**Difference GMM**	**System GMM**
Lagged GDP (log)	0.9993 ***	0.7454 ***	0.7656 ***	0.9969 ***
	(0.0010)	(0.0367)	(0.1464)	(0.0065)
FDI as % of GDP	0.0008 **	0.0014 ***	0.0012	0.0024 **
	(0.0004)	(0.0005)	(0.0008)	(0.0011)
Economic Freedom	0.0107 ***	0.0090	0.0137	0.0347 ***
	(0.0038)	(0.0086)	(0.0114)	(0.0087)
Capital Cumulation as % of GDP	0.0010 ***	0.0015 ***	0.0014 *	0.0019 **
	(0.0003)	(0.0005)	(0.0008)	(0.0010)
Population Growth	0.0033 ***	−0.0015	0.0007	−0.0050
	(0.0012)	(0.0025)	(0.0006)	(0.0038)
Labor Force Participation Rate (log)	−0.0028	0.1889 ***	0.1421	−0.0776
	(0.0134)	(0.0725)	(0.2552)	(0.0557)
Labor Productivity (log)	−0.0091 ***	0.2607 ***	0.1718	−0.0320 ***
	(0.0019)	(0.0605)	(0.2549)	(0.0076)
AR(1) test (*p*-value)			0.040	0.007
AR(2) test (*p*-value)			0.147	0.157
Hansen Test (*p*-value)			0.135	0.194
Number of Observations	840	840	756	840
Number of Countries	84	84	84	84
Number of Instruments			67	74

Notes: The dependent variable is the log of GDP. Robust standard errors are in parentheses. Time dummies are included in all the regressions (not reported). *, **, and *** indicate that the coefficients are significant at the 10, 5, and 1 percent levels. Column 3 reports the results of the two-step Arellano and Bond (1991) difference GMM. Column 4 shows the results of the two-step Blundell and Bond (1998) system-GMM estimator with Windmeijer finite-sample correction. For both models, the instruments are the economic freedom index, population growth, and labor productivity. To avoid the problem of instrument proliferation and consequently overfitting of the endogenous explanatory variables, we collapse the number of instruments by dropping deeper lags as instruments (Roodman 2009).

The coefficients on the lagged dependent variables in all four models have a value of less than or close to one, providing strong evidence of conditional convergence. The difference GMM estimate coefficient for the lagged dependent variable is close to the fixed effects estimator, which implies that the difference GMM estimate is somewhat downward biased. The system GMM estimator with the coefficient of the lagged dependent variable falling between pooled OLS and difference GMM estimators is much closer to the upper

bound of the pooled OLS estimate, provides consistent and efficient estimates, overcomes the endogeneity problem, and is a better fit for the selected panel data.

The coefficient generated by the system GMM estimator shows that economic freedom estimates are positive and significant, confirming the positive relationship between economic freedom and growth. Capital investment from FDI inflows and domestic accumulation also drive economic growth, and both sources of capital formation are equally effective in explaining economic growth. While the evidence shows that FDI leads to economic growth, a multitude of factors can still affect this relationship. Hall and Jones (1999) find that social infrastructure drives productivity and growth success through high physical and human capital investment. Differences in social infrastructure across countries can cause differences in capital accumulation, educational attainment, and productivity, which leads to differences in income between countries, thus affecting long-run economic performance concerning productivity and investment.[6]

The coefficients of population growth and labor force participation rate are negative but not statistically significant, while the coefficient on labor productivity is negative and statistically significant with system GMM estimates. This could be partially explained by Meyer and Sinani (2009) who find a curvilinear relationship between productivity spillovers and the level of economic development. The sample comprises developed, developing, and less developed countries, so the link between productivity and growth could thus be negative or positive.

Table 4 presents the results of each regression using different indicators to assess the effect of FDI. Column (1) uses labor productivity as the indicator, while column (2) uses economic freedom. The key finding is that the coefficients of both interaction terms are statistically significant, regardless of whether FDI inflows are included as a separate regressor.[7] The marginal effect of FDI on economic growth appears to depend on the levels of productivity and economic freedom. FDI inflows alone appear to be significant but negative in general. This may be attributed to the fact that, without advancement in economic freedom, FDI inflows do not contribute positively to growth.[8] Without improvements in productivity, FDI inflows may not channel efficiently and could even hinder growth. The findings indicate that there is a productivity spillover effect, and that economic freedom enhances the relationship between FDI inflow and growth. However, it is important to note that our main analysis suggests that the positive impact of FDI on growth tends to increase steadily with higher levels of labor productivity and economic freedom.[9] However, a certain level of labor productivity and economic freedom may be necessary before the benefit of FDI can be fully realized in host countries. Only those countries that possess adequate absorptive capacity and implement progressive and transparent economic policies will likely reap the advantages of FDI inflows.

Table 5a,b presents the results of models estimated using the system GMM, separated into subsets for OECD and non-OECD countries. In the regressions that exclude interaction terms, the coefficients for FDI are positive and statistically significant. Notably, the FDI coefficient is approximately twice as large for OECD countries compared to non-OECD countries. Additionally, the coefficients for domestic capital formation are significant and roughly equal for both groups.

The interaction terms indicate a strong positive relationship between FDI inflows and productivity, as well as between FDI inflows and economic freedom, for both transition economies and OECD countries. Although the coefficient estimates for the FDI-productivity interaction term are similar across both groups, the interaction between FDI inflows and economic freedom is more pronounced in OECD countries compared to non-OECD countries. This discrepancy may suggest that the interaction term captures a general trend where FDI contributes more significantly to the growth of transition and OECD countries that possess a minimum threshold of economic infrastructure. For OECD countries, greater economic freedom appears to enhance their absorptive capacity, which is crucial for economic growth driven by FDI inflows.

Table 4. Regression results with the interaction terms.

	(1)	(2)
Lagged GDP (log)	0.9981 ***	0.9979 ***
	(0.0047)	(0.0058)
FDI as % of GDP	−0.0158 *	−0.0092 *
	(0.0083)	(0.0053)
Economic Freedom	0.0243 **	0.0238 *
	(0.0117)	(0.0140)
Capital Cumulation as % of GDP	0.0023 ***	0.0015 *
	(0.0008)	(0.0008)
Population Growth	−0.0002	0.0023
	(0.0029)	(0.0038)
Labor Force Participation Rate (log)	−0.0232	−0.0438
	(0.0332)	(0.0422)
Labor Productivity (log)	−0.0283 ***	0.0241 ***
	(0.0061)	(0.0075)
FDI × LP	0.0017 **	
	(0.0008)	
FDI × EF		0.0015 **
		(0.0007)
AR(1) Test (*p*-value)	0.011	0.026
AR(2) Test (*p*-value)	0.058	0.078
Hansen Test (*p*-value)	0.121	0.142
Number of Observations	840	840
Number of Countries	84	84
Number of Instruments	53	66

Notes: The dependent variable is the log of GDP. Robust standard errors are in parentheses. Time dummies are included in all the regressions (not reported). *, **, and *** indicate that the coefficients are significant at respective 10, 5, and 1 percent levels. Both columns report two-step Blundell and Bond (1998) system-GMM estimator with Windmeijer finite-sample correction. Labor force participation rate and population growth are regarded as exogenous; the other variables are treated as endogenous in the estimation and are instrumented with their lagged values. The number of instruments collapsed by dropping deeper lags as instruments to avoid the problem of instrument proliferation and overfitting of the endogenous explanatory variables (Roodman 2009).

Table 5. (a). Regression results with alternative specifications: non-OECD countries. (b). Regression results with alternative specifications: OECD countries.

(**a**)			
	(1)	**(2)**	**(3)**
Lagged GDP (log)	0.9978 ***	0.9945 ***	0.9987 ***
	(0.0059)	(0.0054)	(0.0032)
FDI as % of GDP	0.0014	−0.0150 *	−0.0106 *
	(0.0009)	(0.0084)	(0.0064)
Economic Freedom	0.0220 ***	0.0246 ***	0.0128
	(0.0075)	(0.0121)	(0.1058)
Capital Cumulation as % of GDP	0.0015 *	0.0020 ***	0.0032 ***
	(0.0009)	(0.0010)	(0.0012)
Population Growth (%)	−0.0004	−0.0003	−0.0003
	(0.0041)	(0.0033)	(0.0026)
Labor Force Participation Rate (log)	−0.0602	−0.0332	0.0078
	(0.0419)	(0.0342)	(0.0416)
Labor Productivity (log)	−0.0290 ***	−0.0332 ***	−0.0184 *
	(0.0133)	(0.0108)	(0.0106)
FDI × LP		0.0016 ***	
		(0.0008)	
FDI × EF			0.0068 **
			(0.0034)

Table 5. *Cont.*

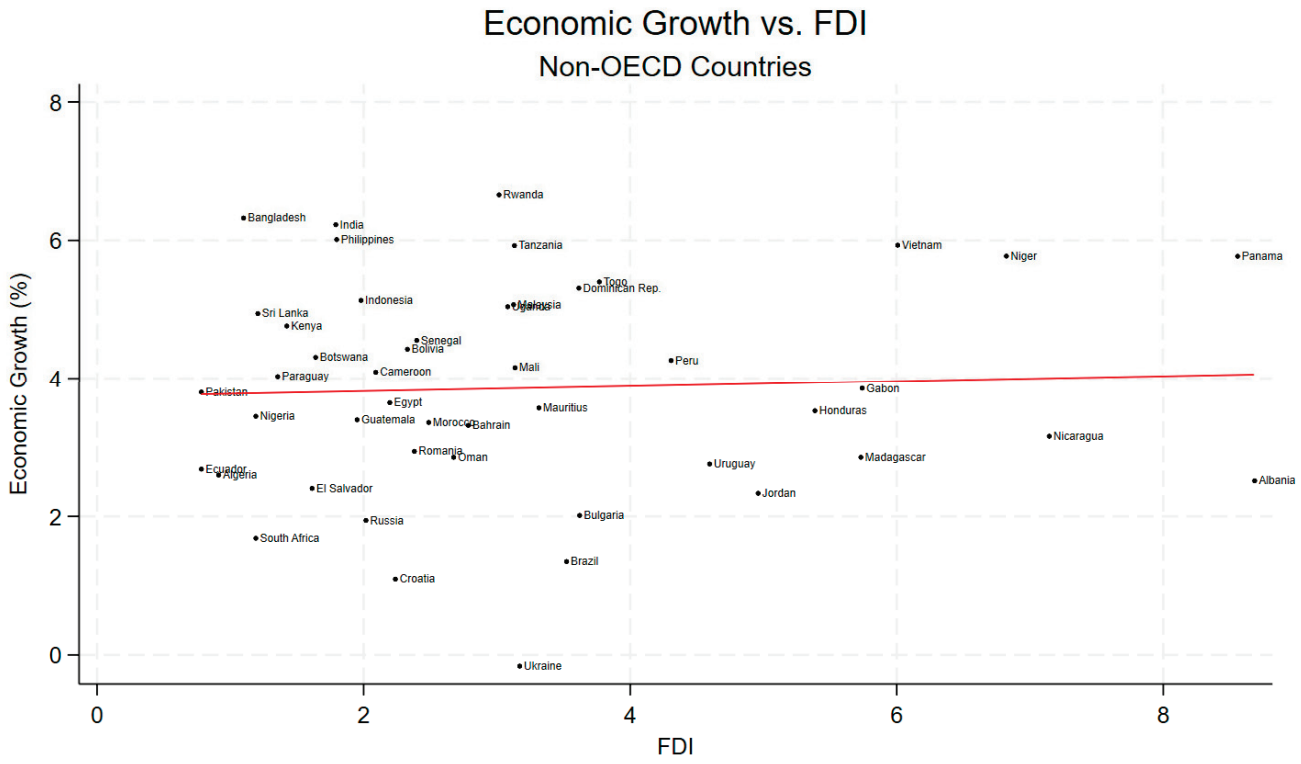
AR(1) Test (*p*-value)	0.017	0.040	0.044
AR(2) Test (*p*-value)	0.150	0.094	0.089
Hansen Test (*p*-value)	0.237	0.355	0.173
Number of Observations	500	500	500
Number of Countries	50	50	50
Number of Instruments	47	49	38
(**b**)			
	(1)	**(2)**	**(3)**
Lagged GDP (log)	0.9883 ***	0.9886 ***	0.9931 ***
	(0.0066)	(0.0079)	(0.0055)
FDI as % of GDP	0.0028 **	−0.0142 **	−0.0153 **
	(0.0011)	(0.0067)	(0.0060)
Economic Freedom	0.0441	0.0113	−0.0061
	(0.0457)	(0.0194)	(0.0247)
Capital Cumulation as % of GDP	0.0016 *	0.0012 *	0.0014 *
	(0.0009)	(0.0007)	(0.0007)
Population Growth	0.0119 *	0.0118 *	0.0071 *
	(0.0066)	(0.0061)	(0.0042)
Labor Force Participation Rate (log)	−0.1143	−0.0577	−0.0061
	(0.0942)	(0.0546)	(0.0396)
Labor Productivity (log)	−0.0076	−0.0064	−0.0082
	(0.0125)	(0.0091)	(0.0098)
FDI × LP		0.0014 **	
		(0.0006)	
FDI × EF			0.0022 ***
			(0.0008)
AR(1) Test (*p*-value)	0.033	0.032	0.064
AR(2) Test (*p*-value)	0.149	0.173	0.103
Hansen Test (*p*-value)	0.291	0.239	0.129
Number of Observations	340	340	340
Number of Countries	34	34	34
Number of Instruments	34	27	29

Notes: The dependent variable is the log of GDP. Robust standard errors are in parentheses. Time dummies are included in all the regressions (not reported). *, **, and *** indicate that the coefficients are significant at respective 10, 5, and 1 percent levels. All three columns report two-step Blundell and Bond (1998) system-GMM estimator with Windmeijer finite-sample correction. Labor productivity, labor force participation rate, and population growth are predetermined variables; foreign direct investment and capital accumulation are treated as endogenous in the estimation and are instrumented with their lagged values. The number of instruments collapsed by dropping deeper lags as instruments to avoid the problem of instrument proliferation and overfitting of the endogenous explanatory variables (Roodman 2009).

Economic freedom primarily drives economic growth in non-OECD countries. However, when interaction terms are included in the regression analysis, FDI inflows can have a negative effect on growth. Generally, FDI inflows are beneficial due to productivity spillover effects, which appear to be similar for both OECD and transition economies. OECD countries tend to have a greater capacity to absorb these FDI spillovers, particularly when economic freedom is improved. Nevertheless, economic freedom alone does not ensure robust economic growth in OECD countries; its impact on enhancing economic growth is more significant in non-OECD countries.

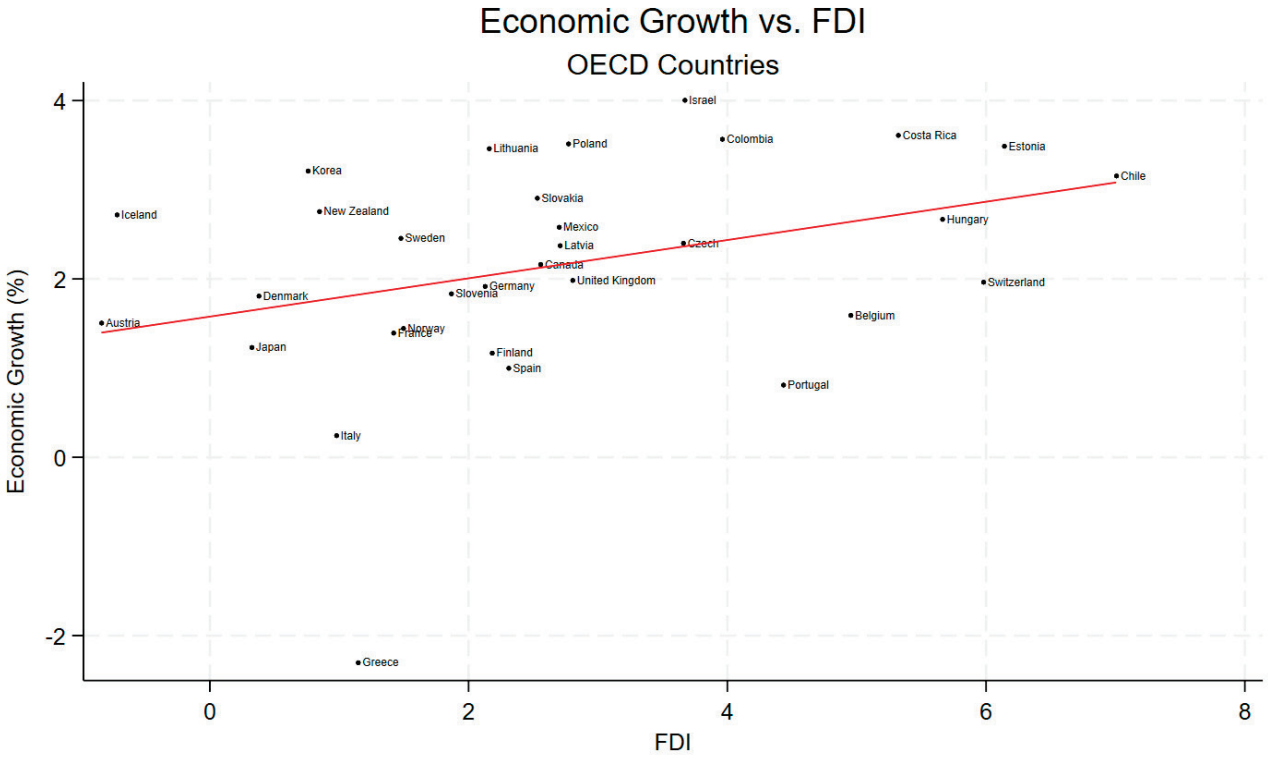
The average population growth rate in non-OECD countries is three times higher than in OECD countries. While a larger population can stimulate economic growth in OECD countries, it may place a significant economic burden on non-OECD countries. The effect of labor force participation on growth is negative but statistically insignificant for both OECD and non-OECD countries. Furthermore, the results regarding labor productivity are mixed for both groups, although it seems to have a more detrimental impact on economic growth in non-OECD countries.

Figure 2 presents data from 2010 to 2019 to investigate the relationship between economic growth and FDI inflows in OECD and transition economies. The fitted lines reveal a significantly stronger positive correlation between FDI and economic growth in OECD countries than in non-OECD countries. While many non-OECD countries are currently in transition and experiencing relatively high economic growth, OECD countries appear to gain more advantages from FDI inflows. Figure 3 illustrates the relationship between economic freedom and growth, distinguishing between OECD and transition economies. The fitted lines show a weak positive correlation between output growth and economic freedom in non-OECD countries, while a negative correlation is observed in OECD countries. Although OECD nations typically create a more favorable environment for economic freedom, their output growth appears to decrease in response to changes in this freedom.



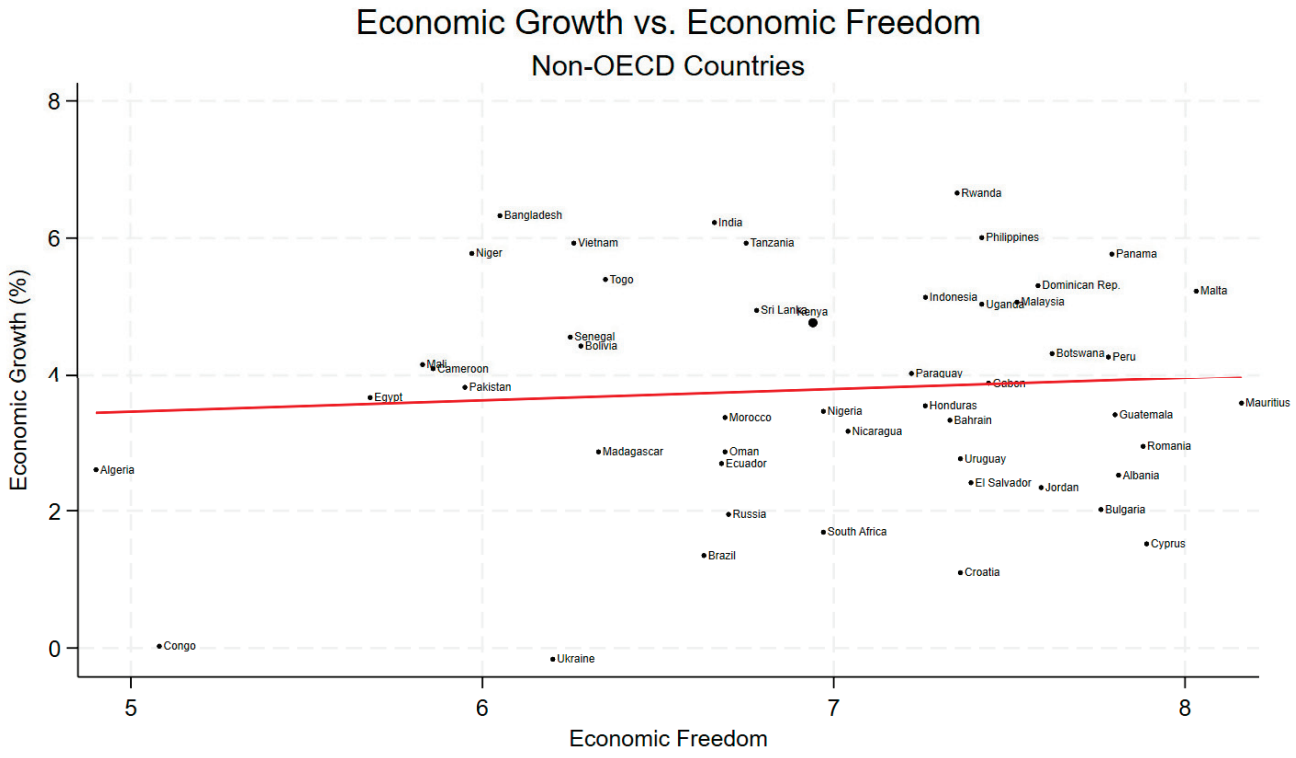
(**a**)

Figure 2. *Cont.*



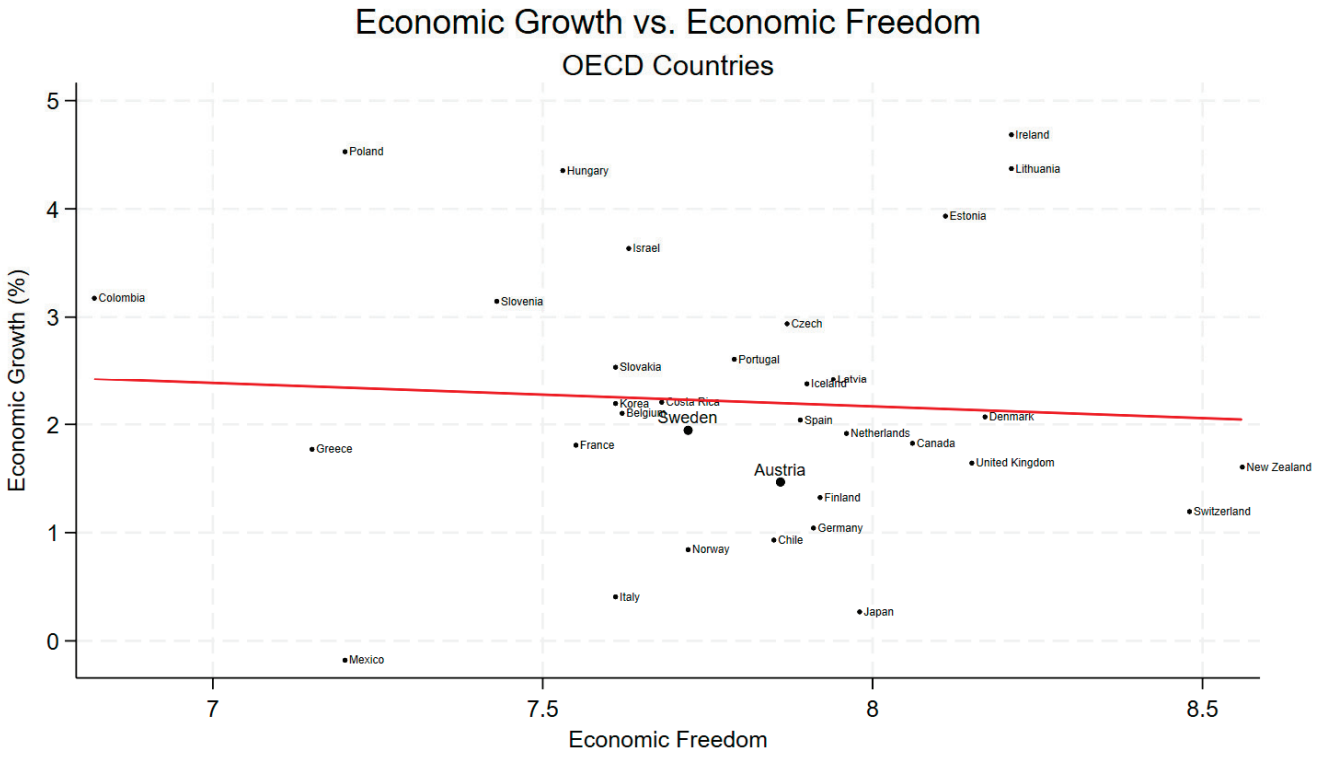
(**b**)

Figure 2. Scatter plots of economic growth vs. FDI for non-OECD and OECD countries.



(**a**)

Figure 3. *Cont.*



(**b**)

Figure 3. Scatter plots of economic growth vs. economic freedom.

5. Conclusions

There is a consensus among policymakers globally that FDI inflows are a vital source of external financing for developing countries, emerging economies, and nations undergoing transition (UNCTAD 2019). FDI inflows are instrumental in transferring capital and technology, enhancing productivity, and driving economic growth. They supply essential capital for economic development and play a significant role in job creation, particularly in economies advancing toward higher levels of development. In countries transitioning between stages of development, economic openness fosters an environment that facilitates effective capital allocation, ultimately resulting in increased productivity and economic expansion. Furthermore, productivity improvements associated with FDI inflows can often be attributed to the introduction of new capital and technology. Several factors may explain the relationship between FDI inflows and enhanced productivity levels.

We utilized the GMM system estimator to analyze a panel of 84 countries spanning the years 2010 to 2019. Our study investigates the productivity spillover effects of FDI inflows, as well as the role of economic freedom in attracting foreign investment. By categorizing the countries into two groups—transition economies and OECD economies—we focused on the impact of FDI inflows on economic growth and the mechanisms through which this influence operates, especially in countries at varying stages of development. Our empirical findings reveal that FDI inflows generally provide significant productivity spillover benefits, which are relatively comparable between OECD and transition economies. Economic freedom is a critical factor in attracting FDI inflows; OECD countries with higher levels of economic freedom tend to exhibit greater absorptive capacity for FDI spillovers. Nonetheless, economic freedom alone does not guarantee robust economic growth in OECD nations; its effects are more pronounced in fostering economic growth in non-OECD countries. These results further corroborate earlier studies, affirming that only economies with adequate levels of economic infrastructure and development can fully capitalize on the benefits of FDI inflows.

This paper investigates the general spillover effects of FDI and enriches the existing literature by examining the relationship between FDI presence, productivity, and economic freedom. The study focuses explicitly on distinct groups of transition economies and OECD countries. Although there are policies aimed at attracting foreign investment, empirical evidence regarding the growth effects of FDI inflows remains influenced by the unique conditions of each country. Furthermore, when different definitions of spillover variables are employed, the results can vary significantly across nations. This underscores an important area for further research to explore how levels of economic freedom and stages of development in countries shape this overall relationship and its evolution over time.

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Data Availability Statement: Data available upon request.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Data Sources and Descriptions for Empirical Analysis

Gross Domestic Product (GDP). The World Bank World Development Indicator in its Data Bank compiles GDPs in various countries. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for the depreciation of fabricated assets or for the depletion and degradation of natural resources. Data are in constant 2015 prices, expressed in US dollars. Dollar figures for GDP are converted from domestic currencies using 2015 official exchange rates. For a few countries where the official exchange rate does not reflect the rate effectively applied to actual foreign exchange transactions, an alternative conversion factor is used.

Foreign Domestic Investments (FDIs). Foreign direct investments are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. This series shows net inflows (new investment inflows less disinvestment) in the reporting economy from foreign investors and is divided by GDP.

Economic Freedom Index (EFI). The Fraser Institute compiles and publishes an annual index of economic freedom in each country. The degree of economic freedom is measured in five broad areas: size of government, legal system and property rights, sound money, freedom to trade internationally, and regulation.

Gross Capital Formation (GCF). World Bank national accounts data and OECD National Accounts compile these data files. Gross capital formation consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. Fixed assets include land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. Inventories are stocks of goods held by firms to meet temporary or unexpected fluctuations in production or sales, and "work in progress". According to the 2008 SNA, net acquisitions of valuables are also considered capital formation. Data are in constant 2015 prices, expressed in US dollars.

Population Growth (PG). The World Health Organization (WHO) publishes the annual average rate of the change of population size for each of the given countries in the world. The growth rate expresses the ratio between the annual increase in the population size and the total population for a given year multiplied by 100. The annual increase in the population size is defined as a sum of differences: the difference between births and deaths and the difference between immigrants and emigrants in a given country over a given year.

Labor Force Participation Rate (LFP). The International Labor Organization Statistics Database (ILOSTAT) is a global reference for international labor statistics, providing a comprehensive database and resources for producing labor statistics. The labor force participation rate is the proportion of the population ages 15 and older that is economically active: all people who supply labor for producing goods and services during a specified period.

Labor Productivity (LP). The International Labor Organization Statistics Database (ILOSTAT) is a global reference for international labor statistics, providing a comprehensive database and resources for producing labor statistics. Labor productivity is measured by output per worker. Data are in constant 2015 prices, expressed in US dollars.

Notes

1 Antràs (2020) in his background paper for the 2020 World Development Report explains that countries participating in global value chain are subject to the international fragmentation of production that constitutes the use of foreign value added embodied in intermediate inputs.

2 Hanson et al. (2005) also suggest that FDI can sustain growth by enhancing the existing stock of knowledge within the host economy through workforce training and skill development. Niles (2007) also indicates that FDI introduces innovative management practices and organizational structures to host countries through capital accumulation and knowledge spillovers.

3 Alfaro et al. (2004, 2010) and Durham (2004) also show that a country's capacity to take advantage of FDI externalities depends on the development of the financial markets.

4 Data sources and descriptions for empirical analysis are provided in Appendix A.

5 The two-step GMM estimator weighs the moment conditions by a consistent estimate of their covariance matrix, which makes the two-step estimator asymptotically more efficient than the one-step estimator.

6 Erroneous inferences would arise due to correlation with unobserved heterogeneity. Using panel data with instrumental variables could control for possibly correlated, time-invariant heterogeneity without observing it (Arellano 2003).

7 The coefficients and t-statistics on the interaction term are around 0.00027 and 2.65 for labor productivity and 0.0013 and 2.30 for the economic freedom index in the regressions that do not include FDI/GDP as a separate regressor.

8 This corresponds to the findings of Azman-Saini et al. (2010) who show that FDI by itself has no direct effect on economic growth. The effect of FDI is contingent on the level of economic freedom in the host countries.

9 The interaction between FDI and LP can be written as a linear model as $y = w_0 + w_1(FDI) + w_2(LP) + w_3(FDI)(LP)$, where the interaction term $(FDI)(LP)$ can be absorbed into the coefficient for FDI, making it depend on LP such that $y = w_0 + v_1(FDI)(LP) + w_2(LP)$. $v_1(LP) = w_1 + w_3(LP)$ is a function that depends on LP. So, when adding an interaction term, the coefficient of FDI can vary depending on the coefficient of LP. This operation only touches the coefficients, not the variables themselves, so it does not imply a collinearity between FDI and LP. This analogy is also applied to the interaction of FDI and EF.

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Review

Challenges for Customs Risk Management Today: A Literature Review

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Abstract: Changes and uncertainty in the customs operating environment and the growth of trade and travel volumes have affected how customs administrations manage and approach their tasks. As a result of technological development, the role of customs in border control has changed dramatically. Thus, the massive volume of goods, the way they are traded worldwide, and the speed of such transactions create additional fiscal, security, financial, and safety risks, affecting the resources available to customs services. The current geopolitical situation has significantly impacted the role of customs services. The topic is relevant to simultaneously assure both the quality of the services provided by the customs and compliance with the requirements set in the framework of limited resources. This study focuses on customs risk management (CRM) issues. It acknowledges that the customs services must continuously improve their operational methods, including promoting a more structured, integrated, and systematic way to manage customs risks. Based on the literature review, we examine the CRM-related challenges and how scholars address them in the scientific literature. This study aims to identify and analyse the contemporary challenges in CRM from its effectiveness point of view. We employ a systematic literature review, searching in most recognised databases and covering the period of 2005–2024. We follow this with a qualitative content analysis and synthesis, summarising and discussing the study results. We identify and discuss relevant key factors contributing to effective CRM. Finally, we conclude with the implications of the findings for CRM practice and policy, as well as with various potential developments in CRM that we suggest for further work.

Keywords: international trade; integration processes; effectiveness; customs standards; risk management

1. Introduction

In June 2005, the WCO's Council meeting in Brussels adopted the SAFE Framework of Standards, which sets international standards for customs to secure and facilitate global trade. The document is updated every three years to ensure it remains relevant and reflects new opportunities, challenges, and related solutions, including improving supply chain security and efficiency based on mutual trust and transparency (WCO 2021). The SAFE standard system is based on modern international models for producing and distributing goods, creating the conditions for international trade and facilitating international trade. The standards aim to promote and encourage the movement of goods across borders for buyers and sellers. Thus, this system was the first to require the Authorized Economic Operator (AEO) traders to gain an advantage over other traders through reduced risk assessment, reduced inspection intensity, and the faster processing of goods, which means time and cost savings. The system benefits companies that meet minimum supply chain security standards and best practices (WCO 2021). The SAFE Framework of Standards

was one of the first to establish risk management as one of the fundamental principles of modern customs cooperation, enabling customs to carry out appropriate controls with minimum disruption to legitimate trade (WCO 2018). Thus, introducing these principles provides new opportunities for customs cooperation and more reasonably exploring CRM from the point of view of its effectiveness.

The objectives of the customs services of the European Union (EU) are to protect the financial interests of the EU and its Member States, to ensure the security of the EU and its citizens and to protect the environment, where necessary, in close cooperation with other authorities, as well as to protect the EU against unfair and illegal trade while supporting legitimate transactions and to maintain an appropriate balance between customs controls and the promotion of legitimate trade, avoiding unnecessary burdens to honest companies (EP 2013). An effective CRM is recognised as one of the critical conditions for customs services. But what is an effective CRM, and how do scholars in the scientific literature assess it? This research question is being addressed in this study. The research aims to conduct a literature review to identify and analyse the contemporary challenges in CRM.

Legitimate international trade is an essential driver for economic prosperity. The global trading system is vulnerable to terrorist exploitation that would severely damage the entire global economy and the social well-being of nations. Particular governmental organisations supervise and control the international movement of goods. Thus, customs administrations as public authorities are uniquely positioned to provide increased security to the global supply chain and contribute to socio-economic development through revenue collection and trade facilitation (WCO 2021). These authorities operate in today's global economy and face various complex challenges. The primary responsibilities are still revenue collection and protecting society and the environment. However, these complex tasks must be carried out efficiently while facilitating the legal flow of goods (Drobot et al. 2017).

Globalisation has contributed to modern economic growth and social development in many parts of the world. Governments increasingly apply new technologies to ensure public safety and protect their citizens. Technology can significantly contribute to these efforts to contain these threats by improving the efficiency and effectiveness of public administrations (Kim and Kim 2020).

Technological development has ensured the free flow of goods, services, capital, and labour across borders. These transactions have become an essential part of modern economic and social development. At the same time, the cross-border supply of harmful goods and the movement of dangerous persons threaten the economy, society, and environment (Kim and Kim 2020). Therefore, preventing such risk and uncertainty has become an essential agenda item for both governments and citizens.

Over the last 20 years, the increasing value and volume of internationally traded goods and the reduced safety and security of international supply chains, especially after the terrorist attacks of 11 September 2001 in New York, have required customs administrations, as the authorities responsible for implementing customs policy, to manage new trends and challenges. The terrorist attacks of 11 September 2001 undermined the security of international supply chains in several significant ways, significantly changing the global trade and logistics landscape. The attacks showed the vulnerability of international supply chains to terrorist activity, raising awareness and fear of similar attacks in the future. This realisation prompted governments and businesses to reassess and revise their security measures while not increasing administrative barriers for honest supply chain actors. These objectives can only be achieved if the customs authority applies a risk management approach linked to sound governance principles to improve the legal, economic, and social environment in which the market, private enterprise, and civil society operate (Biljan 2014). Customs administrations and private companies should continue focusing on risk management and supply chain security (Shubailat et al. 2024).

In recent years, changes and uncertainties in the customs operating environment, in line with the growth in trade and travel volumes, have influenced how customs administrations manage and approach their tasks. The current geopolitical situation has significantly

impacted the role of customs services in monitoring compliance with sanctions against the Russian Federation and the Republic of Belarus, preventing the movement of sanctioned goods across the EU–Russia and EU–Belarus borders.

Therefore, the effective management of customs risks and opportunities for its development is essential for developing the customs service. Based on the above provided historical insight, the objectives of customs services, globalisation trends, technological development, and geopolitical impacts, the motivation and context for the literature review have been set. Examining today's challenges in CRM and how these challenges are being addressed, we have identified several key factors contributing to effective CRM. These factors include using advanced technologies such as data analytics and machine learning, collaboration and information sharing between customs authorities, and aligning risk management strategies with international standards and best practices.

In the following, we first describe a methodology (Section 2), including a systematic literature review on CRM-related challenges and using the PRISMA approach. We apply this approach to the study objectives properly, design the steps of the literature search and selection, and continue with the qualitative content analysis and synthesis, focusing on the effectiveness aspects of CRM. Then, we overview the reviewed studies and reveal the key findings of content analysis (Section 3), where we consolidate knowledge about the definitions, aims, and objectives of CRM with a bit of interpretation of the results in this section. Considering this study's research question, we identify and describe the impact of CRM (rationale and application) on the organisation's environments. Then, in Section 4, we critically analyse, interpret, and discuss achieved results. The review concludes with key findings, insights, practical implications, and recommendations, acknowledges the study limitations, and provides various suggestions for future research.

2. Methodology

A systematic literature review was conducted for this study, aiming to identify and analyse the contemporary challenges in CRM that scholars in the scientific literature address. Thus, we designed the study considering the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) approach for literature search and selection (Moher et al. 2009; Page et al. 2021). The literature search was conducted in January 2024. SCOPUS, Web of Science, and Science Direct databases were used as information sources to select high-quality peer-reviewed scientific articles related to the topic. Other commonly used databases of this quality were not chosen, minimising the duplication of selected articles. The systematic review method was used in the study. For the initial selection in the databases, the terms "*risk*", "*management*", and "*customs*" in the "*Article title*", "*Abstract*", and "*Keywords*" were used to identify 2438 records. No restrictions were imposed on searching the Web of Science and Science Direct databases. Search in the SCOPUS database was limited to (1) language "*English*"; (2) publication type "*Article*", "*Conference paper*", and "*Book chapter*"; and (3) subject area "*Social Sciences*", "*Business, Management and Accounting*", "*Computer Science*", "*Engineering*", "*Economics, Econometrics and Finance*", "*Decision Sciences*", and "*Mathematics*". The records were identified from other sources, including those relevant to the study of CRM: (1) websites; (2) organisations like the World Trade Organization (WTO), United Nations (UNECE), and World Customs Organization (WCO); and (3) citations from particular references. Additional literature sources were selected on the web. The comparatively extensive Google Scholar search tools were used as an extra source to identify the records. A total of 1408 studies were excluded because of either duplication or unavailability, leaving 1066 potential studies. These studies were examined for further inclusion in the review based on their titles and abstracts, reflecting their relevance to the CRM topic. A few full-text articles were unavailable, and only an abstract was available in English, which, in turn, mentions the key terms of CRM. Thus, 118 studies were retrieved for eligibility assessment. A comparatively large number of studies were identified in which the term "customs" did not correspond to the study object. The selected studies were again screened based on the full-text review, considering

the relevance to the CRM topic. The full-text review was conducted through two stages. First, the lead author reviewed all selected studies, and the fourth author checked and reflected on the selection of particular studies. Second, considering the reasoned opinions, the final consensus-based decisions were made.

Finally, after excluding another 67 studies, 51 were included in the literature review for further content analysis and qualitative synthesis. Figure 1 shows the flowchart with different steps of the literature selection process based on the PRISMA approach.

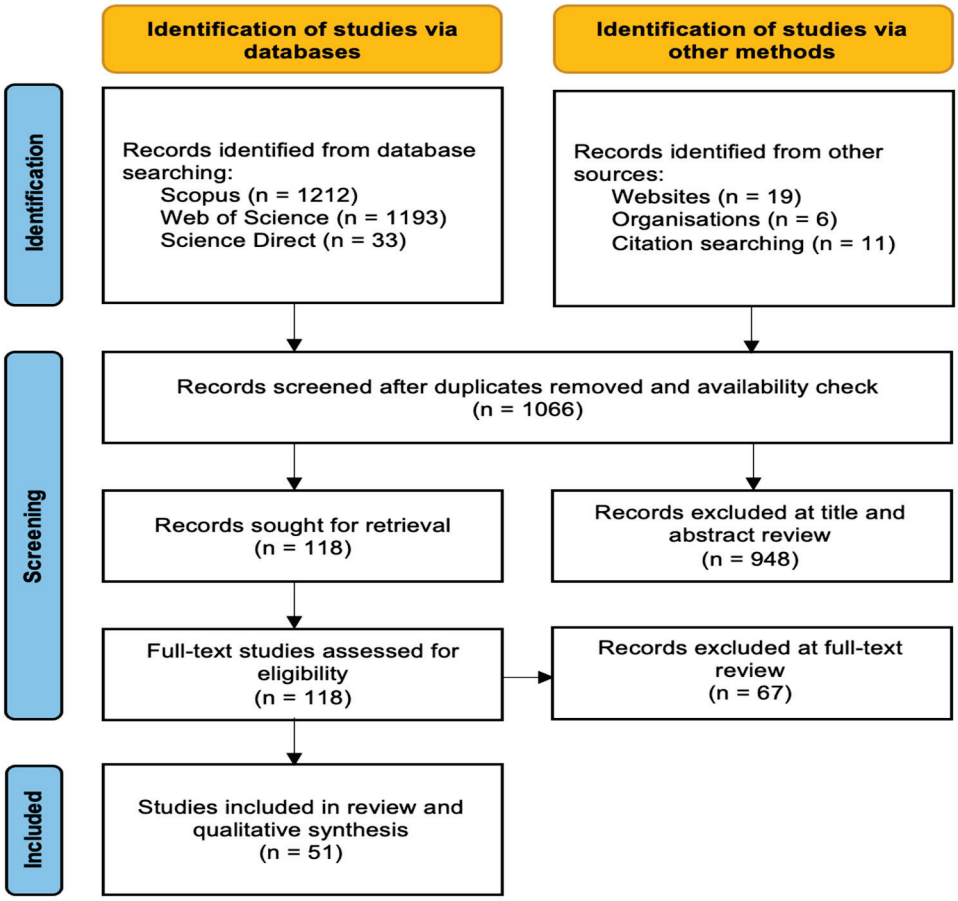


Figure 1. PRISMA flowchart for literature search and selection adapted from Page et al. (2021).

A deductive approach was followed for the content analysis of the selected 51 studies. In particular, we designed a structured Excel spreadsheet to specify and classify extracted information. Thus, based on the content analysis of extracted texts, we (1) grouped related CRM issues into two nodes, "*Concept*" and "*Purpose*", to consolidate knowledge about how the CRM is defined and what its aims and objectives are; (2) identified the impact of CRM on the organisation's internal and external environments and proposed another two nodes, "*Rationale*" and "*Application*", to describe this impact by understanding why effective CRM is needed and where and how it is used. The content analysis and classification were conducted through four stages. First, the lead author reviewed all selected studies, and all authors agreed to specify particular texts into proposed nodes. Second, each author contributed to extracting appropriate text from one of the nodes' texts. Third, the cross-check was organised, and the lead author identified the areas of disagreement. Finally, considering the opinions of all authors, the authors elaborated on the areas of dispute and made final consensus-based decisions. The processes of cross-checking and reflection on the literature selection due to constructive discussions among co-authors were organised to minimise the selection bias before the final decisions. Key decisions were made concluding

each of the three stages designed in the PRISMA flowchart—identification, screening, and inclusion (see Figure 1).

The selection of literature in English is a limitation of the study. Several limitations of this study are related to the analysis and design of the results: (1) the use of advanced visualisation tools, e.g., VOSviewer, Bibliometrix, and CiteSpace, would allow designing research results in a more specific way; (2) additional statistical data or metrics could provide more robust evidence about observed trends; and (3) comparative analysis between different time periods, regions, or types of publications could provide deeper insights into CRM-related challenges.

3. Results

3.1. Overview of the Studies Included in the Review

The 51 reviewed studies included articles (n = 29), conference papers (n = 18), and book chapters (n = 4). Among the 27 publications selected from the SCOPUS database were articles (n = 15), conference papers (n = 11), and book chapters (n = 1). Among publicly available publications on CRM, the number of publications per year was low comparatively. The number of annual publications on CRM topics published from 2005 to 2020 has gradually increased: respectively, 2005–2010 (n = 3), 2011–2015 (n = 14), 2016–2020 (n = 24), and 2021–2024 (n = 10). The majority of the published studies that are available from the SCOPUS database were conducted with participants from China (n = 5), followed by France (n = 3), Ukraine (n = 3), Italy (n = 1), Uzbekistan (n = 2), South Korea (n = 2), Russian Federation (n = 2), the Netherlands (n = 2), Jordan (n = 2), the United States (n = 1), Taiwan (n = 1), South Africa (n = 1), Norway (n = 1), New Zealand (n = 1), Nepal (n = 1), Mongolia (n = 1), Malaysia (n = 1), Georgia (n = 1), and Belgium (n = 1). The largest share of the scientific publications that are available from the SCOPUS database are in the subject area of Computer Science (n = 12), followed by Social Sciences (n = 11), Business, Management and Accounting (n = 9), Economics, Econometrics and Finance (n = 8), Engineering (n = 7), Decision Sciences (n = 4), and Mathematics (n = 4). The overview shows that scholars have widely reflected on CRM and related issues, and there has been a growing scientific interest in recent years. It is evident that the articles mainly study the countries of the authors representing them or do not specifically mention which countries are analysed by the authors.

3.2. Key Findings of Content Analysis

From the studies included in the literature review, we conducted a content analysis focusing on CRM-related challenges. First, we consolidated knowledge from the scientific literature about the definitions, aims, and objectives of CRM. Second, we summarised the achieved findings in Tables 1 and 2 by indicating references.

Focusing on the reasonable modernisation of customs administrations in developing countries, Geourjon and Laporte (2005) and Laporte (2011) pointed to a sophisticated risk management method to facilitate trade by automatically and rationally selecting transactions and promoting a positive effect on revenue performance. They argued towards a systems approach for targeting transactions for inspection for fear of losing revenue and indicated risk analysis as a critical factor in trade facilitation. The risk management approach aims to focus on customs control activities and limited resources, in particular, on specific risks that the measures taken by companies do not sufficiently cover (Liu et al. 2009). Biljan and Trajkov (2012) see a crucial feature of CRM in checking persons, goods, and means of transport. Bukhsh and Weigand (2013) relate the effectiveness of CRM to compliance with specific standards. Effective CRM provides an appropriate balance between trade facilitation and regulatory control and promotes a clear understanding of the nature of possible risks (Biljan 2014). Biljan (2014) describes CRM as a systematic process that identifies and implements all necessary measures to limit risk exposure at different management levels. He also points out a series of procedures to be carried out by customs administrations. Davaa and Namsrai (2015) relate risk management with an efficient and

effective technique from technological progress. Komarov (2016) views it in the context of the application of an automated system facing high-risk transactions.

Table 1. Challenges related to CRM (Concept).

Concept: Definitions of CRM	**References**
- risk analysis is a critical factor in trade facilitation into overall strategies for modernising customs administrations	(Geourjon and Laporte 2005)
- compliance with standards indicates effective risk management	(Bukhsh and Weigand 2013)
- effective CMR is at the core of modern customs operations, allowing an appropriate balance between trade facilitation and regulatory control	(Biljan 2014)
- a clear understanding of the nature of the risks	
- the systematic implementation of procedures: risk identification; risk assessment, consisting of risk analysis and risk evaluation; risk treatment; monitoring and review; and communication and consultation within national customs administrations	
- an efficient and effective technique that stems from progress in science, technology, and management innovation	(Davaa and Namsrai 2015)
- predominantly viewed in the context of the application of an automated system to select high-risk transactions and determine the form and scope of customs control over them	(Komarov 2016)
- a systematic method associated with any activity or process in an organisation that enables to take advantage of opportunities and minimise potential losses - a proper mindset without which customs authorities cannot react to different situations and anticipate the necessary initiatives - a key measure contained in the WTO Trade Facilitation Agreement (TFA) - the systematic work of developing and implementing risk prevention and mitigation measures in practice - an effective way of handling flows involving large numbers of people, goods, and vehicles with limited resources and variable risks without disrupting the flow of legitimate trade	(Drobot et al. 2017)
- a fundamental principle of modern customs control methods, which allows optimum use of customs authorities' resources without reducing the effectiveness of customs controls and freeing most foreign trade operators from unnecessary bureaucratic controls	(Afanasieva et al. 2017)
- an interactive process in which information is continuously updated, analysed, and considered to implement preventive and corrective actions	(Drobot et al. 2017)
- worldwide concept to ensure the safety of people and goods - linked to any activity, function, or process in an organisation and will enable the organisation to seize opportunities and mitigate potential losses	(Anouche and Boumaaz 2019)
- coordinated risk management and control activities that help customs officials meet the challenges posed by limited resources	(Basir et al. 2019)
- a critical method of customs control principles	(Harmash 2019)
- coordinating risk management and control activities that help customs officials address the challenge of limited resources, increasing trade volumes and the need for fast clearance - preventing or reducing the likelihood of failure or unexpected consequences, as well as thinking creatively and using opportunities for effective information flow and staff collaboration - human, material, and financial resources and legal frameworks are managed to cope with cost and time constraints to achieve specific objectives	(Satyadini et al. 2020)
- a systematic action by customs authorities to reduce the likelihood of non-compliance events by international treaties and national customs legislation	(Abdurahmanov et al. 2020)
- coordinated actions to manage and control an organisation's risk	(Kim and Kim 2020)

Table 1. *Cont.*

Concept: Definitions of CRM	**References**
- a set of interrelated structures and management tools that ensure the analysis, identification, assessment, and mitigation of risks during customs controls - a source of further automated release of customs declarations - a source of further automated release of customs declarations - basis for the development of automatic release and automatic registration technologies	(Nemirova and Savelyeva 2020)
- an integrated approach to strengthen customs controls while encouraging economic operators' voluntary compliance and supporting improved trade competitiveness	(Azael Prerez Azcarraga and Juan 2022)
- effective risk management strategies highlight the symbiotic relationship between risk mitigation and sustainability	(Shubailat et al. 2024)

Table 2. Challenges related to CRM (Purpose).

Purpose: Aims and Objectives of CRM	**References**
- provide a sophisticated risk management method - facilitate trade by automatically and rationally selecting transactions and enhancing revenue performance - targeting of transactions for inspection for fear of losing revenue	(Geourjon and Laporte 2005)
- focus customs control activities and limited resources on specific risks	(Liu et al. 2009)
- determine which persons, goods, and means of transport are to be checked and to what extent	(Biljan and Trajkov 2012)
- limit risk exposure at strategic, operational, and tactical levels	(Biljan 2014)
- assess the effectiveness of the application and monitor the performance of client operations	(Drobot et al. 2017)
- the systematic identification of risk, including through spot checks, and the implementation of all measures to limit exposure to risk	(Afanasieva et al. 2017)
- identify and address the risks with the most significant impact	(Drobot et al. 2017)
- increase trade volumes and the need for fast clearance - assess risk and decide on the application of risk mitigation measures necessary for customs control - reduce overall risk and administrative barriers	(Basir et al. 2019)
- minimise trading interference and regulatory burden - the application of risk assessment techniques to know who is moving what, to whom, and from where - the introduction of the AEO programme to reduce security risks in the trade supply chain - protect public safety, domestic industry, and national sovereignty - categorisation to reduce the number of checks on law-abiding companies and to focus on those external economic operators who are exposed to infringements of the law - AEO for the convenience of traders, reducing the time and financial costs of moving goods across the customs border	(Satyadini et al. 2020)
- a powerful tool to balance between trade facilitation and revenue maximisation	(Al-Shbail 2020)
- the protection of society, culture, intellectual property, and the environment	(Kim and Kim 2020)
- improve operations and decision-making and reduce the impact of risk events on operational activities	(Frikha and Mraihi 2020)
- increase the efficiency of the implementation of customs control forms - reduce the burden on customs officials, allowing them to focus their efforts on the riskiest supplies	(Nemirova and Savelyeva 2020)

Table 2. *Cont.*

	Purpose: Aims and Objectives of CRM	**References**
-	collecting data and information, analysing and assessing risk, making recommendations and initiating action, and regularly monitoring and reviewing the process and its results	(Laszuk and Šramková 2021)
-	key indicators must be established for analysis to monitor results and overall performance of customs against its operational and strategic objectives	(Azael Prerez Azcarraga and Juan 2022)
-	identify suspicious imported goods	(Jeong et al. 2022)
-	intelligence supports with the information to develop warning systems	(Ylönen and Aven 2023)

Drobot et al. (2017) define risk management as a logical and systematic method of identifying, analysing, and managing risk and associating this management with any activity or process in an organisation, taking advantage of and minimising potential losses. Afanasieva et al. (2017) identify risk management as "a key principle of modern customs control methods", allowing for diminishing the administrative burdens of the controls, while Harmash (2019) sees a risk management system as "a key method of customs control principles". Drobot et al. (2017) describe risk management as an interactive process where information management is crucial in implementing preventive and corrective actions. They emphasise intelligence-enhanced risk management that combines the information and knowledge acquired by customs services to systematically identify and analyse the risks. Anouche and Boumaaz (2019) conceptualise risk management as attracting the attention of managers and organisations worldwide to ensure the safety of people and goods. They link the concept to any activity, function, or process in an organisation, enabling the capture of opportunities and the mitigation of potential losses. Basir et al. (2019) underline the coordinated risk management and control activities for helping customs authorities meet the challenges posed by limited resources, increasing trade volumes and the need for fast clearance. They design risk management to assess risk and decide on applying risk mitigation measures necessary for customs control. They also emphasise the importance of a holistic approach to reduce the overall risk in organisations and reduce administrative barriers during customs clearance for companies that always comply with customs regulations.

The remarkable contribution of Satyadini et al. (2020) frames risk management and proposes a technological approach in CRM by emphasising the role of artificial intelligence (AI) in processing the relevant customs procedures. They stress that the CRM system needs to be dynamically improved to keep pace with changes in the global value chain. Thus, risk management should cover not only preventing or reducing the likelihood of failure or unexpected consequences but also creative thinking and using opportunities for adequate information flow and staff collaboration. Accordingly, a well-defined and structured risk management framework should be implemented to minimise trading interference and regulatory burden. In addition, risk assessment techniques should be used to know who is moving what, to whom, and from where (Satyadini et al. 2020). The AEO programme is recognised as one of the highest-level policy decisions and attitudes of the risk-owner to reduce security risks in the trade supply chain. As the organisational goal of CRM is to protect public safety, domestic industry, and national sovereignty, the methodologies supporting this goal must be flexible and adaptable and take into account changes in the operating environment at both national and international levels (Satyadini et al. 2020). Satyadini et al. (2020) indicate that categorisation in CRM helps to enhance efficiency, e.g., reduce the number of checks on law-abiding companies to focus on those external economic operators exposed to law infringements. Establishing AEO is a further step to ensure that a category of persons who enjoy the confidence of the customs authorities can benefit from simplified customs controls. They also indicate the motivational arguments towards AEO, which directly affects the acceleration of trade and industrial potential development and the strengthening of the regional economy.

Describing CRM as a process, Abdurahmanov et al. (2020) relate it to a systematic action by customs authorities to reduce the likelihood of non-compliance events by international treaties and national customs legislation. Kim and Kim (2020) see it as coordinated actions to manage and control an organisation concerning risk, aiming for responsible modern customs services to protect society, culture, intellectual property, and the environment. Frikha and Mraihi (2020) underline the identification, analysis, assessment, and treatment of risks in the way that these customs activities significantly improve operations and decision-making and reduce the impact of risk events on operational activities. Nemirova and Savelyeva (2020) define CRM as a set of interrelated structures and management tools that ensure the analysis, identification, assessment, and mitigation of risks during customs controls. Thus, in line with customs practice, CRM is a source of the further automated release of customs declarations, which reduces information costs for service users and increases the efficiency of the implementation of customs control forms. They also describe CRM as a system that is the basis for the development of automatic release and automatic registration technologies because automated decision-making significantly reduces the burden on customs officials, allowing them to focus their efforts on the riskiest supplies. Laszuk and Šramková (2021) point out the significance of EU legislation to apply risk management in collecting data and information, analysing and assessing risk, making recommendations and initiating action, and regularly monitoring and reviewing the process and its results based on international, EU, and national law. The vital contribution of Azael Prerez Azcarraga and Juan (2022) strives towards an integrated risk management approach, which requires changes in mindsets, improved coordination, and performance monitoring. Ylönen and Aven (2023) emphasise intelligence tools to support risk management as they warn of potential threats despite high uncertainty. They indicate that this support provides valuable information for developing appropriate warning systems, an essential part of risk management strategies. Brown and Chew (1999) describe risk management strategies comprehensively. A risk management system has to identify suspicious imported goods (Jeong et al. 2022). Concluding here with the main findings of the performed content analysis, we found it helpful to refer to Shubailat et al. (2024), as they address the effective risk management strategies that have a positive impact on sustainable supply chain initiatives, highlighting the symbiotic relationship between risk mitigation and sustainability.

Based on the conducted content analysis of CRM challenges, we also identified the impact of CRM on the organisation's internal and external environments. We described this impact to understand why effective CRM is needed and where and how it is used. We summarise the findings in Tables 3 and 4.

Table 3. Impact of CRM on organisation's internal environment.

Rationale
focus limited resources on specific risks
limited risk exposure at strategic, operational, and tactical levels
implemented measures to limit exposure to risk
improved coordination, helping customs officials to solve problems
reduced the overall level of risk
assisted customs officials in addressing the problem of limited resources
dynamically upgraded to keep pace with changes
prevented or reduced the likelihood of failures or unexpected outcomes
improved operations and decision-making and reduced the impact of risk events on operational activities
provided flexibility and adaptability to changes
increased efficiency of customs controls

Table 3. *Cont.*

Application
systematic method associated with any activity or process in an organisation enabling to take advantage of opportunities and minimise potential losses
proper mindset for customs authorities to react to different situations and anticipate the necessary initiatives
allows optimum use of customs authorities' resources without reducing the effectiveness of customs controls
interactive process for preventive and corrective action
combine the information and knowledge acquired by the customs services with a systematic approach to identify and address the risks with the most significant impact
decision-making on the application of risk mitigation measures necessary for customs control
harnessing creative thinking and opportunities for effective information flow and staff collaboration
a source of further automated release of customs declarations to increase the efficiency of the implementation of customs control forms
basis for the development of automatic release and automatic registration technologies
automated decision-making significantly reduces the burden on customs officials
intelligence as a risk management support tool, providing warnings of potential threats despite high uncertainty

Table 4. Impact of CRM on organisation's external environment.

Rationale
a clear understanding of the nature of the risks
an effective way of handling flows involving large numbers of people, goods, and vehicles with limited resources and variable risks without disrupting the flow of legitimate trade
freeing most foreign trade operators from unnecessary bureaucratic controls
reduced administrative barriers for companies that always comply with customs rules
assistance to address the problem of increasing trade volumes and the need for fast clearance
reduced interference in trade transactions and regulatory burden
provided knowledge of who moves what, to whom, and from where
reduced costs for consumers
identified suspicious imported goods
a positive impact on sustainable supply chain initiatives
assistance to reduce the number of checks on law-abiding companies and to focus on those external economic operators who are exposed to infringements of the law
Application
a concept to ensure the safety of people and goods
AEO programmes to reduce security risks in the trade supply chain
protection of society, culture, intellectual property, and the environment
securing public safety, domestic industry, and national sovereignty
effective strategies have a positive impact on sustainable supply chain initiatives

Assessing the impact of CRM on an organisation's internal and external environments, we conclude that its effectiveness benefits the customs organisations, enterprises, and society as a whole.

CRM enables the customs authorities to use the limited resources at their disposal as efficiently as possible by selecting high-risk goods and means of transport for control. CRM is necessary to enable customs services to protect the EU against unfair and illegal

trade while supporting legitimate transactions. Through effective CRM, customs authorities should be able to distinguish between law-abiding traders to make border crossing and clearance as easy as possible for such traders, including through the introduction of automated clearance. CRM is not just a process within an organisation; it is a way of thinking that helps organisations solve different problems and achieve their objectives. It helps to understand the nature of the risks clearly. Effective CRM involves the systematic implementation of procedures: risk identification, risk assessment (including risk analysis and risk evaluation), risk treatment, monitoring and review, as well as communication and consultation within national customs administrations. Summarising the meta-analysis, we see the updated CRM process when integrating the effective risk management strategies to positively enhance sustainability actions and relate risk mitigation initiatives with sustainability measures.

4. Discussion

In general, the results of the performed literature review respond to what constitutes an effective CRM and its vitality and show its diverse assessment of the research community. A body of research has grown within traditional risk management thinking that supports using risk-based thinking in institutional reforms, considering the requirements of international standards. Several studies have documented the administrative and legal framework for risk management. WTO has defined the facilitation of international trade as a critical element of global economic development aimed at reducing administrative barriers to the movement of goods across national borders, including by simplifying the processes involved in clearing goods. Trade facilitation makes trade transactions more accessible, faster, more efficient, and cheaper, thereby facilitating trade flows, for instance, according to the study by Bhero and Hoffman (2017). Trade facilitation increases a country's attractiveness for foreign direct investment by making exporting and importing goods and services easier. Trade facilitation can have great potential for a country's economic development (UNECE 2023). Public authorities benefit from the improved collection of taxes, better use of resources, and greater compliance by traders. More efficient and transparent public service delivery will allow the administration to maintain a high level of security and effective control functions while reducing opportunities for corruption. In turn, traders involved in international trade will become more competitive thanks to greater transparency, faster transactions, and lower transaction costs. Speeding up procedures and reducing costs attracts investment and supports growth and job creation. Trade facilitation measures are costly for countries to implement and require a cautious approach to ensure that they benefit from a fair business environment while not jeopardising the other essential functions of public authorities.

International trade facilitation measures are often closely linked to the tasks of customs administrations. Customs is one of the key players in trade facilitation from a global supply chain perspective. For this reason, almost all national customs administrations must ensure a balance between customs controls at the border and the facilitation of legitimate trade, which is not easy to achieve in practice since the protection of the financial interests of the State, as well as ensuring safety and security, requires customs administrations to intervene in the processes involved in the movement of goods across borders (UNECE 2023). Such intervention impacts the time required for border crossing and customs formalities and the costs associated with customs controls and customs administration services.

Increasing trade volumes pose challenges and risks for customs in balancing trade facilitation and strict border controls. Given the limited resources, a comprehensive physical verification of all import and export consignments takes a lot of work. To ensure a balance between control and facilitation, the Revised Kyoto Convention (RKC) and the WTO's Trade Facilitation Agreement (TFA) explicitly require the implementation of an effective risk management system (Regmi and Timalsina 2018). Regarding simplification and harmonisation of customs procedures, the RKC identifies risk management as one of the critical principles of trade facilitation (WCO 2008). The RKC also sets out some

common risk management approaches, defined as the application of customs controls and outlined in the standard. The methodology set out in the RKC Review Report establishes a common framework. However, its framework is flexible to suit the unique circumstances of each country. De Wulf and Sokol (2004) have pointed out that "risk management involves a systematic system of risk assessment, profiling and selectivity, intelligence gathering and analysis, and has suggested that this system can help customs focus on high-risk multiple activities such as cargo, traders as well as passengers while maintaining effective and efficient controls at all stages of customs clearance". It is evident from the literature review that the systems approach in information processing and intelligence drives today's CRM. Thus, CRM manages customs policies, procedures, and practices with the necessary information and intelligence to identify, analyse, monitor, and address the risks of imported consignments (WCO 2008; Sreya 2020).

In general, the rationality of risk management has been emphasised by many scholars. Gates (2006) has identified the benefits of introducing risk management: more information about risks at the company level, more precise risk terminology, potentially more significant quantification of risks, reduced risk of non-compliance, and increased employee awareness and accountability. It is further mentioned that according to Kleffner et al. (2003), scholars argue that holistic risk management across the enterprise reduces the overall level of risk and creates a culture of vigilant risk monitoring within the organisation. Arguing towards CRM benefits, it is also noted that successful risk management programmes help companies to operate more smoothly and efficiently in a turbulent business environment (Satyadini et al. 2020). The results also demonstrate the strong belief of the customs authorities that risk management is a crucial methodology to simultaneously improve customs control and security on the one hand and trade facilitation on the other. In addition, a partnership-oriented relationship with the private sector and a good reputation for predictable and rapid service delivery can significantly impact a country's competitiveness and attractiveness for foreign direct investment (Ylönen and Aven 2023).

According to Satyadini et al. (2020) in line with Varese and Ronco (2019), Widdowson (2020), Razumei et al. (2023), and Van Trang et al. (2023), the legal framework for risk management should be based on flexible and tailored solutions to be implemented, with both government and the trading community taking responsibility for compliance, in contrast to the traditional style of governance that relied solely on the trading community. It is further argued that, according to Sparrow (2000), the administrative framework for risk management should be dependent on and appropriate to the level of risk and should focus on post-transaction compliance assessment, including effective redress mechanisms, particularly in high-risk areas, and vice versa. Furthermore, according to Chapman and Ward (2003), the key issues to consider are how to ask what needs to be done, how, when, and who will do it, and what the costs will be. Accordingly, Morris and Hough (1987) argued the importance of setting clear objectives for implementing organisational risk management systems. It should be addressed as a best practice for organisations to focus on the interests of their organisations and their employees through well-developed policies, standards, procedures, and plans (Satyadini et al. 2020). Hou and other scholars elaborate on teaching and training techniques in CRM (Hou 2011, 2015; Hou et al. 2011; Hou and Zeng 2013), Kalmykova et al. (2018) and their impact on the personnel management system. Customs services must keep pace with modern trends in improving public governance by modernising their management structure and organisation, considering national and international trade and customs rules, and developing information and communication technologies (Biljan 2014). The introduction of technology is also a pillar of risk management, not only for the efficient clearance of all goods (Regmi and Timalsina 2018) but also for the most effective way of achieving the objectives of the customs service (Fedotov and Zotenko 2020).

Customs and border control are undergoing significant changes, driven by geopolitical developments, the increasing flow of goods, and the development of new technologies such as digitalisation and AI tools. These changes create new sources of risk, such as cybercrime,

and new opportunities for more effective intelligence and risk analysis, particularly in identifying and detecting sources of risk. AI is becoming increasingly popular in the literature because it involves advanced technology platforms capable of dealing with complex situations characterised by uncertainty and ambiguity. López-Robles et al. (2019) underline AI, which is considered for collecting, analysing, interpreting, and disseminating high-value data, to be used promptly in decision-making. AI constitutes a framework for action and research for organisations that seek to improve their competitiveness by using high-value data in risk management. It is also mentioned by Fan et al. (2017), who highlighted that risk control and management solutions based on AI analytical techniques are seen as resources and capabilities which should be developed and maintained at the risk management framework level, sharing the costs and benefits of such assets. Risk assessment, control, and management are based on data and information. This information should be shared with actors in the supply chain (or commercial processes more broadly), then analysed to assess the actors' risk, and finally used to make a risk management decision (Satyadini et al. 2020). Similarly, Žigienė et al. (2019) proposed that cognitive analysis or AI helps to integrate complex big data to indicate and integrate known and initially unknown risk factors to process big business data, identifying risk factors in commercial processes. The assumptions behind the use of AI are to increase computers' computing power and preserve data storage.

Potential developments in CRM have been identified in the literature review. As we have already pointed out, CRM and related issues have yet to be extensively studied by scholars and reflected in scientific publications. Even fewer publications explore the methodology (Zahra and Said 2014) and development options for CRM. Several scholars highlight the use of information technology, including AI, in CRM (Yaquin and Song 2010; Drobot et al. 2017; Liu et al. 2009; Guangce 2012; Duan 2013; Liu et al. 2014; Liao 2017; Giordani 2018; Regmi and Timalsina 2018; McDaniel and Norberg 2019; Pourakbar and Zuidwijk 2018; Sorokin and Sorokin 2019; Kim and Kim 2020; Saidov et al. 2021; and Kuo and Chou 2021). At the same time, they stress that developing ICT requires appropriate tools, emphasising employees (Drobot et al. 2017). According to Jeong et al. (2022), despite the enthusiasm for the use of data and the opportunities offered by AI, adopting new technologies in the customs sector could be faster. The main reason is the need for more publicly available data. AI is making significant advances in many areas, and a high-quality dataset is essential for a good AI model. Hence, Jeong et al. (2022) demonstrate the feasibility of processing datasets of customs import declaration using artificially generated data in their publication.

Hofman et al. (2021) provide a detailed case study on linking customs and business data, assessing their data quality and value in the context of data requirements, and developing an evaluation framework for evaluating the quality and value of linked datasets. The authors propose to use this framework as a support tool for customs experts (at national and international levels) involved in customs data analysis. The proposed framework allows for a drill-down to provide a detailed insight into what data can be found in specific business data sources and how they complement existing customs data. Anouche and Boumaaz (2019) describe a predictive approach using big data, highlighting that the benefits of introducing such practices in a customs context would improve the efficiency and effectiveness of customs risk analysis systems. Big data methods are widely used in customs administration in countries such as the US, Canada, New Zealand, and the UK. Another method used in risk management is the development of matrices that provide consistent risk assessments across processes and facilities to facilitate consistent risk reduction decision-making and provide a rational basis for aggregating risk reduction recommendations into a centralised database for prioritisation and management (Baybutt 2018). Afanasieva et al. (2017) focus on the principles and methods of risk management and their implications for simplifying customs procedures through risk-based thinking. The article discusses the challenges of applying and implementing modern risk management methods in customs work, considering the requirements of international standards based on risk-based thinking.

According to Ylönen and Aven (2023), intelligence and risk assessment are crucial activities in customs and border control operations and a prerequisite for the success of customs and border control agencies currently. However, these activities are often carried out separately, although many functions overlap. Both areas address severe threats and risks and use many similar analytical approaches. There are differences in tradition, education, science, and practice between intelligence and risk assessment. Hence, Ylönen and Aven (2023) offer the perspective of integrating intelligence and risk management as a further option for developing a CRM framework. Finally, the development perspective of CRM reveals cooperation with customers, providing incentives for traders, passengers, or stakeholders to comply with the rules and putting in place a reliable enforcement regime that detects and punishes non-compliance efficiently and effectively (Basir et al. 2019). In other words, by influencing customer behaviour and steering them towards low-risk levels, customs authorities can focus more on high-risk control resources.

Scholars have shared divergent views on the effectiveness of risk management. Among the common opinions, the following can be noted. There is a consensus on the role of risk management in customs operations, emphasising its importance in improving customs control, security, and trade facilitation (De Wulf and Sokol 2004; Gates 2006; Kleffner et al. 2003; Satyadini et al. 2020; Ylönen and Aven 2023). Scholars advocate a holistic approach to risk management, emphasising systematic risk assessment, profiling, and information gathering and analysis (De Wulf and Sokol 2004; Kleffner et al. 2003; Afanasieva et al. 2017). The integration of information processing, ICT, and AI in CRM is considered essential to increase efficiency and effectiveness (Regmi and Timalsina 2018; Fedotov and Zotenko 2020; López-Robles et al. 2019; Jeong et al. 2022). There is a shared belief in the importance of cooperation between customs authorities and the private sector, with both parties taking responsibility for compliance (Satyadini et al. 2020; Varese and Ronco 2019; Widdowson 2020). Effective CRM has been recognised as facilitating trade, reducing administrative barriers, and making a country more attractive for foreign direct investment (Ylönen and Aven 2023).

Different perspectives were also highlighted in the scientific articles on CRM. While some scholars argue for flexible and tailored regulatory frameworks for risk management to suit different national contexts (Satyadini et al. 2020), others stress the need for standardised international frameworks (RKC and WTO TFA). While many scholars highlight the importance of AI and big data in CRM (López-Robles et al. 2019; Žigienė et al. 2019), there is a view that adoption can be slow due to data availability challenges (Jeong et al. 2022). Sparrow (2000) emphasises that risk management systems should be risk-dependent and focus on post-transaction compliance, while other scholars suggest a broader approach, including different stages of the customs process (Chapman and Ward 2003; Morris and Hough 1987). Ylönen and Aven (2023) propose integrating intelligence and risk management functions, often mentioned as separate areas by other scholars. Hou and colleagues focus on the importance of teaching and training methods in CRM (Hou et al. 2011; Hou and Zeng 2013), while others do not emphasise this aspect as strongly, instead focusing more on technological and procedural improvements.

The academic papers reflect a broad consensus on the role and benefits of CRM, highlighting its role in improving security, facilitating trade, and promoting cooperation between public authorities and the private sector. However, there are different views on the flexibility of the regulatory framework, the pace of technology adoption, the focus of administrative frameworks, the integration of intelligence and risk management, and the emphasis on staff training. These differences highlight the complexity and multifaceted nature of effective CRM practices.

Implemented risk management practices should streamline customs procedures, reduce administrative barriers, and increase the country's attractiveness for foreign direct investment. Reviewing and revising customs procedures to eliminate unnecessary steps is essential, facilitating faster and more efficient trade processing. The promotion of these improvements will attract foreign direct investment. A flexible regulatory framework

will help adapt to different national circumstances while maintaining basic standards and requirements. Flexible policies will allow adaptation to local needs while aligning with international standards where possible. Ongoing dialogue with stakeholders is needed to ensure that the rules remain relevant and effective. The adoption of AI and big data analytics must be accelerated despite data availability challenges. Solutions to the data availability problem should be sought by improving data collection methods and working with other agencies and the private sector on data sharing. Investment in infrastructure to support the use of advanced technologies is also necessary.

To ensure comprehensive risk management, there is a need to balance the focus between post-transaction compliance and other stages of the customs process. Policies should be developed that cover risk management at several stages of the customs process, including all stages of transactions. Monitoring and evaluation systems should be put in place to track its effectiveness. The integration of intelligence and risk management functions will enhance the improvement of overall efficiency. Integrated units should be set up within customs administrations that combine intelligence and risk management functions. Staff training in both areas would be vital to ensure coordinated actions. Attention should be paid to rigorous training and adaptation programmes for customs officials to ensure they are prepared to work with modern CRM practices. Comprehensive training programmes covering both technological tools and procedural knowledge should be developed. Continuous professional development initiatives should be established to keep staff up-to-date with the latest practices and technologies.

By addressing common and divergent views practically and systematically, customs administrations can improve their risk management capabilities, thereby improving security, facilitating trade, and delivering economic benefits.

5. Conclusions

In this article, we explored the contemporary challenges in CRM, how these are addressed in the scientific literature, and the opportunities to develop the effective management of customs risks. Therefore, we performed a systematic literature review, which, to our knowledge, is the first review that has systematically reviewed and analysed the scientific literature on CRM. The studies included in the review represent different countries, behaviours, approaches, methodologies, and technologies. Based on the literature review, we conducted a content analysis. Then, we consolidated and discussed the knowledge from the scientific literature that allowed us to identify significant factors contributing to effectiveness in CRM. Advanced visualisation tools would allow the creation of bibliometric and citation maps that visualise co-citation networks, the temporal evolution of research topics, and collaboration between authors and institutions.

To provide both the quality of the services provided by customs and compliance with the requirements within a resource-constrained framework, the customs services need to continuously streamline their working methods, including by seeking a more structured and systematic way of managing customs risks, especially if considering so-called wicked problems (Head 2022), which helps to understand and respond to complex challenges, e.g., pandemic threats, risks of disinformation and hybrid warfare, sanctions on the movement of goods, etc.

Although CRM and related issues are not topics that scholars have extensively studied, there has been a growing research interest in recent years. Our study shows that CRM positively impacts both the internal and external elements of the organisation's environment. The benefits of effective CRM arise for the organisation, the business, and society. Currently, a CRM should be understood and improved adequately as it covers more than just a process within an organisation. It is a way of thinking that helps organisations solve diverse problems and achieve their objectives. Based on the literature review, we acknowledged that effective CRM is essential for successfully performing customs tasks and achieving the goals set for customs, including ensuring countries' economic and security interests and facilitating international trade.

A comparatively small number of publications explore the methodology and set of techniques for CRM from the effectiveness point of view. The literature review also shows the research gap regarding cooperation between customs organisations and agencies, e.g., border control, law enforcement, national and international customs authorities and services, and its impacts on CRM.

Several key areas can be focused on to effectively apply the insights from scholars on CRM in practice and address the changes necessary in CRM policies and procedures. Shared and divergent views can be integrated into practical use to make the required changes that might be needed. Customs administrations should prioritise risk management as a central component of their operations. This involves regular risk assessments, profiling, and intelligence analysis to enhance security and facilitate trade. Policies should be updated to mandate systematic risk management practices and allocate resources specifically for risk management activities. Adopting a holistic approach would mean integrating risk assessment, profiling, information gathering, and analysis into all stages of customs operations. When developing a comprehensive risk management system, it should cover all customs processes. Training programmes and standard operating procedures must be developed to ensure consistent application. The use of ICT and AI would help to process and analyse data more efficiently, improving the accuracy and speed of risk assessments. Developing the use of ICT and AI in CRM would require investments in modern ICT infrastructure and AI technologies. It is essential to update policies to support the integration of these technologies and provide staff training in their effective use. To share responsibility for compliance and improve overall risk management, it is essential (1) to strengthen the partnership between customs authorities and the private sector, (2) to develop policies that promote and formalise public–private partnerships, and (3) to implement joint compliance programmes and information sharing agreements.

From this study, we outline several perspectives on the development of CRM for further research. First, we encourage extending the use of information technologies, including AI, in CRM. Second, we recommend linking customs and business data and their use in risk analysis and using big data techniques in CRM. Third, we urge researchers to develop CRM methods for assessing the potential integration of intelligence and risk management. Fourth, we suggest developing the applicable indicators and contributing to the methodology for evaluating customs risks. Lastly, we encourage the promotion of beneficial cooperation with customers of customs services to gain necessary feedback for further improvements in CRM.

Exploring essential development trends in the field of CRM, the research outcome acknowledges the importance of ICT and AI for effective CRM in facing globalisation and economic integration processes. We believe that the research findings will encourage further research because they relate to interdisciplinary subject areas and contribute to safe international trade, reliability, and quality issues, providing a focal point for new developments in the field of risk management and sustainable finance practices, e.g., risk frameworks, integration processes, institutional variety, communication, and decision-making.

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Adapting to Multipolarity: Insights from Iterated Game Theory Simulations—A Preliminary Study on Hypothetical Optimal Global Cooperation

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Abstract: The global geopolitical landscape is characterized by the rise of new powers and a shift toward multipolarity. This study examines the impact of multipolarity on international cooperation using an iterated game theory approach, particularly the classic prisoner's dilemma, extended to a multiplayer setting. This effort can be regarded as a preliminary study of hypothetical optimal global cooperation. The main hypothesis is that an increase in the number of large countries in the international system will lead to higher levels of cooperation. Our simulation approach confirmed this. Our findings extend to the conclusion that multipolarity, under appropriate cultural and value systems, can foster new economic development and fair competition. Furthermore, we emphasize the importance of evolving strategies and cooperative dynamics in a multipolar world, contributing to discussions on foreign economic policy integration, sustainability, and managing vulnerabilities among great powers. The study underscores the necessity of strategic frameworks and international institutions in promoting global stability and cooperation amidst the complexities of multipolarity.

Keywords: multipolarity; game theory; prisoner's dilemma; international relationships; trade; institutions; strategic thinking

1. Introduction

One of the main characteristics of the current global geopolitical landscape is the emergence and rise of new powers and deglobalization tendencies. Currently, the global geopolitical scene is characterized by (i) a pervasive climate of cooperation deficiency among major countries, (ii) increased prospects for major power wars in Europe and the Indo-Pacific, and (iii) increasing instability in the Middle East (Haas 2022). These conditions could create one of the most dangerous junctures since World War II (Haas 2022).

The world order built mainly by the United States after the end of the Second World War is experiencing extremely strong fluctuations in the dynamics between the West and East. This is largely due to the rise of other powerful actors in the international geopolitical scene (Zakaria 2008), such as China, which possesses an economic and political value portfolio that diverges significantly from that of the United States. Such a portfolio could change the economic and political constants of the world, as we know today.

There is, therefore, a crisis between the West and the East (United States and China) that can escalate and even take the form of armed conflict, as evidenced by events in Taiwan that lie at the heart of American–Chinese tensions.

In general, the financial crisis of 2008, the COVID-19 pandemic, and the energy crisis of 2022 collectively led to a broader shift towards protectionism and self-sufficiency, which reduced the degree of dependencies and interconnections, thus affecting delicate trade balances. The Ukrainian war deepened the tensions between Russia, the United States, and Europe, generating migrant flows and rising inflation (Kimmage and Notte 2023). Among other things, Russia's invasion of Ukraine strikes a blow against the concept of liberal

democracy, and thus, even though the United States is geographically "far away" from Ukraine, they are ideologically involved in defending liberal democracy.

Furthermore, in the Middle East, power and ideological multipolarity have been transposed onto a highly volatile landscape resulting from an unprecedented proliferation of weak or collapsing states (Kamrava 2018). According to Carlstrom (2024), the ongoing war between Israel and Palestine could be a turning point in the world order, revealing that the Middle East is neither unipolar nor multipolar, but nonpolar.

As a result, geopolitical settings are vulnerable to conflicts between states over the control of supply chains (AFOF Geopolitical 2020). Under these conditions, geopolitical risk is increased, as well as existential uncertainty and multipolarity (Gomart 2016).

The transition of the international system into multipolarity is a complex process, given the co-existence of regional identities, diverse interests, and cultures, as well as geopolitical morphology and historic ties. At the same time, our economies and societies are experiencing great connectivity due to technological advancements, cost reductions, and cultural globalization (Watson 2010). Such characteristics increase systematic complexity, leading to "new globalization", which is characterized by multipolarity in international relationships and an accelerated reproduction of structural crises and development prospects (Vlados et al. 2022). In other words, in a highly interconnected and multipolar world, a large-scale shock can spread rapidly, generating the snowball effect (Hulsman et al. 2010) and profoundly impacting the future.

These conditions require preparedness for the future (Hulsman et al. 2010). Adaptation to multipolarity is an effort to maintain economic security, but it does not necessarily fall into the domains of either traditional national security or free-market economics (Farrell and Newman 2023). Thus, it is of significant interest to consider the possible behaviors and sets of actions of states in a proper analytical framework. States, like individual players, have interests derived from their geographical positions, claims, and cultures. Over time, changes may occur in the borders of states as well as in their cultural identities. Such changes and rearrangements create winners, losers, stable equilibria, unstable equilibria, and equilibria of terror.

From an economic perspective, these relationships are akin to game theory exercises. According to Snidal (1985), the strategic analysis of international political relations through game theory raises important questions about the interdependence and relations of player states. However, this requires the use of complementary auxiliary hypotheses and a substantial study of the evolution of cooperation under certain circumstances. Hence, the game theory approach is not an explanatory solution but a strategic exercise to assess various adverse outcomes. The study of international relationships through game theory allows individuals to understand and analyze the outcomes of multipolarity and formulate new policies to ensure long-term stability and sustainability. Therefore, a game theory approach is in a position to generate informed decision making (Farson 2023).

Having said that, the present study employs iterated game theory simulations to model the interactions between countries of varying sizes and attributes. This analysis is based on a purely theoretical hypothesis regarding the competition and cooperation of a large number of de facto entities/countries participating in the evolution of the global economy. More specifically, we extend the classic prisoner's dilemma to an iterated multiplayer setting, in which countries repeatedly interact with one another over multiple rounds. For the simulations and computational analysis, we utilized the Wolfram Mathematica computational environment. The departure point of the analysis is the general idea that power distribution affects international relationships. This study is based on the hypothesis that a higher number of large countries in the international system will lead to increased levels of cooperation. That is, multipolarity itself does not rule out cooperation (Perskaya 2017). Our findings confirm this assumption.

The insights provided by the study suggest that large countries, with their significant economic and military capabilities, can play a stabilizing role in the international system by promoting cooperative behavior among states. Multipolarity can be viewed as a set of

economic and political conditions that can act as tools for forming new poles of economic development and fair competition under proper cultural and value systems (Perskaya 2017). These insights further contribute to the promotion of sustainability and de-risking of the process of managing vulnerabilities between great powers (Farrell and Newman 2023), specifically in the regional architecture of world politics (Garzón 2016). By the latter, it is understood that multipolarity does not rule out regionalization and the emergence of strategic interests (Perskaya 2017). Therefore, the present study contributes to the discussion on the beneficial integration of different parties in foreign economic policy as a strategic guideline for a favorable global economic future.

2. Theoretical Background: On the Evolution of Cooperation and Its Structural Features in International Relationships

A common question in both biology and social sciences concerns the foundations and emergence of cooperative behavior (Zhang and Pei 2022). Cooperation is common between members of the same species and even between members of different species (Axelrod 1984). In the biological sciences, the most important forms of cooperation are not based on kinship but on indirect reciprocity and spatial selection (Kornilakis 2023). For Dugatkin (1997), there are four paths for cooperation: (i) reciprocity, (ii) byproduct mutualism, (iii) kinship, and (iv) group selection.

Anthropologically, societies balance competitiveness, cooperativeness, and individualism, depending on their living circumstances (Mead 1937). The notions of culture and personality are the bridge between biological and social sciences, such as economics, because they depict different aspects of socialized human beings (Mead 1937). In economics, cooperative dynamics are complex because of the main and contradictory assumption that individuals are selfish (Axelrod 1984). However, cooperation is possible but requires social structure (Axelrod 1984). For example, in a society in which everyone acts selfishly, there is no ground for a tit-for-tat strategy. Selfishness is an interpretation of behavior obtained either through direct knowledge (perfect information) or secondhand experience. Labels in terms of behavior are observable, fixed characteristics of the players or the overall cultural structure that can influence behavior and lead to stereotypes (Axelrod 1984).

In addition to behavioral qualities and attributes, the time factor is also important in determining whether cooperation will take place. In a prisoner's dilemma game with predetermined turns, two rational individuals will never cooperate. On the other hand, in the iterated version of the game, cooperation, trust, strategic decision making, and adaptability could arise (Axelrod 1984). Successful social decision making depends on the ability to identify trustworthy interaction partners and evaluate time variables correctly (Evans and van de Calseyde 2017). For example, when one player makes quick decisions, the other player tends to make extreme decisions because fast decision makers are perceived as less moral, less conflicted, and extremely selfish (Evans and van de Calseyde 2017).

Applications of game theory, which address social phenomena and power dynamics, can depict the relationships between countries (Chiesi 2015). International relationships in a game theory framework concern the interplay between specific actors, including nation-states (Correa 2001). Game theory can assist the analysis of international relationships to acquire a comprehensive understanding of the evaluation and significance of complex cooperative dynamics in social and economic systems (Correa 2001; Kanzola 2023). In the case of nation-states as actors, the main assumption is that they are motivated by their own interests (Correa 2001). This is generally accurate, as national interests drive global alliances.

For instance, the liberalization of international trade can be modeled as a prisoner's dilemma, where all countries have a mutual economic interest in the advantages of free trade but also have motivations to safeguard their sensitive domestic industries (Krugman 1992). Trade liberalization is an iterative game that allows countries to respond to each other's past moves. According to Axelrod (1984), iterations of the prisoner's dilemma allow countries to adopt cooperation strategies, gradually and mutually opening their

markets and choosing to cooperate. Evolutionary approaches to game theory suggest that cooperation and defection follow each other in successive waves (Nowak and Sigmund 2004; Nowak 2006).

Subsequently, within the framework of evolutionary game theory, small groups employing cooperative tactics such as tit-for-tat can establish alliances within a population dominated by defectors. Once cooperation becomes prevalent in the population, a transition toward unconditional cooperation may occur, as tit-for-tat strategies do not penalize unconditional cooperation. However, when the entire population collaborates, unconditional defection becomes a favorable strategy, as it exploits the cooperative behavior of others. Consequently, this leads to an ongoing cycle in which the level of cooperation in a given population initially increases and then declines. Such an evolutionary model allows for a dynamic approach to international cooperation (Krapohl et al. 2021).

In the study of foreign affairs using game theory approaches, it is important to consider the presence of several powerful nation-states as well as the existence of powerful megatrends (Naisbitt 1988), which might encourage or discourage cooperation. For example, globalization defined economies during the Great Moderation (1980–2007) at the economic, political, and social levels and promoted world cooperation. It involved an international shift towards a global economic system not based on autonomous economies (Holm and Sorensen 1995; Godet et al. 1994).

Currently, we are gradually witnessing a de-globalization phenomenon that involves the weakening of international economic relations, economic protectionism, cultural backlash, and the rise of populism (Garg and Sushil 2021). According to Bello (2004), de-globalization is not about withdrawing from the international economy, but rather an emphasis on economies channeling their own exported products into the international market. The emergence of de-globalization requires an alternative system of international institutions and governance (Bello 2004). Such a shift in international economics creates significant uncertainty and affects international stability (Aftab and Phylaktis 2022). One of the greatest problems facing the current economic organization is the fact that neoliberalism has reached its limits (Peters 2022). Nevertheless, the future of capitalism, as we experience today, will be shaped by the influence of swinging factors of a social, political, and economic nature (Petrakis 2022). These forces will affect the future of capitalism through either unsustainable or transformed paths (Petrakis 2022).

Another important phenomenon is multipolarity, which refers to the balance and distribution of global power between more than two state powers. The concept essentially indicates that no global power has a direct and clear influence over other world powers (de Aguiar Patriota 2017), and theoretically, it partially aligns with the balance of power theory (Waltz 1979).

In a multipolar world with constant power shifts, there are competitive dynamics that can lead to armed conflict and instability (Allison 2017)[1]. According to the power transition theory, wars emerge as a result of a rising power surpassing the most powerful state at the moment (Goldstein and Pevehouse 2014). During these times, power distribution is relatively equal and the proximity to war is high (Goldstein and Pevehouse 2014). The emergence of multiple powers and player nation-states translates into multiple political agendas that may converge or diverge. When forces and agendas diverge, the phenomenon of geopolitical revisionism may arise whereby different powers seek to revise the existing status quo (Mead 2014).

The distribution of power among states has long influenced international relations. Theories such as realism and liberalism offer differing perspectives on whether a unipolar, bipolar, or multipolar world is conducive to peace and cooperation (Waltz 1979). For instance, realism posits that the international system is anarchic and that states must rely on self-help to ensure their survival (Morgenthau 1948). In contrast, liberalism emphasizes the role of international institutions and economic interdependence in promoting cooperation (Keohane 1984).

Power is always realized with the use of resources (Vuving 2009). The exercise of power can occur either through cultural and economic appeal (soft power) or in the form of forced actions such as military interventions (hard power) (Nye 2004). Soft power is the ability to affect the behavior of others by influencing their preferences (Vuving 2009). It can be a critical tool to navigate through complexity because it reduces the possibility of armed conflicts. Soft power concerns attracting someone to desire certain things or circumstances (Nye 2008). This definition in the context of the network economy signifies the possible emergence of strong networking relationships to achieve common agendas (Nye 2008). At the social level, networks satisfy the need for belonging (Moser and Ashforth 2022). At the economic level, networks are generated from hierarchies and refer to a concentration of interactive behaviors (Economides 1996). Even though networks do not emerge randomly, because they are founded under mutual interests, network operators (exercising hard or soft power) can opt for lock-in conditions to ensure stability (Kanzola 2023).

The importance of multipolarity in modern interconnected international relationships concerns its impact on the overall stability of the global system (Posen 2009). In addition to power distribution, the emerging multipolarity concerns the reconfiguration of a more diversified world in terms of social values and perceptions, which do not necessarily include the cultural values or practices of the West (Wang and Miao 2022). In multipolarity, the relations of the states are more complex and less predictable than when bipolarity prevails (Waltz 2000). Thus, a methodological framework such as game theory can offer interesting insights. Game theory for international relations analysis expands the rational actor model beyond the restrictive confines of the traditional realist perspective to a more complex world (Snidal 1985).

3. Methodology

In this study, we built on the foundations of evolutionary game theory, which has been extensively used in biology to study the emergence and stability of cooperative behavior among organisms (Nowak 2006).[2] The study of evolutionary games allows us to understand the emergence of cooperation in different contexts (Scatà et al. 2016). Specifically, inspired by Krapohl et al. (2021), we apply an evolutionary game theory approach for international trade in order to evaluate the impact of multipolarity on international cooperation. In general, evolutionary game theory models consist of two main components: (i) a game that is continuously played among all possible pairs of players, and (ii) a model of the evolutionary process where successful strategies are favored over unsuccessful ones. Owing to the large number of players and repeated interactions, it is impossible to predict the behavior of such models in advance. Consequently, computer simulations are necessary for their analysis.

This study focuses on two key hypotheses that explore the dynamics of international cooperation in a multipolar world.

H1. *The presence of multiple large powers (multipolarity) leads to higher levels of cooperation among states.*

H2. *The emergence of cycles of cooperation and competition reflects long-term cyclical patterns influenced by shifts in power, strategy evolution, and external conditions.*

It should be noted that our study models international relations under idealized conditions emphasizing the potential benefits of cooperation. However, the current global landscape often deviates from these theoretical scenarios. Major powers frequently engage in trade disputes, political tensions, and other confrontations, illustrating the complexity of international relations where strategic, economic, and security concerns lead to adversarial behavior instead of cooperation. Trade wars between the United States and China, geopolitical maneuvers by Russia, and regional conflicts involving Israel and India exemplify how real-world interactions diverge from the cooperative frameworks our model explores.

These deviations underscore the challenges of applying theoretical models to practical situations where competing national interests and power dynamics often supersede cooperation. Nevertheless, our model aims to explore scenarios where cooperation could be beneficial despite adversity. By highlighting the potential for cooperative strategies to yield mutual benefits, our study provides insights that could inform efforts to reduce conflict and foster negotiation, offering a theoretical basis for more stable and constructive international relations.

The following Figure 1 displays the conceptual map of the simulation.

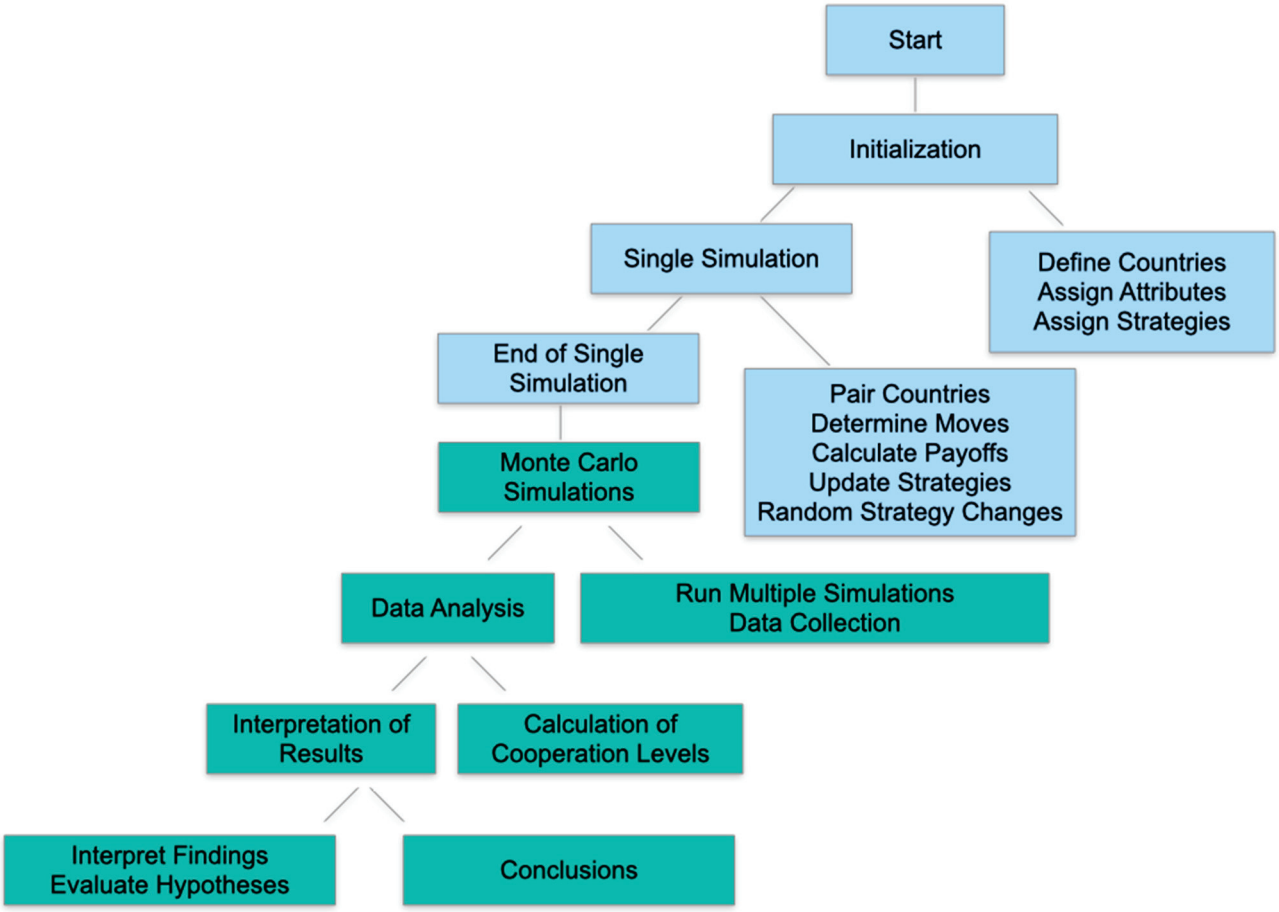


Figure 1. Flow chart of the simulation.

We extend the classic prisoner's dilemma to an iterated multiplayer setting. The simulation involves a total of 15 countries divided into three categories: large, medium, and small. The initial number of countries in each category can be adjusted, but it was chosen to reduce the complexity associated with scenario generation.

Real-world countries were categorized into the three aforementioned groups based on their gross domestic product (GDP). This categorization involved ranking countries by GDP and subsequently dividing them into these groups to reflect their relative economic size. This approach allows for the inclusion of a wide spectrum of countries within each group, facilitating a comprehensive analysis of diverse economic contexts.

- Large Countries: This group comprises the highest-ranking countries by GDP, such as the United States and China. These nations typically exert significant global influence and possess substantial economic power.
- Medium Countries: Countries in this category, such as Japan and Germany, have mid-range GDPs, indicating moderate economic power. These countries play crucial

roles in regional markets and often maintain substantial trade relationships with both larger and smaller economies.

- Small Countries: The small-country group includes nations with the lowest GDPs in the study, such as Norway and Argentina. These countries have smaller economies and may be more susceptible to external economic pressures, yet they often exhibit high levels of export dependency.

Random values within the range of three key indicators for each real-world country group were used as attributes for the countries in the simulation. The attributes were chosen following Krapohl et al. (2021). These attributes influence payoffs in the game, with specific benefits and costs associated with cooperation and defection. The attributes in question are as follows:

- The size (M) represents the economic power of a country. It reflects a country's GDP or economic output. Larger economies may have more resources to invest in cooperation and can derive greater benefits from stable international relations (Keohane 1984).
- The Export orientation (e) is calculated as the ratio of a country's exports to its GDP, representing the share of the export industry.
- The Barriers (i) refer to protectionist policies. They are measured by the weighted average tariff rates on imports, indicating the level of protection against foreign imports.

The specific value ranges for these indicators were derived from World Bank data (see Appendix A Table A1). The interactions between countries were modeled over 100 iterations, allowing us to observe the evolution of strategies and cooperation levels over time.

Table 1 depicts the country attributes and the range of values they take based on their size (small, medium, and large).

Table 1. Country attributes and range of values according to each of the three categories.

Size (M) (Current USD bn.)			Export Orientation (e) (% of GDP)			Barriers (i) (%)		
Small	**Medium**	**Large**	**Small**	**Medium**	**Large**	**Small**	**Medium**	**Large**
From 14 to 503	From 1650 to 5035	From 17,820 to 23,315	From 2.2 to 99.3	From 18.1 to 47.3	From 10.9 to 19.9	From 0 to 12.7	From 7 to 7.8	From 1.5 to 2.3

Each country adopts one of several strategies. The outcomes of these interactions are influenced by each country's attributes, which affect the payoffs received from cooperation or defection. The strategies used in our simulation are defined as follows:

- Always Defect: This strategy always chooses to defect regardless of the opponent's previous actions.
- Always Cooperate: This strategy always chooses to cooperate regardless of the opponent's previous actions.
- Tit-for-Tat: This strategy cooperates on the first move and then mimics the opponent's last move in subsequent rounds (Axelrod 1984). This has been shown to be effective in promoting cooperation during repeated interactions.
- Generous Tit-for-Tat: This strategy is similar to Tit-for-Tat, but includes a 25% chance of forgiving a defection by cooperating (Nowak and Sigmund 1993). This allows for the possibility of repairing damaged relationships and avoids retaliation cycles.

In the first round of the simulation, an initial strategy is randomly assigned to each country, with large countries being more likely to receive cooperative strategies. Table 2 presents the strategies alongside the randomly assigned attributes for the 15 countries included in the simulation. The values of these attributes are selected from within the ranges specified the Appendix A Table A1.

Table 2. Random assignment of initial country attributes.

Country	Category	Strategy	Size (M)	Export Orientation (e)	Barriers (i)
1	Small	Generous Tit-for-Tat	91.574	0.675	0.037
2	Large	Tit-for-Tat	18,394.005	0.112	0.025
3	Medium	Always Defect	2,562.558	0.413	0.052
4	Medium	Always Defect	3,438.514	0.331	0.024
5	Small	Always Cooperate	357.210	0.987	0.036
6	Small	Tit-for-Tat	34.012	0.771	0.007
7	Small	Tit-for-Tat	86.936	0.724	0.018
8	Medium	Always Cooperate	3,734.833	0.408	0.050
9	Small	Always Cooperate	92.504	0.743	0.049
10	Small	Tit-for-Tat	77.867	0.601	0.049
11	Small	Tit-for-Tat	347.261	0.980	0.049
12	Small	Tit-for-Tat	448.817	0.500	0.025
13	Medium	Always Defect	4,391.060	0.435	0.026
14	Small	Always Defect	457.881	0.499	0.027
15	Small	Always Cooperate	129.965	0.442	0.028

As mentioned, the countries repeatedly interacted with one another in pairs, all against all, over 100 rounds. Table 3 presents the payoff matrix between two potential Countries A and B.

Table 3. Payoff matrix.

		Country B	
		Cooperate	**Defect**
Country A	Cooperate	$e_a\ M_b - i_a\ e_b\ M_b$	$-i_a\ e_b\ M_b$
		$e_b\ M_a - i_b\ e_a\ M_a$	$e_b\ M_a$
	Defect	$e_a\ M_b$	0
		$-i_b\ e_a\ M_a$	0

The benefits and costs associated with cooperation and defection and the payoffs for each interaction were calculated based on the moves of the two countries. The cumulative gains of each country were used as a measure of the success of each strategy. Thus, the most successful countries are more likely to find imitators in their strategies. As a measure of success, we consider the gains or losses from interacting with other countries. The gains are not constant for all players, as in simpler models, but depend on the characteristics of each pair of countries.

Essentially, the potential benefits that Country A may gain from establishing a mutual cooperative relationship with Country B are defined as follows:

$$e_a\ M_b - i_a\ e_b\ M_b$$

If Country A cooperates while Country B defects, Country A incurs a cost equal to $(-i_a\ e_b\ M_b)$ and Country B gains benefits equal to $(e_a\ M_b)$ from the interaction. In this game, after each round, a country is selected to reproduce its strategy with the probability of selection corresponding to its relative success. This is achieved using the current cumulative gains as weights. Subsequently, another country is randomly chosen to adopt the strategy of

the successful country. A country's success is determined by the total returns it accumulates through interactions with every other country during each game round.

Success is defined as the advantage a country gains from access to international markets minus the costs associated with opening its domestic market. In the prisoner's dilemma of trade liberalization, a country's export industry benefits from increased profits due to comparative cost advantages and economies of scale as it gains greater market access. Conversely, as a country opens its domestic market for imports, its protected industries face negative impacts from heightened competition. To achieve a successful strategy, a country must maximize its market access in each round of the repeated prisoner's dilemma game while simultaneously minimizing the costs associated with trade liberalization.

For the analysis, we developed a single simulation methodology and then included it in a Monte Carlo simulation. For the simulations and computational analysis, we utilized the Wolfram Mathematica computational environment.

3.1. Single Simulation

In a single simulation, each country interacts with every other country in each round. The decisions to cooperate or defect are determined by the countries' strategies, which can be influenced by past interactions. The payoffs for each interaction are calculated based on the countries' attributes and the outcomes of the interactions. The results of each round were recorded, and the cooperation levels were tracked throughout the iterations. The simulation flow is as follows.

1. Initialization: Random strategies and attributes are assigned to each country based on their size categories (see Appendix A). The initial allocation of strategies and attributes among countries in the model reflects the diverse and unpredictable nature of international relations. By starting with random strategies and economic attributes, we avoid introducing any bias and allow the model to explore how different approaches evolve naturally over time. Importantly, the randomness was balanced through 100 iterations within each simulation and 100 single simulations. This extensive repetition ensures that the outcomes reflect underlying patterns and trends rather than just the initial randomness, providing robust insights into the dynamics of international cooperation.
2. Iterations: Each country pairs with every other country, resulting in 105 interactions per round. In each interaction, countries choose their moves based on their strategies and the history of previous interactions. The payoffs are calculated by taking into account each country's size, export gains, and barrier costs.
3. Adjustment of strategies: A country is selected based on cumulative gains to potentially influence the strategy of another country. This captures the diffusion of information and the ability of countries to monitor what is happening in the international economic and political scene and adjust their policies accordingly. Note that an additional random strategy change occurs with a 10% probability. This represents random events and/or non-rational behaviors that may influence policy decisions in an unexpected way.
4. Measurements: The measurements were performed as follows:
    - Level of cooperation: Percentage of cooperative moves in each round.
    - Distribution of strategies: Frequency of each strategy across iterations.
    - Cumulative gains: Recorded for each country.

Figure 2 depicts the cooperation level and strategy distribution over 100 iterations.

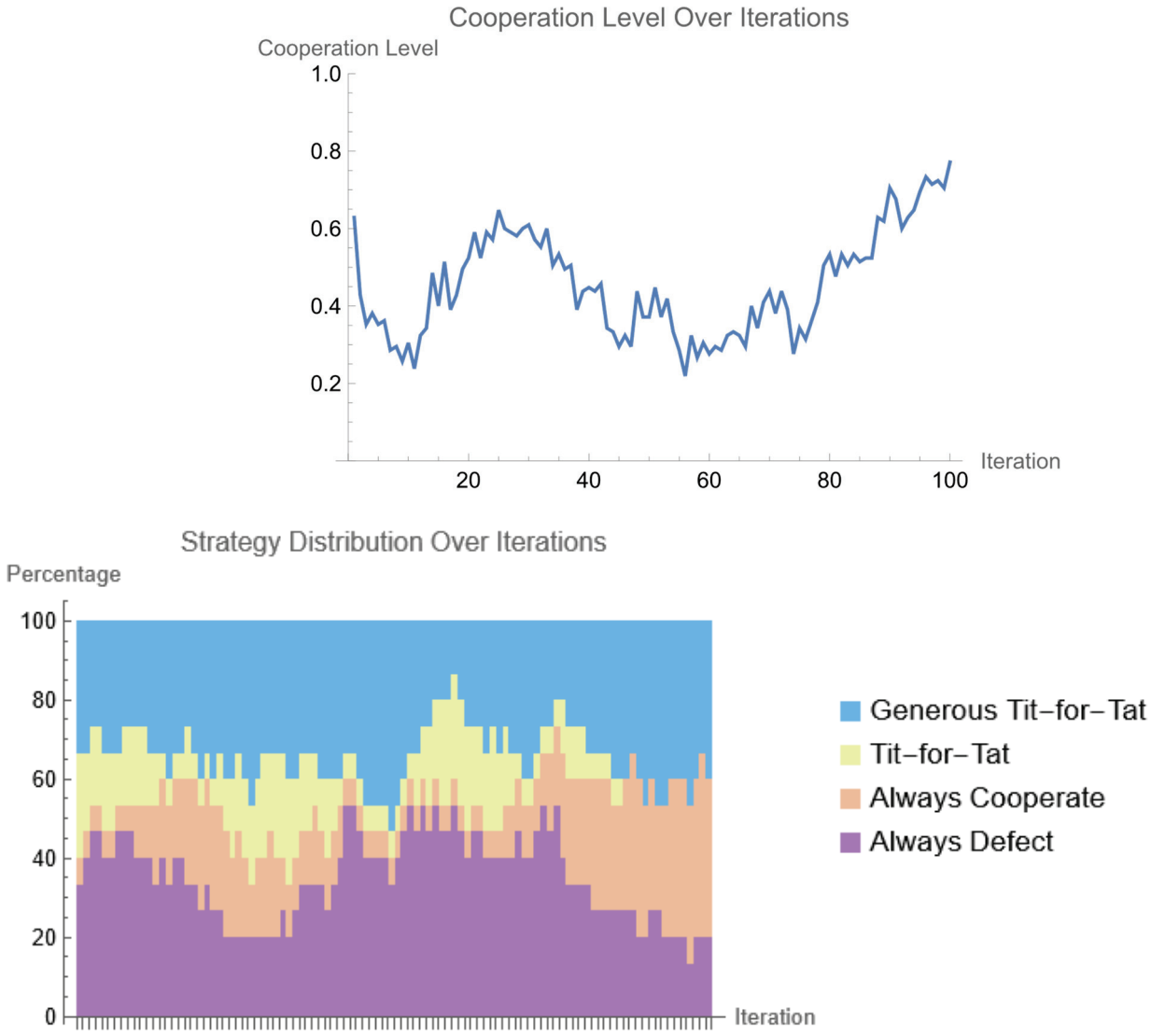


Figure 2. Cooperation level and strategy distribution over 100 iterations.

Cooperation levels are dynamic in nature and vary significantly over time. This is attributed to the fact that the players' strategies are adapting in response to the actions of other players. In the last round, we observed a slight increase in cooperation, suggesting a possible stabilization or adaptation towards more cooperative strategies. We notice that the Always Defect strategy is dominant at the beginning of the game, while the Generous Tit-for-Tat and Tit-for-Tat strategies increase towards the end, indicating that they are more successful in the long run. The Always Cooperate strategy shows an intermittent presence, implying that while cooperation can be beneficial, it may not always be the dominant strategy, probably because cooperation requires trust (Kuipers 2022).

In Table 4, the cumulative payoffs for each country after 100 iterations are presented in relative units. These units represent the aggregated value of the payoffs a country receives throughout the simulation process. These relative units are dimensionless and are used to compare the performance of different countries within the simulation, reflecting the cumulative success of their chosen strategies.

Table 4. Cumulative payoffs for each country after 100 iterations.

Country	Category	Final Strategy	Cumulative Payoffs
1	Small	Generous Tit-for-Tat	3,287,319
2	Large	Tit-for-Tat	27,818,081
3	Medium	Always Cooperate	5,314,262
4	Medium	Tit-for-Tat	36,690,050
5	Small	Always Cooperate	5,133,721
6	Small	Always Defect	3,765,800
7	Small	Tit-for-Tat	3,782,402
8	Medium	Always Cooperate	7,461,958
9	Small	Always Cooperate	3,950,124
10	Small	Always Cooperate	4,483,764
11	Small	Always Cooperate	5,500,975
12	Small	Always Cooperate	3,223,603
13	Medium	Tit-for-Tat	8,087,985
14	Small	Always Defect	2,903,647
15	Small	Always Cooperate	4,524,781

3.2. Monte Carlo Simulation

To ensure robustness and account for variability in the results, we employed a Monte Carlo approach, running the simulation 100 times with different random seeds. This allows us to generate a distribution of outcomes from which we can calculate the mean and standard error of the cooperation levels. By analyzing these results, we can draw more reliable conclusions about the relationship between multipolarity and cooperation.

4. Results and Discussion

4.1. Single Simulation Results

After applying the single run simulation and accounting for a world with one large country, four medium-sized countries, and ten small countries, Figure 3 emerges after 100 iterations.

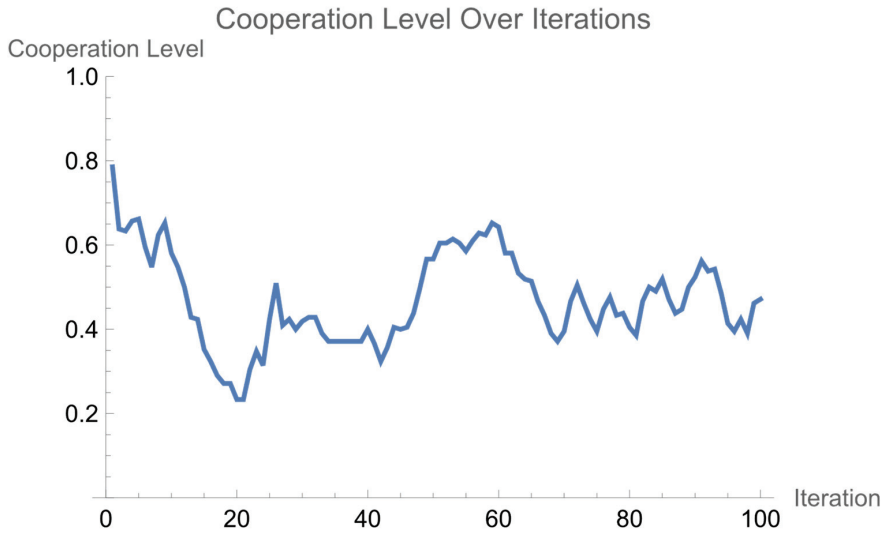


Figure 3. Cooperation levels in a world with one large, four medium- and ten small-sized countries.

The mean cooperation level was 0.468476, and the standard error was 0.0108516. Initially, we observe a drop in the levels of cooperation, followed by a volatility period and several stable fluctuations. After 100 iterations, the cooperation level followed an upward

slope. Thus, the overall level of cooperation is moderate for a scenario characterized by unipolarity.

In general, a unipolar distribution raises issues regarding the exercise of power and control over other countries (Ikenberry et al. 2009). In this setting, cooperation levels are low due to increased conflict likelihood and reliance on ad hoc coalitions (Monteiro 2012) because establishing cooperation does not necessarily moderate existing asymmetries of power (Faul 2016). This might also indicate lower percentages of risk sharing and make us rethink the operation of the balance of power, the meaning of cooperation, and the behavior of certain countries (Ikenberry et al. 2009). For example, small- and medium-sized countries adapt to a unipolar framework by maintaining autonomy (defect posture) or using cooperative schemes to bandwagon with the greatest power, form alliances, or seek shelter and hedging strategies (Tit-for-Tat or Generous Tit-for-Tat) (Schweller 1994; Vaicekauskaitė 2017).

Pure unipolarity is relatively uncommon (Kreps 2011) because it eventually gives rise to other types of distributions (Ikenberry et al. 2009). For this reason, it is essential to consider how different states of foreign affairs influence cooperation levels.

Figure 4 illustrates cooperation levels in a world with two large countries, five medium-sized countries, and eight small ones.

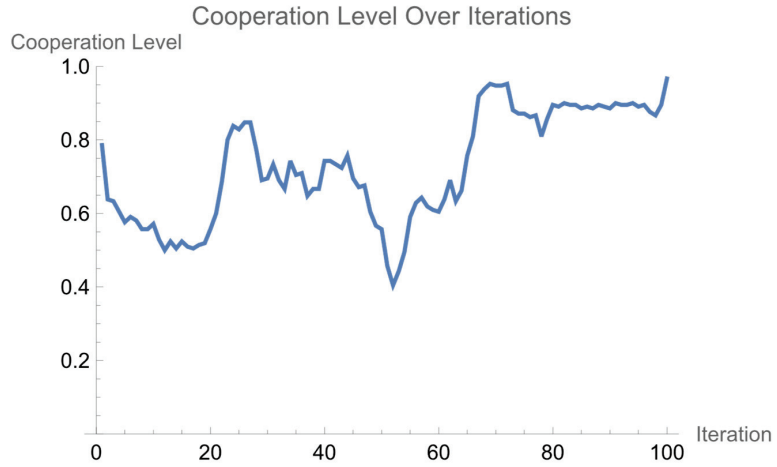


Figure 4. Cooperation levels in a world with two large countries, five medium- and eight small-sized countries.

The mean cooperation level is 0.727429 and the standard error is 0.0149597. Again, in the initial rounds, we observe a declining level of cooperation following a volatility period and a sharp decline around the middle of the game. Afterwards, cooperation levels increase and display the biggest value thus far. In this scenario, which is characterized by a bipolar setting and an increase in medium-sized countries, we observe that overall cooperation increases. This finding might be explained by the hypothesis that under bipolarity, cooperation converges towards the models provided by the leading powers (Väyrynen 1995). In this scenario, it is possible that the bipolar competition forces the two superpowers to form bounded regional orders of allies and client states (Bertelsen 2022).

The main question that arises is the following:

What happens in a multipolar setting in terms of cooperation levels?

In a multipolar system, the impact of systemic political and military factors is more complex. Such complexity affects the evolution of the international economy (Väyrynen 1995). In a scenario characterized by multipolarity, no country has a commanding international position (Väyrynen 1995). Changes in the distribution of powers can cause tipping points and determine the structure, welfare, and sustainability dynamics of the international system (Stein 2015).

Thus, multipolarity is considered a potential destabilizing factor for foreign affairs (Thompson 1986).

In our Monte Carlo simulation, we gradually increased the multipolarity levels to gain insights into the evolution of the mean cooperation levels, as presented below.

4.2. Monte Carlo Simulation Results

The results of the Monte Carlo simulations provided an indication of a positive correlation between the number of large countries and the mean cooperation level in every scenario. Specifically, with five medium countries and increasing the number of large countries from one to eight, Table 5 emerged.

Table 5. Monte Carlo simulation results for gradually increasing multipolarity.

Number of Large Countries	Mean Cooperation Level	Standard Error
1	0.6191	0.0189
2	0.6657	0.0171
3	0.6392	0.0198
4	0.6584	0.0179
5	0.7116	0.0159
6	0.6950	0.0171
7	0.7470	0.148
8	0.7582	0.0152

Contrary to the argument that multipolarity is more dangerous for global cooperation than unipolarity and bipolarity (Laïdi 2014), our simulations reveal that increasing the number of large countries is associated with higher levels of overall cooperation. Our findings align with the predictions of liberal international relations theory, which emphasizes the role of economic interdependence and international institutions in promoting cooperation (Doyle 1986). The presence of multiple large countries can enhance the stability of international institutions and create a predictable environment for cooperation (Keohane 1984).

4.3. Statistical Validation

The Pearson correlation coefficient between the number of large countries and the mean cooperation level (Figure 5) is 0.9335, indicating a very strong positive correlation. The p-value of 0.0007 confirms that this correlation is statistically significant.

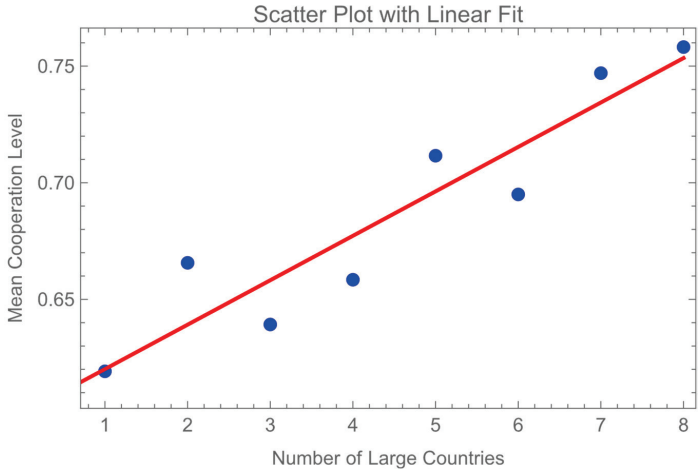


Figure 5. Scatter plot of the mean cooperation levels by the number of large countries. The fit line shows a clear positive correlation.

Furthermore, the *t*-test between the mean cooperation levels of the extreme cases—one large country and eight large countries (Figure 6)—indicated a significant difference, with a *p*-value of 0.032.

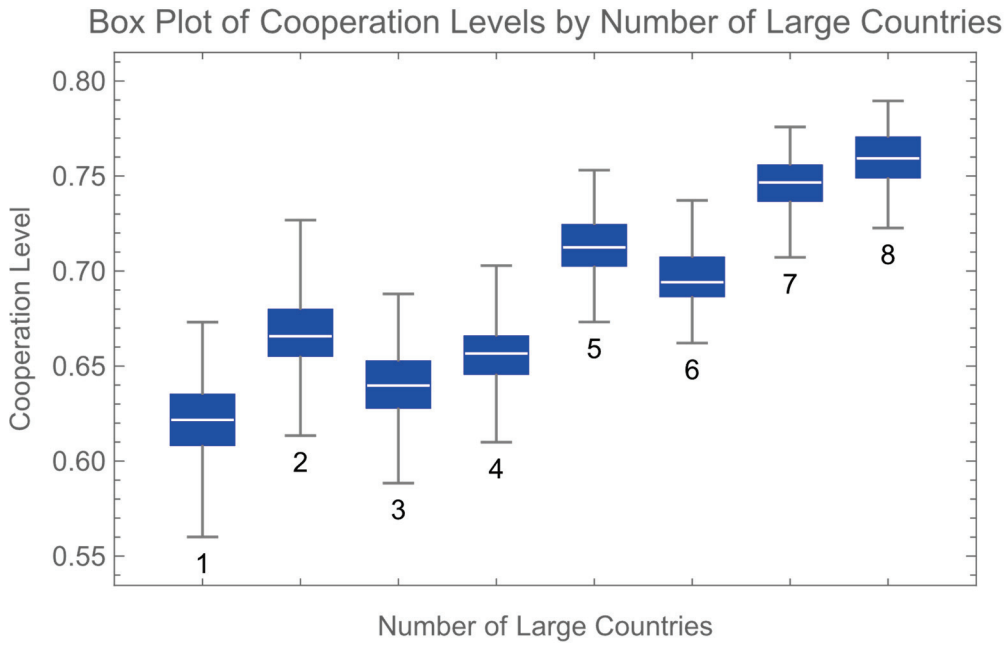


Figure 6. Box plot of cooperation levels for five medium and an increasing number of large countries.

Similar results were obtained when examining four and three medium countries while increasing the number of large countries from one to eight. The respective Pearson correlation coefficients were 0.8657 and 0.8650, both with *p*-values around 0.05, indicating statistically significant strong positive correlations.

4.4. Specific Insights from Our Findings

We found that multipolarity, characterized by the presence of several powerful states, could enhance the likelihood of international cooperation. Thus, H1 is confirmed. In essence, large, powerful countries can play a stabilizing role in the international system by promoting cooperative behavior among states. Large countries have more resources to invest in cooperative ventures, which can serve as anchors for stability and predictability (Waltz 1979). Additionally, their greater technological and economic capabilities may lead to higher gains from cooperation, incentivizing them to pursue collaborative strategies (Keohane 1984).

These findings support the idea that multipolar systems are more flexible and contain more interaction opportunities (Väyrynen 1995). Under multipolarity, countries could exhibit greater risk aversion, leading to a more pluralistic and balanced state–society relationship due to greater variations in beliefs and institutions (Väyrynen 1995). This could decrease the global risks associated with the economy, society, and geopolitical domains (Acharya et al. 2023).

On the other hand, the main concern associated with multipolarity is the isolation of states that are capable of building advanced weapons, posing a significant threat to global welfare (Posen 2009). Negative risk perceptions could also trigger a feeling of insecurity, followed by an organized shift towards self-sufficiency and autarky (Malcomson 2021). Major-power autarky is defensive, and it is not necessarily associated with a more dangerous world scenario (Malcomson 2021); however, because of the inevitable locked-in situations in the global system, this is a very concerning situation to address. An unagonized return to protectionism and autarky could lead to a situation known as a

"security dilemma" (Axelrod 1984), in which agents prioritize their own security over the security and welfare of others.

In the context of our analysis, global cooperation can falter for several reasons. One significant factor is when cooperation reaches a low point, creating a fertile ground for generalized disruption. Our simulations consistently exhibit a pattern of alternating cycles between increasing cooperation and increasing competition, akin to Kondratieff cycles observed in economic theories, regardless of the chosen parameters or number of large countries involved. Therefore, H2 is confirmed. In such scenarios, minor disagreements or conflicts can escalate rapidly, undermining trust and collaboration among nations, leading to armed conflicts and destabilization (Keohane 1984).

Additionally, the introduction of new, aggressive strategies by influential countries aiming to alter the status quo can destabilize the existing balance of power (Jervis 1978). This shift can lead to an environment in which competitive rather than cooperative behaviors dominate, increasing the likelihood of widespread international crises (Mearsheimer 2001).

Multipolarity could take two possible directions: (i) multi-growth and cooperation with sustainability, or (ii) multi-threat of the world as we know it today (Perskaya 2017). In an international geopolitical setting, multipolarity supported by conflicting agendas is the most serious source of uncertainty concerning global governance. On the other hand, a more optimistic development for international cooperation in a multipolar framework is cooperative multipolarity (de Aguiar Patriota 2017).

To achieve sustainability and welfare at a global level, institutions and legislative frameworks operating at a global level are in a position to define, apply, monitor, and enforce technical and economic conditions and rules for a set of operators (Agrell 2015). Consequently, if societies and countries aim to promote social welfare, the role of institutions and specific economic structures in fostering sufficient, sustainable, and inclusive growth through the interconnection effect is crucial (Kanzola 2023).

This discussion is already prominent because promoting stability under multipolarity is critical (Roberts 2023). In this direction, there is an emerging need for the configuration of conditions that favor cooperation. Multilateral organizations such as the International Monetary Fund (IMF), World Bank, and the North Atlantic Treaty Organization (NATO) will play a pivotal role (Tago 2017). Nonetheless, the aforementioned international cooperation platforms as well as the overall global governance architecture need reform (Sithole et al. 2024). This argument is supported by the historical evolution of these mechanisms. They were established after World War II, when the dynamics of world powers differed significantly from those today. It is questionable whether the current institutional framework can adequately respond to the challenges posed by the diverse influences on universal balance.

The international system of intervention and supervision of the global cooperation agenda, such as the IMF, World Bank, and World Trade Organization (WTO), should adapt to the new conditions. In this direction, it is important to redefine the meaning of development, economic growth, global threats, and sustainability in order to align with life values and, therefore, be acceptable to all players (Orliange 2021). In economics, there is also the rising question of whether the dollar, as a reserve currency, is slowly but steadily losing its influence. This is a double-edged sword because it raises issues regarding the global lender of the last resort and questions global stability. For the time being, the USA remains at the top of the global power hierarchy (Ryan 2023).

Another example of the destabilization of the world order is the possibility of a food crisis. During the 2008 food crisis (De Schutter 2009), it was required to use new "unconventional" policy measures, highlighting the need for the establishment of new cooperation tools capable to prevent universal hunger (Peres and De Souza Daibert 2017). Hence, the absence of effective world back-stop mechanisms (in economic and security relations) increases the difficulty of keeping the ball from leaving the field—by increasing the risk and the possibility of systematic world welfare leakages.

A factor that potentially promotes cooperation is global trade, but this does not include the globalization of production (Brooks 2024). Furthermore, enhancing trust, transparency, and respect for cultural and national values as well as establishing an accepted agenda for common global action are indispensable for effective cooperation and conflict resolution in our increasingly interconnected world.

In the history of human cooperation, forces and changes have bound us together, while others have driven us apart. As a principle, the future is simultaneously unknown and known because it is generated in the present (Kanzola 2023). Taking action in the present will favor a desirable future in terms of global developments, provided that individuals, institutions, and governments are forward looking. Nevertheless, it is important to remember that the future also depends on elements of order and randomness (McKinsey Global Institute 2023; Watts 2003). In other words, it is impossible to predict negative or positive serendipity; we can only prepare for what we know. Therefore, efficient cooperation is possible and promotes stability but is not inherently guaranteed; it requires time, trust, effort, and proper dynamics. In return, it offers stability, risk mitigation, and security.

4.5. Limitations, Contribution, and Future Research Guidelines

Despite its insights, the present study has certain limitations. One noteworthy constraint is the simplified set of strategies, which includes only the Always Defect, Always Cooperate, Tit-for-Tat, and Generous Tit-for-Tat strategies. Although these strategies provide a foundational understanding of cooperation dynamics, they do not encompass the full spectrum of real-world behavior. More advanced strategies, such as the Pavlovian and probabilistic approaches, can yield richer insights into strategic interactions (Pereira and Martinez 2010). Additionally, the fixed strategy assignment in any given round does not allow for the evolution of different strategies against each player. This feature is crucial for capturing the realistic evolutionary dynamics of players' competitive coalitions (Płatkowski 2016). A relatively small number of countries may also be insufficient to observe long-term evolutionary trends in a more realistic setting. Some strategies may only show true efficacy or failure in an environment of strategic alliances and rivalries between shifting coalitions.

Future research should incorporate more diverse and sophisticated strategies to expand the scope of simulations. Including strategies that adapt based on historical interactions or environmental cues would provide deeper insights into the mechanisms driving cooperation and defection (Smith 1982). Furthermore, a larger number of countries in the model allows for a more realistic simulation of global interactions, thereby capturing the complexity and diversity of international relations. This expansion will enable the model to include a wider variety of strategies and behaviors, reflecting the heterogeneity of real-world geopolitical dynamics.

Finally, the model can be improved with a network-based approach in which players depict nations in alliances or competitive relationships with other countries. Each player's strategy can then be influenced not only by individual interactions but also by the behavior of their allies and adversaries. Alliances could encourage coordinated strategies and promote mutual cooperation within the coalition, whereas rivalries could lead to more aggressive competitive strategies between opposing groups. This networked structure allows us to simulate how geopolitical dynamics, such as the formation and dissolution of alliances and the impact of rivalries, affect overall cooperation and defection patterns (Jackson and Wolinsky 1996).

In terms of contributions, this paper contributes to the field by expanding an evolutionary iterated game to explore future scenarios and provide insights into long-term dynamics. Utilizing a Monte Carlo framework enhances the robustness of the simulation, allowing a more comprehensive analysis of strategic interactions under varying conditions. This approach helps to understand how different strategies perform over time and under different scenarios, thus offering a valuable tool for predicting and studying the evolution of cooperation and defection in complex systems.

Consequently, the present study generated a framework for developing strategic insight into complex, multi-actor situations that is well suited for addressing real-world problems (Bekius and Gomes 2023). This framework is also useful for strengthening the various roles of foresight, understanding the relationship dynamics in the real economy, and speculating about a desirable future (van der Duin et al. 2014). Thus, the present approach allows for the use of models to understand the different aspects of international relationships in terms of a unified theory (Snidal 1985). This approach has both empirical and theoretical significance because it generates insights and understandings beyond the perceived relationships. These expansions also stimulate the integration of game theory simulations in political economies, international politics, and scenario design. Consequently, the analysis emphasizes the necessity of an interdisciplinary supportive social structure for cooperation under multipolarity, considering the impact of global sociopolitical and economic trends.

5. Concluding Remarks

In this study, we explored whether multipolarity contributes to cooperation using an iterated game theory approach. Our findings suggest that the presence of multipolarity tends to increase the likelihood of cooperation, at least from a theoretical perspective. This finding is important given the current discussion that the new multipolar order of the world economy could undermine global stability. Nevertheless, in order to ward off this dangerous possibility, proper institutional structures and the alignment of social goal setting are required (Waltz 2000). Under these conditions, a multipolar system could lead to the development of the global economy by avoiding the use of military conflicts. In any case, it should be mentioned that the promotion of cooperation is a difficult attempt given that policymakers and governments often discard theoretical models and insights for reasons related to the importance of historical path dependence, national interests, and tradition.

To ensure global sustainability, it is important to introduce a consistent framework for the market economy that balances risks and rewards and promotes systematic resilience (Roberts 2023). Otherwise, trying to minimize risks reduces rewards and creates vulnerabilities (Roberts 2023). At the same time, trying to always maximize rewards could lead to overlooking potential threats and risks (Roberts 2023). Therefore, the future of global cooperation and welfare in a multipolar setting depends on finding mutually beneficial activities and a strict legislative framework that prohibits one party from overruling the other and mitigates several conflicts of interest (Axelrod 1984).

Therefore, one pivotal contribution of the present study is to describe the conditions under which global cooperation can break down. Understanding these conditions is crucial, as it facilitates the identification of tipping points capable of generating disruption in international relationships and potentially triggering a global crisis. Cultivating this ability to foresee the dangers and opportunities of a changing order of things before their actualization (Machiavelli [1566] 2008)[3] is vital for maintaining international stability and peace (Oye 1986).

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Conflicts of Interest: The authors declare no conflicts of interest.

Appendix A

The following Table A1 of Appendix A consists of the real economies used in order to assign attributes to the countries in our model.

Table A1. The real economies used in order to assign attributes to the countries in our model.

Category	Countries	GDP (Current USD bn.)	Exports of Goods and Services (% of GDP)	Tariff Rate, Applied, Weighted Mean, All Products (%)
Large	China, USA,	17,820–23,315	10.9–19.9	1.5–2.3
Medium	Brazil, Canada, France, Germany, India, Italy, Japan, Korean Rep., Russian Federation, United Kingdom	1650–5035	18.1–47.3	0.7–7.8
Small	Albania, Algeria, Angola, Argentina, Armenia, Austria, Azerbaijan, Bahrain, Bangladesh, Belarus, Benin, Bolivia, Bosnia and Herzegovina, Botswana, Brunei Darussalam, Bulgaria, Burkina Faso, Cambodia, Chile, China, Colombia, Costa Rica, Cote d'Ivoire, Croatia, Cyprus, Czechia, Denmark, Dominican Republic, Ecuador, El Salvador, Estonia, Ethiopia, Finland, Georgia, Ghana, Greece, Guatemala, Guinea, Honduras, Hungary, Iceland, Israel, Kazakhstan, Kenya, Latvia, Lithuania, Macao SAR, Madagascar, Malaysia, Mali, Moldova, Mongolia, Morocco, Nepal, New Zealand, Nicaragua, Niger, North Macedonia, Norway, Oman, Pakistan, Paraguay, Peru, Philippines, Portugal, Qatar, Romania, Senegal, Serbia, Slovak Republic, Slovenia, South Africa, Sri Lanka, Sudan, Tanzania, Uganda, Ukraine, Uruguay, Uzbekistan, Viet Nam, Zambia, Zimbabwe	14–503	2.2–99.3	0.00–12.7

Source: World Bank Open Data for the year 2021.

Notes

1 For example, the "Thucydides Trap" refers to the conflicts that can arise when a rising power (China) threatens to surpass a ruling power (the United States of America—USA).

2 Traditional game theory focuses on interactions between perfectly rational individuals. Conversely, evolutionary game theory concentrates on (i) large populations that interact randomly, and (ii) the assumption that players employ adaptive rules instead of engaging in perfectly rational behavior (Wallace and Young 2015). It is concerned with finding the dominant strategy as well as with the fact that frequency-dependent fitness introduces a strategic aspect to evolution.

3 Niccolo Machiavelli in *The Prince* (Machiavelli [1566] 2008, pp. 43–44) not only states this, but also explains the reason behind the significance of being able to foresee future troubles: Leaders should *"[. . .] regard not only present troubles but also future ones, for which they must prepare with every energy, because, when foreseen, it is easy to remedy them; but if you wait until they approach, the medicine is no longer in time because the malady has become incurable; for it happens in this, as the physicians say it happens in hectic fever, that in the beginning of the malady it is easy to cure but difficult to detect, but in the course of time, not having been either detected or treated in the beginning, it becomes easy to detect but difficult to cure. This happens in affairs of state, for when the evils that arise have been foreseen (which it is only given to a wise man to see), they can be quickly redressed, but when, through not having been foreseen, they have been permitted to grow in a way that every one can see them, there is no longer a remedy"*.

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Impairing Globalization: The Russo-Ukrainian War, Western Economic Sanctions and Asset Seizures

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Abstract: The potency of economic sanctions imposed on nations depends on demand and supply adjustment possibilities. Adverse GDP impacts will be maximal when import, export, production, distribution and finance are inflexible (universal non-substitution). This paper elaborates on these conditions and quantifies the maximum GDP loss that Western sanctions could have inflicted on Russia in 2022–2023. It reports the World Bank's predictions, contrasts them with the results and draws inferences about the efficiency of Russia's workably competitive markets. This paper shows that Russia's economic system exhibits moderate universal substitutability and is less vulnerable to punitive discipline than Western policymakers suppose. The likelihood that economic sanctions will compel the Kremlin to restore Ukraine's territorial integrity ceteris paribus is correspondingly low, even though war reduces Russia's quality of existence. Western economic sanctions serve narrow geostrategic ends that are reconcilable with Pareto-efficient free trade and globalization, if precision-targeted, but as the Russo-Ukrainian war intensifies, an expanded array of novel and dubiously legal sanctions is degrading free trade, and spurring de-globalization and anti-Western coalitions. If this armed combat is prolonged, the goals of free trade and globalization could be set back for decades.

Keywords: Russo-Ukrainian War; economic sanctions; western security; trade diversion; de-globalization; frozen assets; Russian economic performance; Russian economic prospects; rational choice; quality of existence

JEL Classification: F51; F52; P51; P52

1. Introduction

Globalization as conceived in the West is a process of transforming non-Western societies into progressive, democratic free enterprise systems founded on Pareto-efficient free trade and international labour mobility.[1] The terms of trade in a harmonious global community are determined competitively, and there are no politically motivated barriers to entry. All members of the community maximize their utility. Within this limit, free trade is Pareto-ideal, assuming political tolerance (Popper 1945). If this condition is violated, globalization is necessarily Pareto-inferior with illiberal consequences. Geopolitically imposed barriers to trade will reduce living standards, and intolerance will impair the quality of existence.

The West's globalization agenda has been set back by rivalries within the West, between NATO and Russia and among the West, China and the Global South, compounded by stern economic sanctions, secondary sanctions on third parties, oil price caps, asset freezing, frozen asset collateralization, impoundment, the Russo-Ukrainian War and related armed conflicts.

This essay investigates the main aspects of sanction-driven de-globalization, identifying the purposes, promises, outcomes and alternatives without taking sides. It finds that Western leaders persistently overestimate sanction benefits and underestimate direct and indirect material costs as well as losses in the quality of living and de-globalization.

This study recommends that politicians everywhere rediscover the virtue of Pareto rational choice calculus and discard winning-at-all-cost thinking.

2. Economic Sanctions

Economic sanctions including trade embargoes and bans on SWIFT bank-clearing transactions are punitive geopolitical measures employed by governments against states, businesses and individuals to chasten misbehavior (Morgan et al. 2023; Cipriani et al. 2023; Jentleson 2022; Rosefielde and Bernstam 2024).[2]

They are geopolitical instruments that signal disapproval and are useful in this sense even if they fail to chasten offenders. Economic sanctions are not protectionist tools like tariffs and quotas or tax-generating devices. They are a form of interstate bargaining fostering political ends.

Economic sanctions may have unintended adverse effects on the West and non-aligned parties, but politicians seldom attempt to minimize them. Symbolism and geopolitical impact are more important than efficiency.

Powerful economic sanctions sometimes may deter aggression and escalation, compel de-annexation and defeat adversaries.

The potency of sanctions partly depends on transgressors' attitudes. Foes may be blasé, conciliatory or intransigent.

The Kremlin is sometimes accommodative. The Soviet Union under pressure from the Jackson–Vanik amendment to the Trade Act of 1974 lightened restrictions on Jewish emigration to improve East–West relations.

Economic sanctions also may serve as a device for funding proxy wars and compelling adversaries to pay reparations for damages caused by their aggression.

They can be used to establish and preserve hegemony and slow the pace of waning geopolitical power.

Policymakers recognize that economic sanctions are likely to be political face-saving devices (Jentleson 2022), unless paired with military coercion.

3. Russo-Ukrainian War

Once the Biden administration committed itself to arming Ukraine on 10 November 2021 (U.S. Department of State 2021; Rosefielde 2023; Slawter 2024), it began fashioning stern sanctions to support NATO's mission (RFE 2019; Mulder 2022, 2023, 2024; Johnson 2024).

NATO did not declare war on Russia or openly engage in an armed struggle to expel Kremlin forces from Ukraine. It chose instead to wage a proxy war against Moscow, providing Kyiv with weapons and punishing the Kremlin with stern economic sanctions. This decision precluded a naval blockade and the seizure of Russian assets because the West was not a principal in the armed conflict.

The Russo-Ukrainian war tests the proposition that stern economic sanctions (European Council 2023a), including asset destruction (Entous et al. 2023; Hersh 2023; Rosefielde and Mills 2022; Sherr 2023), significantly and efficiently enhance prospects for restoring Ukraine's 1991 borders, given existing levels of Western military assistance and moral suasion. The experiment shows that stern sanctions failed to pulverize Russia's economy but did reduce worldwide welfare, cause immense collateral damage to some Western nations and innocent bystanders, and accelerate de-globalization (politically motivated diminishment of worldwide free trade and finance).

4. Universal Substitution and Non-Substitution

The impact of Western economic sanctions depends on consumer preferences, input substitution possibilities and factor mobility (Dorfman et al. 1958; Rosefielde 1973, 1998), and absent monetary and "black swan" macroeconomic effects (Taleb 2007). If domestic goods and services including technology and finance are strong substitutes for embargoed imports and exports, variable factors of production are mobile and strong substitutes,

and monetary effects are negligible, then sanctions against competitive economies cannot greatly reduce GDP (Stolper and Samuelson 1941; Keynes 1936). Domestic substitutes will swiftly replace embargoed imports, and other types of domestic production will expand to replace lost foreign sales with modest utilitarian sacrifice. Trade diversion may further lessen the bite of Western economic sanctions.

Embargoes must cause some utilitarian loss. If they do not, then there could not have been a competitive basis for trade.

Russia's economy is imperfectly competitive and, therefore, vulnerable to stern economic sanctions. Anti-competitiveness impairs input substitution, factor mobility, product distribution, financial efficiency and trade diversion possibilities. Maximum damage will occur when anti-competitiveness and various other demand and supply-side constraints rigidly fix input use, output, assortment and distribution. If "universal non-substitution" prevails, buyers will refuse to substitute domestic manufactures and non-Western imports for embargoed goods and services (strong non-substitution) and businesses will be hindered from expanding domestic production to replace lost foreign export sales because the variable factors of production are immobile, non-substitutable (marginal rates of factor substitution are zero) and financially constrained.[3] Under these worst-case conditions, workers in embargoed export activities will be permanently unemployed and gross domestic product will be correspondingly diminished. Stern economic sanctions will plunge Russia into deep depression, pressuring Putin to restore the Ukrainian status quo ante.

The impact of stern Western economic sanctions has been mild because Russians satisficed by buying dis-preferred goods and services (forced substitution) when embargoes constrained import choice,[4] and producers, factors, and distributors efficiently responded to embargo-altered demand. Moderate universal substitutability implies that demand for domestic import replacements and domestic products including intermediate inputs will quickly increase after sanctions are imposed, facilitated gradually at first and then more briskly later by improving factor mobility across activities, intra-multiproduct firm factor substitution (Rosefielde and Pfouts 1988) and financial adaptation.[5] Russia preserved high employment because the variable factors of production were moderately mobile and substitutable, and finance was flexible.

Imperfect competitiveness assures that stern embargoes imposed against Russia will significantly reduce consumer utility and living standards (per capita GDP) in the short run.[6] However, their cumulative impact is apt to be bearable because Russian markets are sufficiently flexible; the West's embargo is porous (European Council 2023a); and the Kremlin has cultivated alternative non-Western trade partners like China, India, Turkey, and Iran. Poorer results from the Kremlin's point of view are possible, but only if the Russian economy is straitjacketed by stronger universal non-substitution or destabilized by monetary shocks.

5. Russian Trade Dependency

Exports comprised 25.2 percent of Russian GDP in 2020, and imports 20.6 percent, computed at dollar purchasing power parity prices (WITS 2023). The Kremlin's top export products were natural resources and agricultural products. Rouble shares were similar.

Ceteris paribus, if Russia's economy exhibited strong universal non-substitution, a complete international embargo would have triggered a 25.2 percent contraction in Russian GDP from 24 February to 31 December 2022. This is the maximum instantaneous impact assuming the total cessation of Kremlin exports and strong universal non-substitution.

This figure overstates the maximum contraction because many of Russia's important trade partners like China and India are not participating in the embargo, and Western sanctions are not comprehensive. A rough adjustment for the porousness of sanctions and trade diversion possibilities suggests a maximum GDP loss of 10 percent, a figure in line with the initial estimates of the World Bank (World Bank 2022) and World Forum (World Forum 2022).

Better results from Putin's perspective, meaning smaller contractions in Russian GDP, occurred because universal substitution proved to be moderate. Rosstat (Federal State Statistics Service) and the European Council expected Russia's 2022 GDP to decline by 3–4.5 percent before revising the forecast to 2.1 percent, revealing that the Russian market system is adequately competitive. Russia's economy displayed good import substitution, labour mobility, factor substitution and financial adaptation (European Council 2023b; Kumar 2023).

Although many Western observers contended that G-7 and EU trade embargoes including SWIFT transfers would devastate Russian GDP and guarantee Ukrainian victory (Thompson 2022), they were confounded when Russian consumers sub-optimized, and variable factors of production and finance proved moderately substitutable and mobile. The Russian GDP in 1989–1998 fell more than 44 percent during the early post-communist transition due to Gorbachev's and Yeltsin's dysfunctional markets (Bush 1999), but Western trade embargoes in Putin's workably competitive market have not sharply diminished Russian GDP, critically constrained war funding or even significantly curbed imports. The likelihood that Western sanctions will force Putin to withdraw from Ukraine is correspondingly low because Russia's workably competitive market institutions are responding constructively to internal and external shocks. Future gains in technological progress should mitigate the deadweight loss further, even if stern sanctions never expire.

6. Technological Progress

Western leaders contend that they will intensify and tighten sanctions until Kyiv with NATO assistance wins the Russo-Ukrainian war but face the prospect of diminishing returns (European Commission 2023). The World Bank believed in late 2022 that sanctions might reduce Russia's GDP a few additional percent in 2023 (Congressional Research Service 2022) but recently reversed itself, forecasting a 2.5 percent gain (Kumar 2023). The full 2022 lower bound GDP deadweight loss from sanctions now is 2.1 percent below the 2021 benchmark. It will persist until the West rescinds its sanctions, even though future productivity growth may conceal the deadweight burden.

The deadweight loss cannot be entirely undone so long as stern Western sanctions persist. If the Russo-Ukrainian war is settled and sanctions annulled, the gain in trade efficiency should significantly increase GDP, providing Putin with a peace dividend for restoring the status quo ante.

Many analysts, assuming moderate non-technology substitution, contend that the static deadweight loss is the tip of the iceberg, that the value of foregone GDP growth exceeds the static sacrifice. Anders Aslund and Maria Snegovaya believe revoking Western sanctions on direct foreign investment and technology transfer would increase Russia's sustainable GDP growth rate by 3 percent per annum (Åslund and Snegovaya 2021). If Russia's natural annual rate of GDP growth (Solow 1956), driven by technology diffusion, capital deepening and catchup effects, were 3 percent without technology transfer, as the World Bank predicted after the 2008 global financial crisis, then in accordance with Aslund and Snegovaya's hypothesis, normalization will increase the Russian GDP growth rate to 6 percent per annum. If Moscow relies solely on non-Western technology transfer, this figure falls to 4.5 percent.[7] The deadweight dynamic loss under this assumption for 2022 was 1.5 percent per annum.

The power of compounding should swiftly make the dynamic deadweight loss from stern sanctions greater than the static sacrifice, but rapid catchup is possible soon after the latest generation technology transfer is resumed, reflecting cumulative improvement after 2022.

Russian policymakers may grasp the expected static and dynamic costs of Western economic sanctions. Estimates of the impact of the Western sanctions in 2014–2021 like Aslund and Snegovaya's were published before the Russo-Ukrainian war (Gurvich and Prilepskiy 2016, 2019). If the Kremlin is conversant with them, the principle of revealed

preference indicates that the sacrifice is not great enough to induce Putin to restore Ukraine's territorial integrity.

Washington and Brussels acknowledge that the impact of stern economic sanctions has been less than they predicted. Policymakers are chagrined (Tan 2023) but remain optimistic and are inclined to continue treating sanctions as potent geopolitical gestures, even if Putin never relents (U.S. Department of State 2023a, 2023b).

7. Russian Adjustment

Stern sanctions, including the SWIFT ban (Johnson 2024), failed to crush Russia's economy because factors, product assortments, consumer demand and domestic financing proved to be moderate substitutes; businesses evaded the West's embargo; and the Russian Central Bank still holds large foreign reserves (bne IntelliNews 2023; Shaw et al. 2023). The Kremlin lubricated these adjustments by increasing military spending in 2022. It plans to boost defense expenditures to USD 71 billion in 2023 (Rácz et al. 2023; Luzhin 2022; SIPRI 2023; Freedman 2023). Domestic security and law enforcement spending will rise by nearly the same amount, offsetting diminished demand from foregone industrial exports. Industrial production fell a mere 0.6 percent in 2022. Strong global demand for Russian oil, gas and fertilizer is also a plus.

India sharply increased its consumption of Russian oil, importing 1.2 million barrels each month—33 times the levels seen a year earlier. Turkey imported 213,000 barrels of Russian diesel each day, the most since 2016. Exports to Russia have also proved more resilient than sanction headlines suggest. Russian imports from Turkey in December stood north of USD 1.3 billion, more than double the levels a year earlier. European Union countries spent more than USD 150 billion on Russian fossil fuels from 24 February to 31 December 2022 (Kumar 2023; Simes 2023). Russia even managed to preserve a steady import flow of Western consumer goods.

Western price caps imposed on Russian oil similarly have been ineffective (Economist 2023; Aris 2023d; International Working Group on Russian Sanctions 2022). They neither reduced Russian GDP nor significantly hampered Kremlin war funding (Lawford 2023). Allied sanctions more broadly have not triggered regime change. The West rhetorically remains resolute (Johnson and Wolfram 2023), despite growing unofficial pessimism (Graham 2024), but its punitive strategies do not seem regime-threatening (Aris 2023a, 2023b).

8. Global Adjustment

Western economic sanctions constrained workably competitive utility seeking and reduced Russian gains from global commerce. Diminished trade efficiency harmed most of the Kremlin's commercial partners, but trade diversion benefited some non-Western states by reducing import costs and increasing export demand. Rising energy costs caused by sea-borne petroleum import restrictions and the destruction of the Nord Stream gas pipeline roiled the West. Food price inflation sparked by Russian countersanctions harmed consumers across the globe. Expanded coal usage damaged the environment. Elevated energy prices are hollowing out the German industry (Aris 2023c). Although American and EU GDP growth was strong in 2022, the West underperformed Russia in 2023, while China and India continued benefitting from Russian trade diversion. China has acquired most of Russia's auto production facilities abandoned by Western corporations (Stolyarov and Marrow 2023).

9. Third Party Asset Collateralization and Impoundment

The mounting costs of the Russo-Ukrainian proxy war led Western politicians to consider using Russian financial assets frozen by stern economic sanctions to defray war costs (Boocker et al. 2024) in violation of the property rights protections undergirding free trade for non-belligerents. The West disregarded the possibility at first because it was not a combatant and third-party asset seizures undermine the integrity of global financial systems with potentially catastrophic consequences. Western politicians however were

undaunted, devising numerous schemes to impound interest accruing in Euroclear and, then, later collateralizing accrued interest and principal to issue loans of sundry sorts, supporting Ukraine's war effort.

They sought triple political credit for assailing the Kremlin with economic sanctions, providing supplementary financial assistance to Ukraine, and making Russia foot the bill (Becker and Gorodnichenko 2024; Rosefielde and Bernstam 2024; Hill 2024; Tribe and Zoellick 2024; Sonnenfeld et al. 2024; European Commission 2024).

The primary goal was to aid Ukraine with frozen Russian funds derived from Western economic sanctions on private Russian citizens, financial institutions and the Central Bank of the Russian Federation (sovereign debt), held on a custodial basis in Western financial institutions like Euroclear to Ukraine.

The basis for freezing and expropriating some or all custodial holdings and transferring them to third parties is problematic (Subacchi and Lastra 2024), both in multi-national statute and established global legal practice. Freezing Kremlin financial securities and impounding accrued interest because the West sympathizes with the Ukrainian cause is not a universally recognized justification for defaulting on Western financial obligations,[8] but this did not deter the West from insisting that its construction of the law "is" international law. Russia, China and most of the Global South reject the West's right to speak for the rest, but Washington and Brussels ignore their objections.

The West's assertion of its third party right to impound Russia's assets is a large step toward punishing Russia by making the Kremlin pay part of Ukraine's war costs, but it undermines the contractual foundation of the global financial system supporting globalization.

The misappropriation of accrued interest on financial assets sold by America and Europe to Russia constitutes a default on the West's obligation to fully repay its debts. When Washington impounds accrued interest due to Russia by the US Treasury Department, it puts China and others on notice that the West may do the same to them. The prospect of capricious default, regardless of Washington and Brussels' rationalizations, could prompt China and others to cut their lending to Western governments by trillions of dollars, triggering a global spike in interest rates.

10. Reparations

The European Union's evasive statement that it will employ multiple devices to fund Ukraine's war effort and reconstruction (Apulia G7 Leaders' Communiqué 2024; European Union 2024; Wintour 2024; Foy and Politi 2024; Sorgi and Hanke Vela 2024) was quickly condemned by those who construe economic sanctions to require Russia to fully compensate Ukraine and the West for the costs of the Russo-Ukrainian proxy war (Wall Street Journal 2024). This places a new twist on the concept of economic sanctions, interpreting them to require prepayment of war reparations to proxy warriors.

11. Secondary Sanctions

The West, frustrated by Russia diverting trade from the West to other sources, is aggressively denying circumventors access to SWIFT, effectively substituting Western geopolitical dictate for free trade and making a mockery of globalization. Individuals and businesses under NATO's proxy war rules are only permitted to utility seek when Western politicians permit them to do so, spurring de-globalization (politically motivated diminishment of worldwide free trade and finance) by pitting the West against the rest. If the West loses the Russo-Ukrainian War, it still might continue using secondary sanctions with innovative justifications pressuring primary and secondary parties to acquiesce to Washington's political dictate (Miller and Nowak 2024; Lewis and Lawder 2024).[9]

12. Escalation

Increasing Western military support for Kyiv in tandem with expanding secondary economic sanctions against nations assisting Russia in circumventing primary sanctions is

impairing globalization by creating ever greater barriers to free commerce among the West, East and Global South, including de-dollarization.

China, Russia and India, fearing Western economic sanctions, have developed substitutes. China's surrogate is The Cross-border Interbank Payment System (CIPS). It offers clearing and settlement services for its participants in cross-border renminbi (RMB) payments and trade. In 2022, CIPS processed around CNY 96.7 trillion (USD 14.03 trillion), with about 1427 financial institutions in 109 countries and regions connected to the system. Russia's substitute clearing system is called The System for Transfer of Financial Messages (Russian: Система передачи финансовых сообщений). It serves 20 states and 550 organizations.

The rapid development of CIPS and SPFS is not only contributing to the partial de-dollarization of the global financial system but also strengthening the Sino-Russian coalition, separating the East from the West, enhancing Russia's ability to prolong the Russo-Ukrainian war and fostering de-globalization.

The short-term antidote for the damage done to globalization by primary and secondary Western economic sanctions is the negotiated de-escalation of the Russo-Ukrainian War and improved rules of proxy war economic sanctions that optimize NATO's utilitarian net benefit (minimizing unintended collateral damage) instead of crushing Russia's economy.

13. Conclusions

Punitive economic sanctions imposed by the West on Russia to restore Ukraine's status quo ante failed because Russia's workably competitive market-driven wage, price, supply, and distribution adjustment mechanisms proved moderately effective. Although sanctions initially reduced Russian GDP at great global economic cost, Russia's economy subsequently rebounded impressively.

Market forces thwarted Western policymakers' intentions. Putin did not capitulate. This was not a fluke. Sterner sanctions given moderate universal substitutability would not have appreciably increased Russia's GDP losses and would have further diminished global welfare.

The revealed preference suggests that the West will continue claiming that economic sanctions will compel Russia to yield until the proxy war is settled. Washington and the EU will not bother devising smarter net benefit optimizing sanctions that preserve embargoes on military exports to Russia while mitigating losses sustained by global producers and consumers. The Biden administration presumably feels that it is wise to keep up appearances and will continue upping the ante by impounding interest on frozen Russian assets, collateralizing these assets and working to impound the principal as partial prepayment of war reparations despite the risk of destabilizing the global financial system. The West likewise will continue pressuring Putin by expanding secondary economic sanctions even though they are strengthening the Sino-Chinese and Russo-North Korean coalitions, antagonizing the Global South, degrading free trade and impairing globalization (politically motivated diminishment of worldwide free trade and finance). It is a big price to pay for the illusion of success.

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Notes

1 If the Pareto efficiency standard is discarded, then any politician can claim that the existing trade regime is best from their geopolitical perspective.

2 Sanctions prohibit adversaries from importing goods and services from the embargoing nations and selling their domestic outputs abroad. For a full assessment of economic sanctions, see (Morgan et al. 2023).
SWIFT is a messaging service that facilitates information exchange between banks and other financial institutions. It connects more than 11,000 entities worldwide.

[3] Zero marginal rates of factor substitution occur when isoquants are rectangular. Leontief input–output tables are constructed with rectangular isoquants. Domestic manufacturers in multiproduct firms producing import substitutes and embargoed export goods can increase output by reallocating variable factors from embargoed exports to import substitutes, despite the strong restriction non-substitution places on single-product firms.The West embargoes Russian imports and exports. The export embargo does not directly affect domestic consumption in the strong non-substitution case. The West's import embargo prevents Russian consumption of foreign goods. This is a deadweight loss, given strong non-substitution because, under strong non-substitution, domestic substitutes cannot replace embargoed imports.

[4] The export embargo affects domestic employment and derivative demand for imports.

[5] Intra-multiproduct firm, inter-enterprise, inter-sectoral and inter-distributional factor mobility and substitution normally will differ across activities. Embargo-imposed forced demand substitution and moderate factor substitution and mobility will shift production downward from the production possibility frontier and alter the product mix. The precise effects of these adjustments are computable in principle, given perfect information. See (Rosefielde et al. 1985).

[6] The effect on consumer or other sovereign utility is assessable with a Bergson social welfare function. See (Bergson 1938, 1954, 1976; Kahneman 2011; Rosefielde 2023). Bergson's social welfare function transforms outputs into consumer utilities, expressed cardinally in national currencies. Exact utilitarian calculation is impossible (Rosefielde and Pfouts 2014). The sovereign decides the appropriate policy action on whatever decision criteria they prefer.

[7] This adjustment assumes that Russia receives technology transfer from non-Western suppliers and leakage from the West. The figure is conjecture.

[8] The West does not acknowledge that failure to pay interest on securities owned by Russia is a "default", claiming Western governments have the right to expropriate interest payments on frozen securities held by custodians like Euroclear. The West, in its view, is not defaulting. It is impounding interest. The US Treasury stills pay interests on Russian-owned debt. It is Congress that confiscates it. https://en.wikipedia.org/wiki/International_sanctions_during_the_Russian_invasion_of_Ukraine (accessed on 31 August 2024)

[9] "Imposing sanctions and trade restrictions on China would be as disruptive as sanctions have been on Russia's auto industry, with dramatic implications for the world economy".

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The Risk of Protectionism: What Can Be Lost?

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Abstract: The increasing wave of protectionism in various corners of the world with the use of seemingly attractive but economically misleading slogans (shortening supply chains, onshoring, reshoring, nearshoring, friend-shoring, reindustrialization, and ending/correcting 'hyperglobalization', etc.) creates a serious challenge to the global trading system and global economic development. Trade and financial transactions have also become victims of the increasing number of geopolitical conflicts and tensions, both 'hot' and 'cold'. Before it becomes too late, i.e., before the current trade tensions go too far and create the hardly reversible spiral of trade and financial wars, retaliations, etc., it is desirable to reflect on what can be lost due to protectionism. This essay analyzes four areas that have benefited from global economic integration since the 1980s (economic growth, poverty eradication, reduction in global economic inequalities, and disinflation) and may suffer from its reversal. It also discusses potential remedies that may help stop a protectionist drift.

Keywords: protectionism; globalization; trade; financial transactions; economic growth; poverty; income inequality; disinflation; World Trade Organization

1. Introduction

The rapid global economic integration period, globalization[1], started in the 1980s and gained momentum in the 1990s and early and mid-2000s. It stagnated after the global financial crisis (GFC) and never regained its previous dynamics. Worse, since the end of the 2010s, the risk of its reversal has intensified. The United States (US)–China trade conflict and geopolitical rivalry, the COVID-19 pandemic, Russia's aggression against Ukraine, and protectionist sentiments worldwide have stayed behind this trend change. The notions of deglobalization, decoupling, economic fragmentation, and even Cold War II (Robinson and Ferguson 2023; Gopinath 2023) have been frequently floated in political and economic debate.

Before it becomes too late, i.e., before the current trade tensions go too far and create the hardly reversible spiral of trade and financial wars, retaliations, etc., it is desirable to reflect on what can be lost due to the fragmentation of the world economy. This essay serves this purpose. Its primary aim is to focus on potential global economic and social losses, especially in emerging market and developing economies (EMDEs), due to protectionism and deglobalization. While individual negative aspects of global economic fragmentation are frequently discussed in the literature, they are usually discussed from the perspective of individual countries or bilateral relations and serve the purpose of the current policy debate[2]. The intended value added of this paper is to summarize arguments in defense of continuous worldwide economic integration from the perspective of global growth dynamics, poverty reduction, mitigating global income inequality, and price stability.

This essay is based on a literature review and empirical research.

It starts with a historical overview of two waves of globalization—between 1870 and 1914 and a century later. It is followed by an analysis of the factors that determined the rapid globalization between the 1980s and 2000s (Section 2) and the socio-economic gains

attributed to globalization (Section 3). Section 4 is devoted to the increasing protectionist pressures at the end of the 2010s and early 2020s and the expected negative consequences of deglobalization/fragmentation of the world economy. In Section 5, we discuss policy remedies that can arrest protectionist trends. Section 6 contains a summary and conclusions.

2. A Brief History of Globalization: The First and Second Wave

The globalization episode of the late 20th/early 21st century was not the first in contemporary economic history[3]. A century earlier, between 1870 and 1914, there was another period of globalization (see, e.g., Bordo et al. 1999; O'Rourke and Williamson 2000; Morys et al. 2008; Daudin et al. 2010) underpinned by the first and second industrial revolutions, relatively liberal trade policies, the gold standard and full convertibility of major currencies, and, last but not least, relative peace between major political and economic powers.

A brief look at the history of the first globalization wave helps in understanding the origins and dynamics of the second wave, and the factors that may cause its demise.

Industrial revolutions facilitated mass production, in which the economy of scale and market access (beyond national borders) played an increasing role. New technical innovations[4] (steam power and railways, followed by electricity and combustion engines) made transporting goods and people cheaper and safer. They also contributed to the development of new means of communication (the telegraph then the telephone), which made trade and financial transactions more accessible and less expensive.

The gold standard and currency convertibility reduced transaction costs and exchange rate risk. The gold standard also eliminated the risk of inflation. On the contrary, there were periods of price decline (Meltzer and Robinson 1989) due to a limited supply of gold, productivity gains, and business cycle fluctuations.

Finally, the absence of open conflicts between major powers[5] reduced security risks and the risk of a sudden regime change in trade and financial flows. Hence, it was unsurprising that WWI brutally interrupted the first wave of globalization.

The interwar period of the 1920s and 1930s was characterized by increasing trade protectionism and capital movement restrictions. The collapse of four empires in Europe and its periphery (Austro-Hungary, Germany, Russia, and the Ottoman Empire) caused the appearance of several new states with new currencies and customs borders. Several European countries had problems rebuilding their fiscal and monetary equilibria in the immediate post-WWI period and returning to the convertibility of their currencies. Austria, Germany, Hungary, Poland, and Soviet Russia experienced hyperinflations (Solimano 2020, pp. 25–60). The Union of the Soviet Socialist Republics (USSR), created in December 1922 by the Bolshevik regime on the territory of the former Russian empire, introduced a centralized system of command economy at the end of the 1920s based on a monopoly of state ownership and a far-reaching autarky (Leonard 2023). The US chose the isolationist direction of its foreign and economic policy (Dadush 2023).

The Great Depression, which started in the US in September 1929 and hit the entire world economy for the first half of the 1930s, triggered a new wave of beggar-thy-neighbor policies such as competitive devaluations or rising trade barriers[6]. WWII further devastated the global economy and global trade. As a result, the share of global exports of goods in the world's GDP declined from 14.0% in 1913 to 4.2% in 1945 (Fouquin and Hugot 2016, Figure 1).

The post-WWII global economic and financial architecture with the triad of international institutions (the International Monetary Fund, World Bank, and International Trade Organization) was to rebuild global economic integration and overcome interwar protectionism. However, reintegration proceeded slowly and with many zigzags. The failure of the US Congress to ratify the Havana Charter of the International Trade Organization did not allow this organization to take off[7]. For almost half a century, the world trade system was regulated by a looser General Agreement of Tariffs and Trade (GATT) and its secretariat in Geneva. Only the Marrakesh Agreement in April 1994, which finalized the eighth round of multilateral trade negotiations (MTNs), called the Uruguay Round,

allowed the creation of the World Trade Organization (WTO) with a broad trade policy agenda. In the meantime, trade liberalization progressed incrementally by covering new policy areas and bringing more countries via subsequent rounds of MTNs (see Table 1).

Table 1. GATT trade rounds, 1947–1994.

Year	Place/Name	Subjects Covered	Countries
1947	Geneva	Tariffs	23
1949	Annecy	Tariffs	13
1951	Torquay	Tariffs	38
1956	Geneva	Tariffs	26
1960–1961	Geneva Dillon Round	Tariffs	26
1964–1967	Geneva Kennedy Round	Tariffs and anti-dumping measures	62
1973–1979	Geneva Tokyo Round	Tariffs, non-tariff measures, "framework" agreements	102
1986–1994	Geneva Uruguay Round	Tariffs, non-tariff measures, rules, services, intellectual property, dispute settlement, textiles, agriculture, creation of WTO, etc.	123

Source: https://www.wto.org/english/thewto_e/whatis_e/tif_e/fact4_e.htm (accessed on 18 August 2020).

Initially, the GATT system involved predominantly advanced economies (AEs). Due to the decolonization process, emerging market and developing economies (EMDEs) joined the GATT in more significant numbers from the 1960s. Most former communist economies in Europe and Asia joined the GATT/WTO in the 1990s, 2000s, and early 2010s when they advanced their transitions to a market system.

In other policy areas, the progress in opening economies, both advanced (AEs) and emerging market and developing ones (EMDEs), was also slow. Most of them had inconvertible or only partly convertible currencies. Although the Bretton Woods system of fixed but adjustable pegs decreased transaction costs, it proved ultimately unstable and collapsed in 1971 (Garten 2021). As a result, the 1970s and 1980s were marked by trade tensions (for example, between the US and Japan) originating from exchange rate disputes. It was also a period of macroeconomic instability in many corners of the world.

On top of that, economic policies and systems, with a more significant role of state ownership and government regulation, chosen by several AEs, did not help economic openness. The situation was even worse in EMDEs. Many adopted the statist and autarkic development models, with high protectionist barriers and import-substitution industrialization as a reaction to former colonial links. Some EMDEs tried to copy the economic model of communist countries, usually with disastrous socio-economic consequences.

Since the early 1980s, as a reaction to earlier policy failures, several AEs and EMDEs have entered the path of market-oriented reforms, including more significant trade and financial openness. It allowed the acceleration of MTNs, especially the Uruguay Round, and progress in global economic integration. Far-reaching economic reforms in large EMDEs such as China and India, the former Soviet Union (Dabrowski 2023), and Central and Eastern Europe boosted global trade, investment, and financial flows.

As a result of the above policy changes, global trade in goods and services to the world's GDP ratio grew rapidly between 1980 and 2008 (Figure 1). This expansion was driven, among others, by the subsequent rounds of MTNs (in particular, the Uruguay round), the creation of the WTO and China's accession to this organization in 2001, and liberalization of current account transactions and other market-oriented reforms in several EMDEs. Innovations in transport, communication, logistics, energy, miniaturization of various devices, etc., also decreased trade costs (Figure 2).

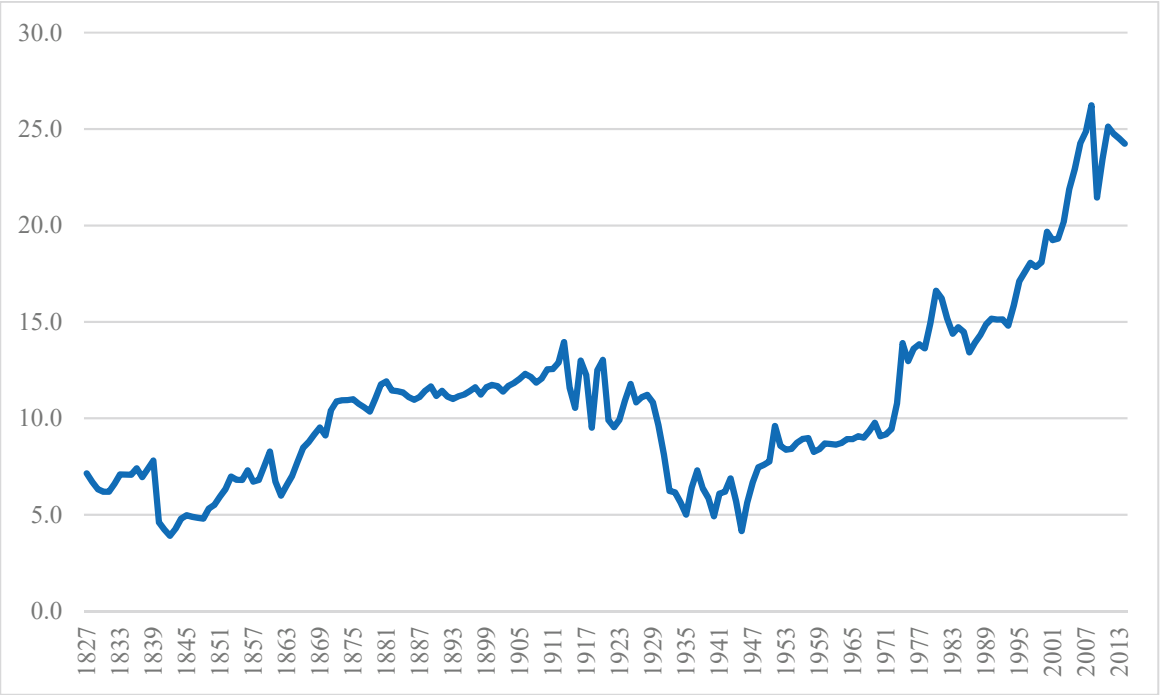


Figure 1. The world economy: merchandise exports as % of GDP. Source: https://ourworldindata.org/trade-and-globalization (accessed on 18 August 2024) after Fouquin and Hugot (2016).

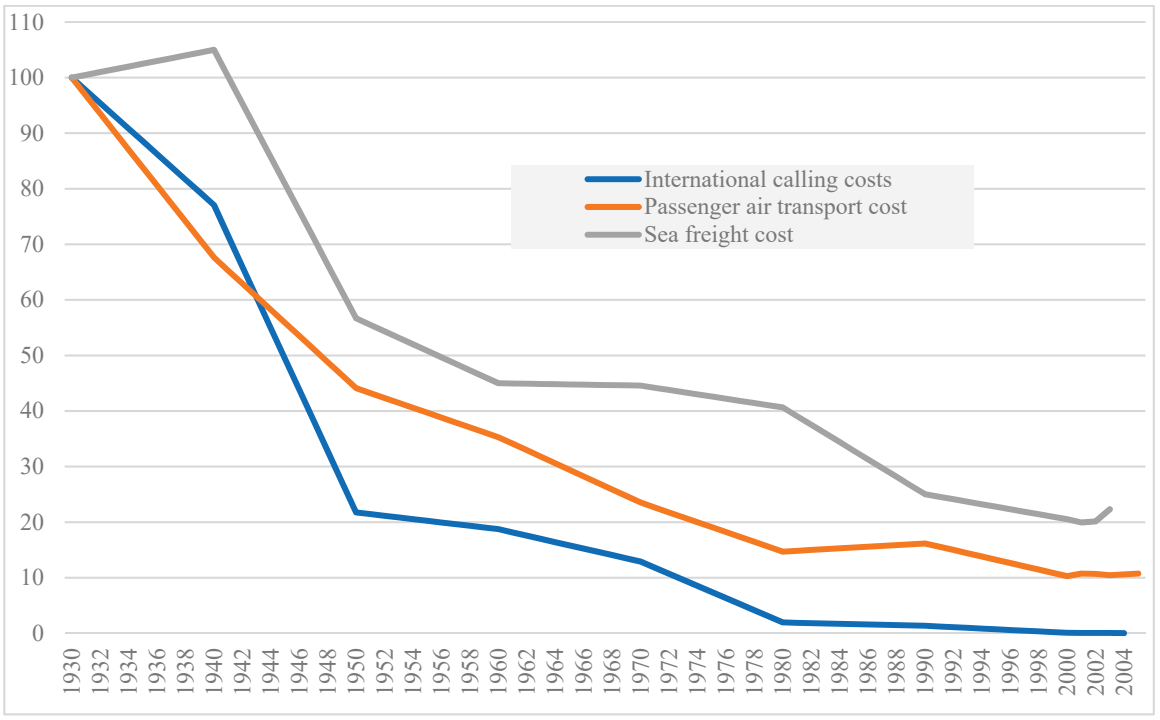


Figure 2. Real transportation and communication costs, 1930 = 100, 1930–2005. Notes: Sea freight costs correspond to average international freight charges per ton. Passenger air transport costs correspond to average airline revenue per passenger mile until 2000 and spliced to US import air passenger fares afterwards. International calling costs correspond to the cost of a three-minute call from New York to London. Source: https://ourworldindata.org/trade-and-globalization (accessed on 18 August 2024) after Huwart and Verdier (2013).

A similar trend concerned foreign direct investment (FDI) and other financial flows (Figure 3). It was driven by the liberalization of capital accounts (Figure 4), financial sector reforms, the privatization and deregulation of banks, non-banking financial institutions, and non-financial corporations with the participation of foreign capital, legal reforms, concluding in bilateral and multilateral investment-protection treaties, progress in information and communication technologies (ICTs) and their application in financial transactions, and financial innovations (facilitated, in turn, by a combination of legal innovations and new ICT tools). All these factors have eliminated institutional, legal, and technical barriers to unrestricted capital movement, especially private financial flows, across the globe, substantially reduced transaction costs, and helped to integrate national financial markets into a single global market.

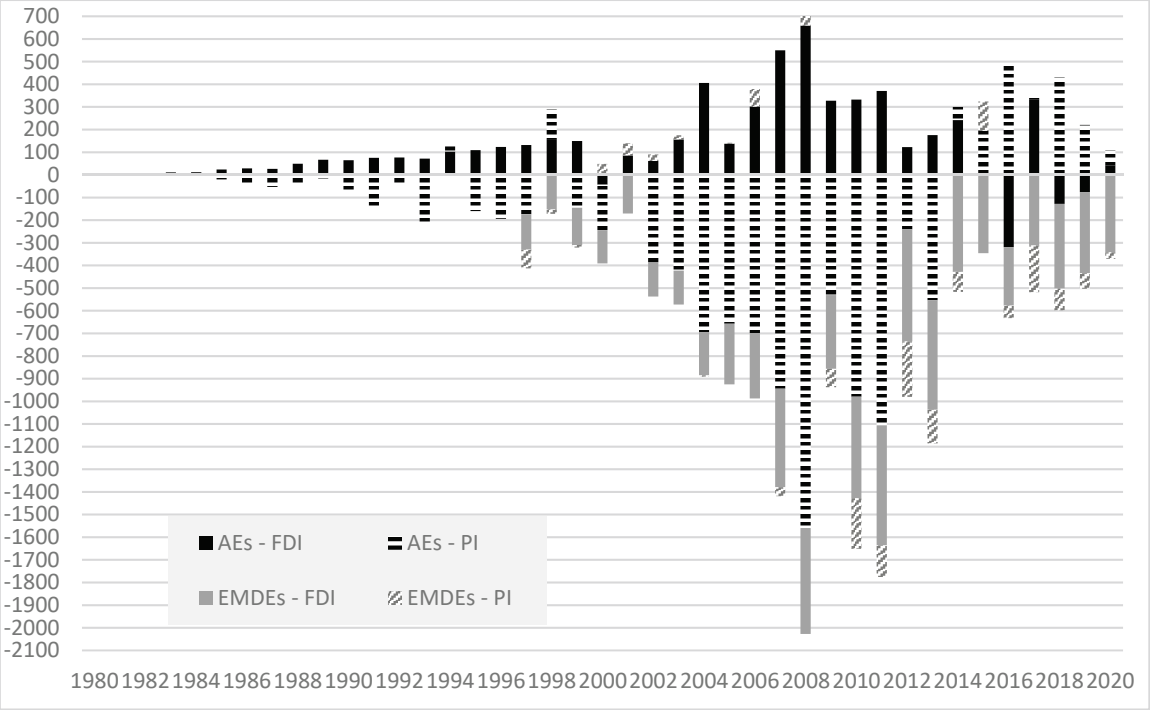


Figure 3. Cross-border net direct and portfolio investment flows in USD billion, world total, 1980–2020, BoP statistics. Note: Positive value means net capital outflow, and negative value means net capital inflow. FDI—foreign direct investment, PI—portfolio investment. Source: World Economic Outlook database, April 2021.

The liberalization of capital accounts started in the 1980s in AEs and a decade later in EMDEs (Figure 4). Substantial capital flows began with a decade-long time lag—in the 1990s in AEs and the 2000s in EMDEs[8] (Figure 3). The culmination of nominal global flows came in the 2000s. Smaller but still substantial capital flows characterized the 2010s. This resulted from disruption in financial intermediation, recession (especially in AEs), and higher uncertainty caused by the GFC. In addition, the new post-crisis macro- and micro-prudential regulations increased the costs of financial intermediation and investment financing (Dabrowski 2021).

Figure 3 also shows changes in the direction of capital flows. EMDEs were net direct investment recipients during the analyzed period, while AEs were net exporters of this investment in most recorded years. Net portfolio flows seemed to play a less significant role in EMDEs, while they were more critical in AEs. Interestingly, these flows changed direction: since 2014, AEs have become a net exporter of portfolio investment, perhaps as a result of record-low interest rates in most AEs.

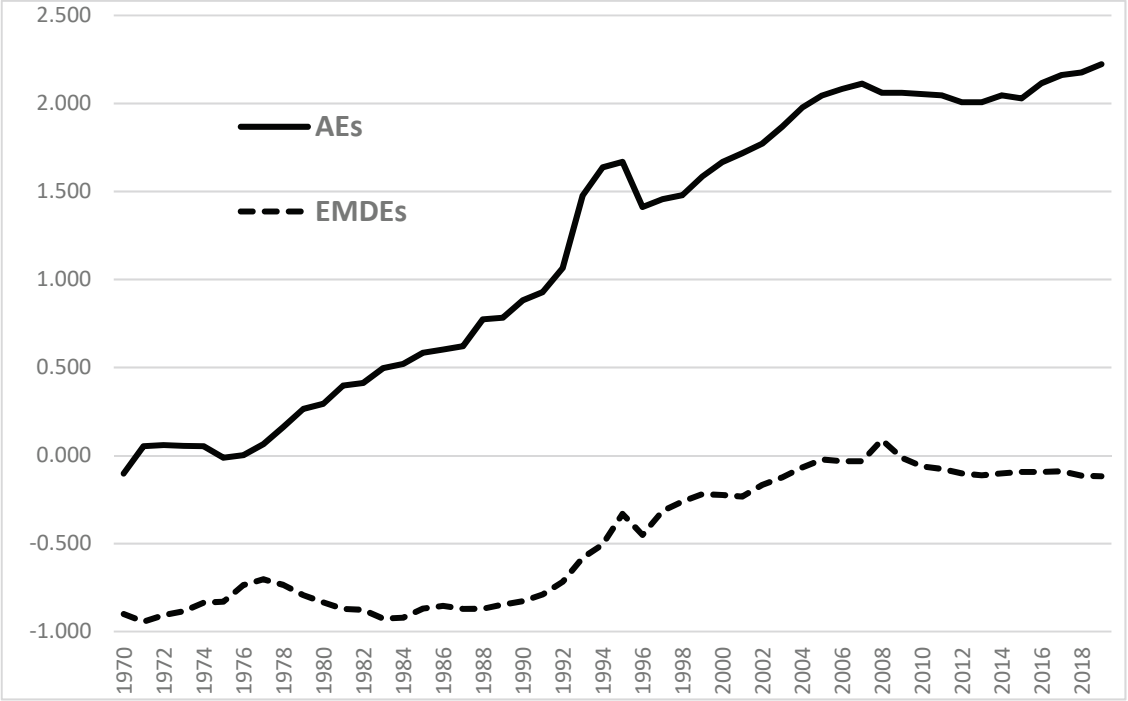


Figure 4. The Chinn–Ito Capital Account Openness Index (KAOPEN), 1970–2018. Notes: The Chinn–Ito Capital Account Openness Index is based on the information from the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). The current and capital account control degree is normalized within the scale of −1.92 (minimum openness) and 2.33 (maximum openness). Data in Figure 4 represent simple averages of indexes of respective groups of countries. The entire sample amounts to 182 countries. Source: Chinn and Ito (2006); Ito and Chinn (2020); http://web.pdx.edu/~ito/Chinn-Ito_website.htm (accessed on 18 August 2024); and author's calculation.

There have been significant differences between the two waves of globalization. The depth of the first wave was smaller than the second one. The share of exports of goods to GDP in 1913 (the peak year of the first wave) was approximately half of that in 2008 (the peak year of the second wave). In the case of financial flows, the discrepancy was even more significant (Obstfeld and Taylor 2004, p. 55). The following factors can explain the difference:

(i) Less developed technical infrastructure and higher transportation and communication costs during the first wave (Figure 2). It was essential for financial transactions, where the telegraph was the only means of rapid information transmission for conducting financial transactions and financial market arbitrage at the end of the 19th and early 20th centuries. As a result, the specter of financial market products traded internationally was smaller compared to the contemporary era.

(ii) Less liberal trade regimes during the first wave: import tariffs were, on average, higher before WWI than in the 2000s and 2010s (Estevadeordal 1997). In particular, this was the case in the US, Russia, Argentina, Canada, Portugal, Spain, Norway, and Finland. Tariffs were lower in the United Kingdom, France, and Switzerland and close to zero in the Netherlands. There were also intra-imperial preferential trade regimes (in the British and French empires). On the other hand, non-tariff barriers, such as sanitary, phytosanitary, and technical standards, played a more limited role.

(iii) Geographical coverage: pre-WWI globalization was limited to Western Europe and the US. Most of today's EMDEs remained in colonial dependence, and they benefited from economic integration only marginally and often in a distorted form.

3. Gains from Globalization 1980–2020

To illustrate the economic and social benefits of global economic integration for the world economy since the 1980s, we have chosen four areas: global economic growth, poverty eradication, global income inequalities, and disinflation. Progress in these areas has a crucial importance for socio-economic development, especially in EMDEs.

3.1. Global Economic Growth

In the 1990s and 2000s (until the global financial crisis in 2008–2009), i.e., the period of rapid liberalization of trade and financial flows, global economic growth accelerated (Figure 5), mainly in EMDEs, particularly in the so-called Emerging and Developing Asia, using the IMF's regional terminology (Figure 6). The regions of sub-Saharan Africa, the Middle East and North Africa, and Latin America and the Caribbean benefited less due to many unresolved conflicts and domestic institutional and policy barriers. Globalization was instrumental in both global growth acceleration and rapid income per capita convergence in several EMDEs (Bhagwati 2004; Wolf 2005; Maskin 2015; Patel et al. 2024).

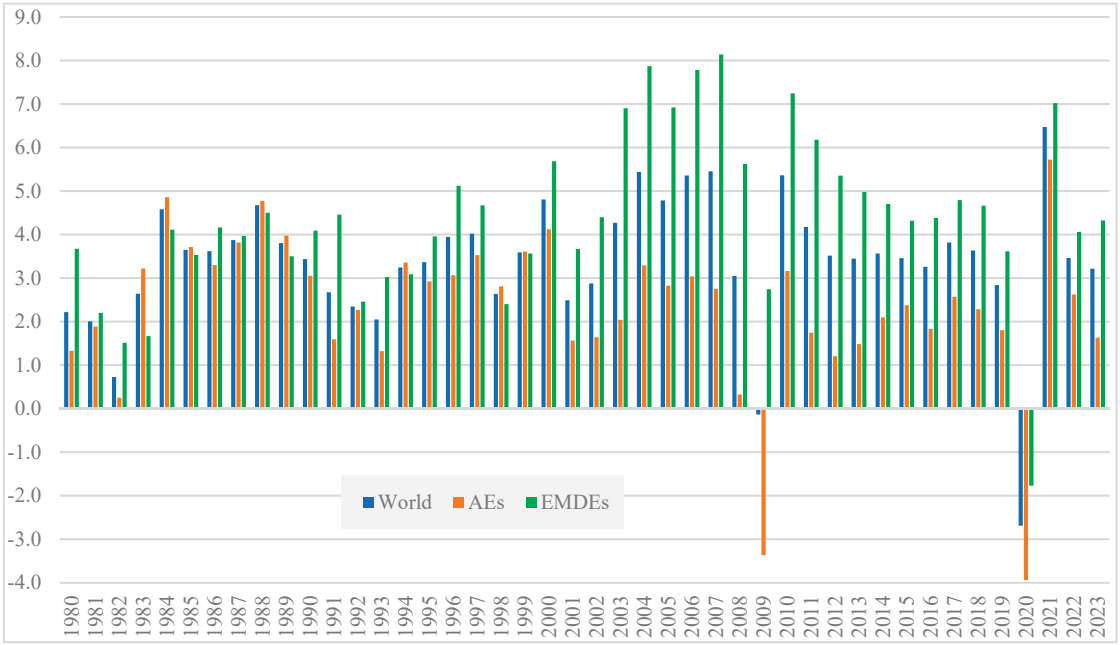


Figure 5. GDP, constant prices, % change, 1980–2023. Source: IMF World Economic Outlook database, April 2024.

AEs grew, on average, at a slower pace. However, they also benefited from globalization. In particular, it allowed for mitigating the forthcoming demographic barrier, that is, shrinking of the working-age population and population aging (Goodhart and Pradhan 2020). Global economic integration also helped AEs build global value chains (GVCs), benefit from economies of scale, and develop global financial centers on their territories.

After the GFC, the pace of global growth gradually decelerated, partly due to the direct consequences of the crisis but also due to stagnation in global trade liberalization and emerging protectionist barriers, especially at the end of the 2010s and the early 2020s (see Section 4). Nevertheless, EMDEs continued to grow faster than AEs, diminishing the income per capita gap between AEs and EMDEs built up over most of the 19th and 20th centuries.

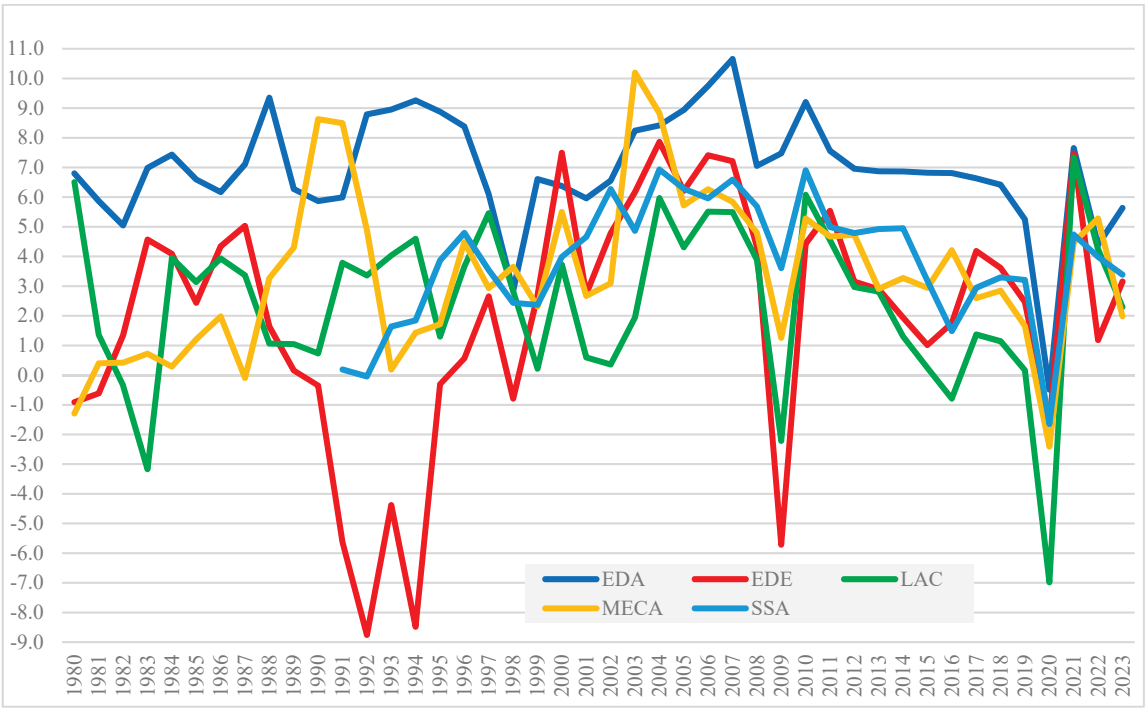


Figure 6. GDP, constant prices, annual change in %, EMDE regions, 1995–2023. Notes: EDA—Emerging and Developing Asia, EDE—Emerging and Developing Europe, LAC—Latin America and Caribbean, MECA—Middle East and Central Asia, SSA—sub-Saharan Africa. Source: IMF World Economic Outlook database, April 2024.

3.2. Eradicating Poverty

Rapid growth in EMDEs helped eradicate extreme poverty, as measured by the poverty headcount ratio of USD 2.15 daily at the 2017 PPP (Table 2). Like growth trends, the most spectacular poverty reduction has been recorded in East Asia and the Pacific and South Asian regions (according to the World Bank's regionalization).

Table 2. Poverty headcount ratio at USD 2.15 a day (2017 PPP) (% of the population), 1981–2019.

Region	1981	1986	1991	1996	2001	2006	2011	2016	2019
East Asia and Pacific	83.5	68.3	63.9	45.5	37.2	21.0	10.4	2.3	1.2
Europe and Central Asia	..	..	3.7	8.3	8.3	5.5	3.8	2.8	2.3
Latin America and the Caribbean	15.1	12.4	16.1	16.2	13.2	8.5	6.0	4.4	4.3
Middle East and North Africa	..	7.3	6.9	4.8	3.5	2.6	2.2	6.0	..
South Asia	58.0	52.3	49.0	41.9	..	33.5	21.4	15.8	8.6
Sub-Saharan Africa	..	..	55.7	57.6	55.5	47.4	41.0	37.2	34.9

Source: World Bank's World Development Indicators.

3.3. Diminishing Global Income Inequalities

Rapid economic growth in EMDEs, particularly in China, India, and other large Asian economies, also contributed to the substantial reduction in global income inequalities, i.e., inequalities among world citizens (Figures 7 and 8). This reduction was driven by decreasing income per capita differences between countries (Darvas 2018), partly reversing the opposite trend dominating most of the 19th and 20th centuries (Milanovic 2020). On the other hand, structural changes in some AEs, especially in the US, in the absence of active domestic income redistribution policies, have contributed to increasing domestic income inequalities and, therefore, to the anti-globalization backlash (Pastor and Veronesi

2018). Interestingly, the diminishing trend in global income inequalities has continued in the period of weaker global growth (in the 2010s and early 2020s) despite various adverse shocks such as the GFC or COVID-19 pandemics (Darvas 2024).

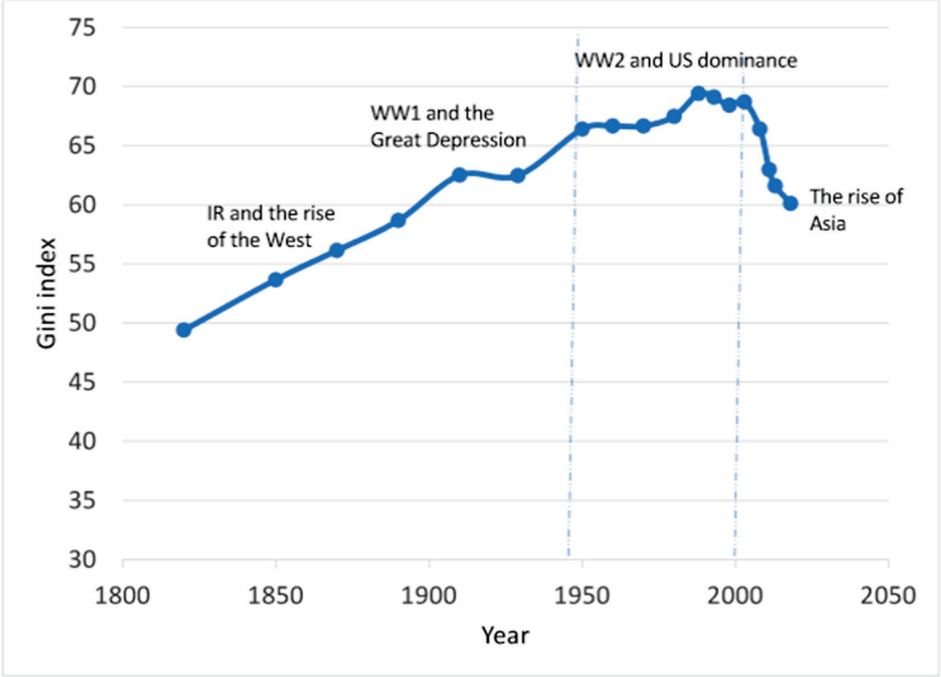


Figure 7. Estimated global income inequality, 1820–2018. Source: Milanovic (2020).

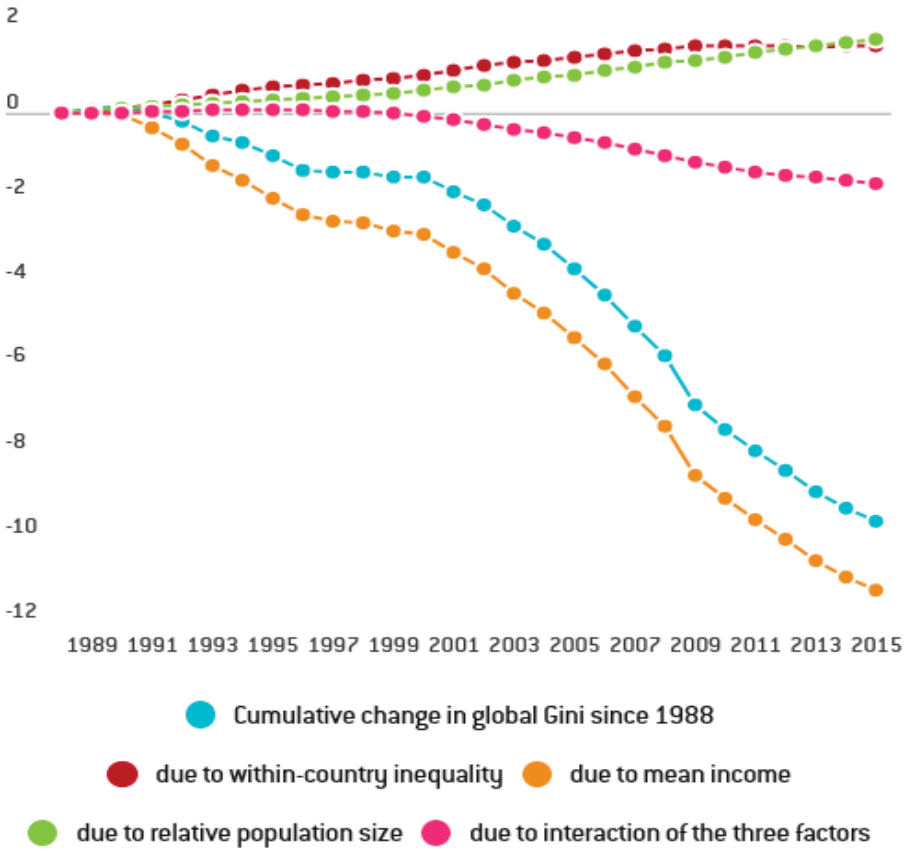


Figure 8. Change in the global Gini coefficient of income inequality, 1988–2015. Source: Darvas (2018).

3.4. Disinflation

While inflation in individual currency areas is determined, in the first instance, by their monetary and fiscal policies, global trade, financial, and to a lesser degree, migration flows can contribute to the so-called supply shocks, either anti- or pro-inflationary. A rapid liberalization in trade flows in the 1990s and early 2000s helped AEs' disinflation, pushing the prices of imported goods down (Rogoff 2003) and discouraging increases in domestic wage levels (Goodhart and Pradhan 2020). On the contrary, the recent protectionist trend has overlapped with the effects of monetary and fiscal policies in AEs that were too expansive in the 2010s and early 2020s (Dabrowski 2021), magnifying a global inflation shock.

3.5. Globalization-Related Challenges and Socio-Political Costs

Global gains such as rapid growth, especially in EMDEs, poverty eradication, diminishing global income inequalities, and support to disinflation were associated with structural adjustment, for example, moving some manufacturing and service capacities from AEs to EMDEs. It involved economic and social adaptation costs on national, regional, and sectoral levels, especially when national and regional policies did not provide sufficient cushioning and support to potential losers. In the absence of well-tailored redistribution policies, structural changes might also cause increasing national income inequalities (see Section 3.3). All these side effects have been actively exploited by populist politicians of various colors and have partly contributed to the protectionist backlash discussed in Section 4.

4. Protectionist Backlash and Associated Risks to Global Socio-Economic Development

4.1. Change in Integration Trend

From 2008, global trade and financial integration slowed and was even partly reversed (Figures 1 and 3). This trend change is often attributed to the effect of the GFC (see James 2018). While it may be true in the case of financial flows (implosion of financial markets caused by the GFC, followed by tighter micro- and macro-financial regulations, and a partial return to some forms of capital controls in EMDEs—see Figure 4), one can look at other explanations in the case of trade flows. The implementation of trade liberalization measures envisaged by the GATT Uruguay round and the Marrakesh agreement was completed around the mid-2000s. The new WTO negotiation, the so-called Doha Development Round, failed (Bhagwati 2012), so no new global trade liberalization impulses exist. The proliferation of regional and bilateral preferential trade agreements (PTAs), especially in Europe and the Asia-Pacific region, somewhat mitigated the stagnation trend but could not fully compensate for the lack of progress in global trade negotiations[9].

The end of the 2010s and early 2020s brought an increasing wave of protectionism in various corners of the world, underpinned by national political developments in individual countries, the COVID-19 pandemic, and the proliferation of geopolitical rivalries and conflicts, both 'hot' (for example, the war in Ukraine) and 'cold' (the increasing geopolitical rivalry between the US and China—see Section 4.2). Figure 9 shows the increasing number of harmful trade interventions worldwide. While these are rough numbers (individual interventions have various scales and impacts on trade flows), they confirm a rapidly growing protectionist trend.

Government financial support to exporters (Figure 10) and import-substituting producers has played a leading role in this protectionist race (Fritz and Evenett 2021; Evenett 2023). It has had various forms depending on the specific sector/industry, for example, government grants, tax exemptions, borrowing on preferential terms, loan guarantees, use of subsidized energy, capital injections, and equity stakes, including bailouts, etc. (IMF et al. 2022; Evenett 2023). Although subsidies are the subject of two WTO agreements, the Agreement on Subsidies and Countervailing Measures and the Agreement on Agriculture, several regulatory loopholes allow circumventing them in practice.

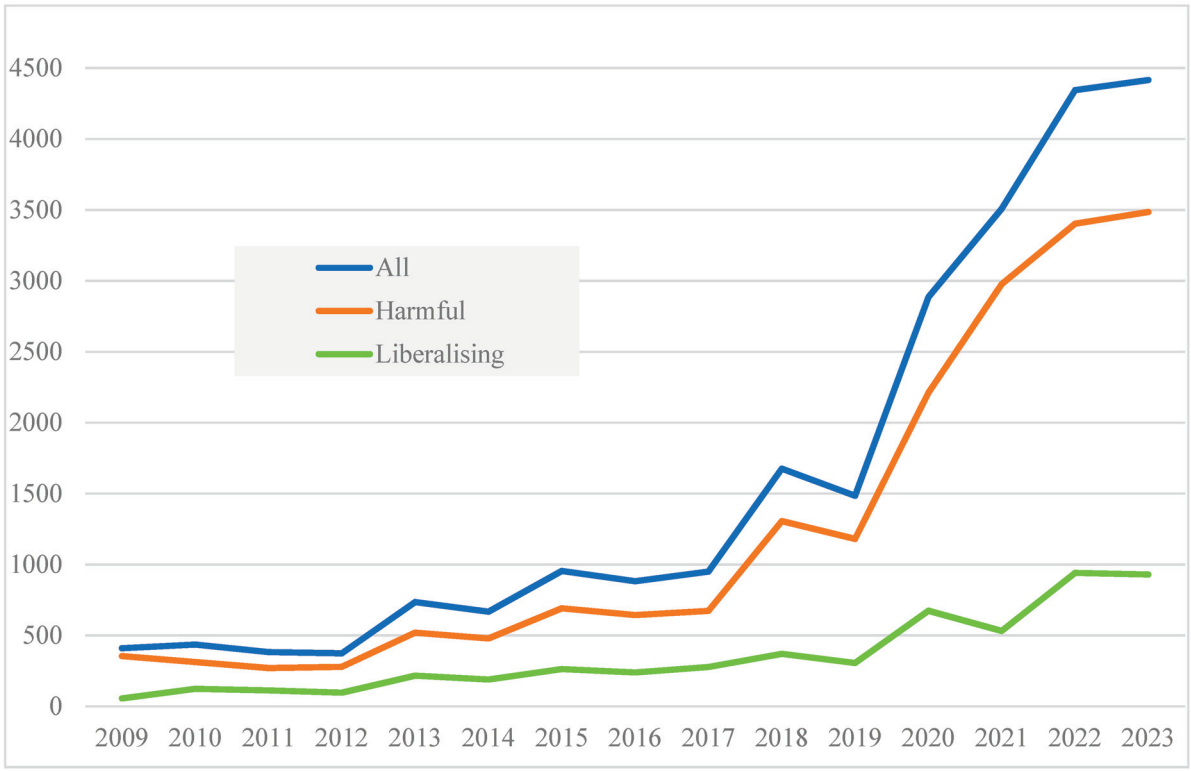


Figure 9. Number of trade interventions imposed annually worldwide (2009–2023). Source: Global Trade Alert, https://www.globaltradealert.org/global_dynamics (accessed on 18 August 2024).

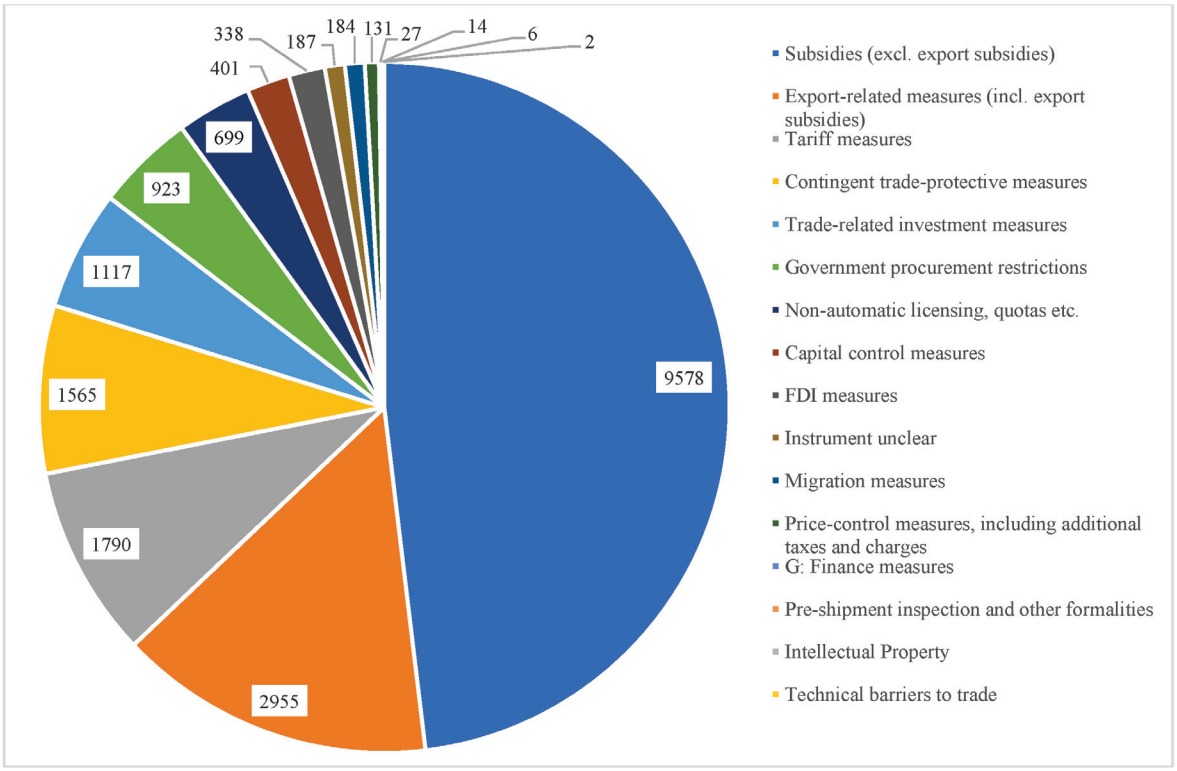


Figure 10. Number of harmful trade interventions by policy instruments used, cumulatively, 2009–2024. Source: Global Trade Alert, https://www.globaltradealert.org/global_dynamics (accessed on 18 August 2024).

4.2. The Rise of China and the US–China Trade Conflict

Since the early 1980s, China has recorded rapid economic growth due to domestic economic reforms (including economic openness), an export-led growth strategy, and the benefits of globalization. As a result, China has restored its dominant economic power status, which it enjoyed until the early 19th century. China's share of the world GDP, calculated in terms of purchasing power parity (PPP), increased from 2.6% in 1980 to 18.4% in 2021 (IMF 2023, Table A, p. 99). China has become a leading manufacturer, producer, and exporter, competing successfully with other EMDEs and AEs (Jean et al. 2023). However, the market-oriented transition in China has not been complete, and the role of the government and the Chinese Communist Party in economic management has remained significant (European Commission 2017). Chinese producers and exporters have enjoyed government support that is incompatible with the WTO rules and exceeds, by several times, the state aid in AEs (Bickenbach et al. 2024). While AEs have benefited from cheaper Chinese imports (see, e.g., Section 3.4 and Goodhart and Pradhan 2020), their expansion has also contributed to the protectionist backlash, in the first instance, in the US.

US–China trade and economic tensions, which grew gradually during the 2000s and 2010s, broke out in the form of open conflict in 2018. As a result, the average US trade-weighted import tariffs for Chinese exports increased from 3.1% in January 2018 to 21.0% in September 2019 (Figure 11). In February 2020, due to the Phase One Agreement between the US and China, they decreased to 19.3% and have stayed at this level since then (Bown 2023b). Chinese trade-weighted import tariffs for US exports increased from 8.0% in January 2018 to 21.8% in September 2019. From February 2020, they amounted to 21.3%. At the same time, they gradually decreased tariffs for imports from the rest of the world from 8% in January 2018 to 6.5% in January 2023.

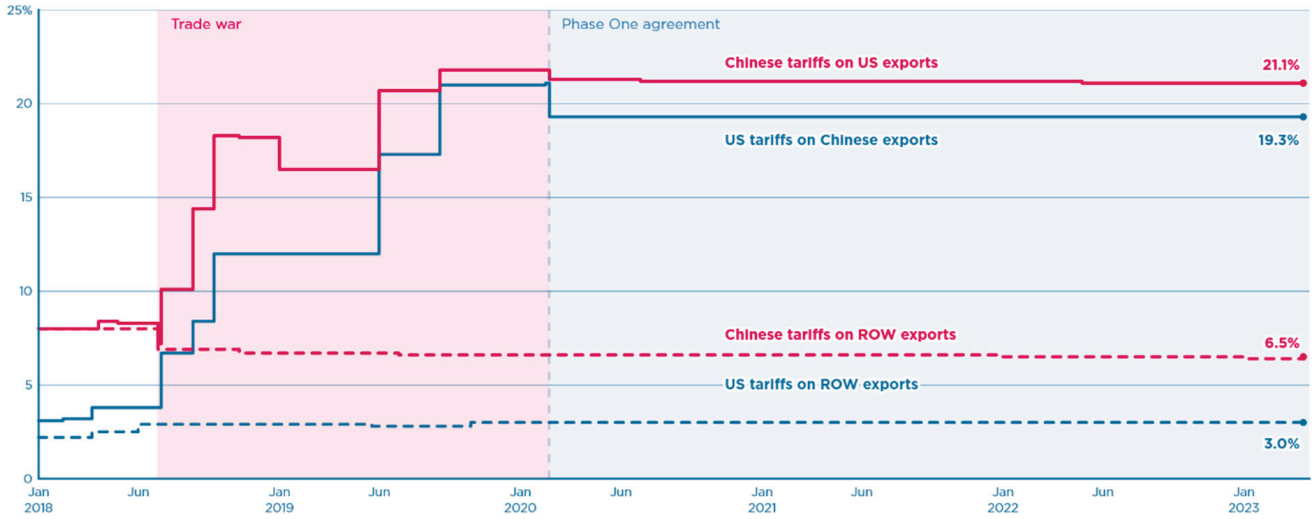


Figure 11. US–China tariff rates toward each other and the rest of the world (ROW). Source: Bown (2023b).

The protectionist drift in US trade policy under the Trump administration did not affect only China (Bown and Kolb 2023). Average US trade-weighted import tariffs for exports from the rest of the world increased from 2.2% in January 2018 to 3.0% in October 2019 (Figure 11).

In January 2023, the higher tariffs covered 66.4% of US imports from China and 58.3% of China's imports from the US (Bown 2023b).

The next step in this trade war was taken by the Biden administration on 14 May 2024. The US government introduced additional tariffs (on top of those introduced by the Trump administration) on imports from China in several sectors. For example, tariffs

on semiconductors increased from 25 to 50%, solar cells from 25 to 50%, electric vehicle batteries from 7.5 to 25%, and electric vehicles from 25% to 100% (Dadush 2024).

At the beginning of the US–China trade war, the European Union (EU) kept itself far from this conflict. On 20 December 2020, it concluded, in principle, a Comprehensive Agreement on Investment with China, which envisaged several liberalization measures on both sides (Dadush and Sapir 2021). However, this agreement has not been finalized since then. On the other hand, as of 14 June 2024, 41 out of 53 ongoing EU trade defense investigations related to imports from China.[10] Following one of these investigations, on 12 June 2024, the European Commission imposed provisional countervailing duties of between 17.4 and 38.1% on imports of battery electric vehicles from China.[11]

While the decisions against imports from China adopted by the US and EU in May–June 2024 differed legally (the EU's decision was more compatible with the WTO's procedures), they may have a similar detrimental effect on global trade. Furthermore, China will respond, most likely, with reciprocity measures against US and EU exports.

4.3. A New Protectionist Rhetoric

'Traditional' protectionist arguments referred, among others, to the necessity of protecting infant industries, jobs, and welfare systems and supporting import-substitution programs, as well as consumer, health, and environmental protection. The new protectionism employs seemingly attractive but economically misleading slogans such as shortening supply chains, onshoring, reshoring, nearshoring, friend-shoring, reindustrialization[12], ending/correcting 'hyperglobalization (a term coined by Rodrik (2011))', national security considerations, implementation of a 'green' agenda, etc.

The COVID-19 pandemic and policy responses to this calamity have provoked some of these arguments[13]. Lockdown measures initially aimed to stop the spread of the pandemic. They sought to limit the infection contagion when this goal was not met. They concentrated on national borders, where administrative controls could be easier to execute than those inside the country (although several countries have introduced formal bans on the internal movement of people). There was little international cooperation in adopting lockdown policies, even inside such a deeply integrated bloc as the EU, and many beggar-thy-neighbor measures. As a result, the pandemic caused far-reaching disruption in global supply chains (Léry Moffat and Poitiers 2024), that is, in trade, transportation, and logistical links, leading to physical shortages in many goods and services, for example, semiconductors (Kaur 2021) and containers (Teodoro and Garratt 2023).

The incorrect macroeconomic diagnosis of the crisis' character (destruction of aggregate demand, such as during the GFC) led to incorrect macroeconomic policy responses—launching massive monetary and fiscal stimuli (Dabrowski 2021). They caused global inflationary pressures in 2021–2023 and deepened disequilibria in individual product and service markets. Structural changes in demand have also caused disequilibria. For example, progress in digitalizing many services (accelerated by lockdowns) increased the demand for semiconductors and various software products.

Trade and transportation disruptions and physical shortages caused by the COVID-19 pandemic and lockdown measures stayed behind the numerous calls for shortening supply chains, reshoring, and nearshoring. They abstracted from the fact that pandemic-related disruptions also affected local markets and supply chains. They also disregarded the causes of supply shortages. Fortunately, some of these calls abated after lockdown measures were terminated, and the market mechanism helped to restore/adapt the broken GVCs quickly. On the other hand, tighter monetary policies helped to rebuild the equilibrium between demand and supply.

However, there have been other arguments (ecological and geopolitical) in favor of reshoring and nearshoring, which have not disappeared. Shortening supply chains, which can reduce CO2 emissions and prevent climate change, has been one of them. It can be the correct argument if nearshoring or reshoring will not increase cumulative CO2 emissions due to a less efficient production and service chain. A universal carbon tax (see Section 5)

would be the best instrument to stimulate the optimal localization decisions of economic agents rather than protectionist trade policy measures.

Geopolitical considerations are more challenging to internalize into the autonomous market choices of economic agents. They are subject to government decisions, and many of them affect trade and investment policies. However, governments must understand the socio-economic costs of such decisions. Geopolitical arguments cannot be overplayed, and trade and financial policy instruments cannot be overused for foreign and security policy purposes (see Section 4.4).

4.4. Geopolitical Tensions and Economic Openness

In the 1990s, after the collapse of the USSR, the dissolution of the Warsaw Pact, and the end of the Cold War, several countries could enjoy the peace dividend in the form of lower military spending, fewer security concerns in trading military or dual-use products and technologies, academic and technical cooperation, more freedom in the movement of people, and a better geopolitical atmosphere in global and regional economic cooperation[14]. However, it was a relatively short episode in world history.

The terrorist attack against the US on 11 September 2001 ended the atmosphere of relatively peaceful global cooperation. Military interventions in Afghanistan and Iraq caused the necessity of higher military spending, at least in the US. Various non-military security measures in the US and other countries affected the movement of people (especially for citizens of countries considered potential terrorist hubs) and financial transfers (tighter control of trans-border transfers to prevent financing terrorism). Fortunately, trade flows and FDI remained unaffected.

The end of the 2010s and early 2020s have brought a further deterioration in international relations. Among various examples of increasing geopolitical tensions and open conflicts, two of them deserve additional comment.

The first concerns the increasing geopolitical tensions between the US and China beyond the trade and economic conflict discussed in Section 4.2. They have been caused by the rapidly increasing military potential of China, its more aggressive foreign and security policies, its increasing assertiveness against its Asian neighbors, many of which are the US' allies and enjoy the US' security guarantees, an autocratic drift in China's domestic policies, and the US' fear of losing its status as the single global superpower. The US' protectionist measures against imports from China analyzed in Section 4.2 were partly motivated by geopolitical and security considerations. National security considerations also stood behind the export control measures introduced by the US Department of Commerce in October 2022, aimed at curbing exports of advanced chips and other cutting-edge technologies to China (Nellis et al. 2022).

The US has pushed their allies in Europe and the Asia-Pacific to create a common front against China, a partly successful pressure. China has also given increasing attention to national security considerations in its economic policy decisions (Choyleva 2024; Leonard 2024).

Fortunately, tensions between the US (and their allies) and China have not reached the stage of open confrontation, although they have an increasingly negative impact on economic relations. However, given the economic and trade potential of China and the US (and other AEs actually or potentially involved in this conflict), negative consequences for the global economy can be far-reaching (see Section 4.5).

The second severe disruption to the post-Cold War global political and economic order has been caused by the increasingly aggressive actions of Russia in its neighborhood, culminating with its full-scale military aggression against Ukraine in February 2022. The initial response of the US, EU, UK, and their allies concentrated on scaling up economic and financial sanctions initiated after the annexation of Crimea by Russia in 2014 (Dabrowski and Avdasheva 2023). Western military aid to Ukraine came later. Although Russia's share in the global GDP and global trade is much lower compared to China[15], Russia's role as a large supplier of energy resources and its countermeasures against sanctions issuers

(Dabrowski and Avdasheva 2023) caused severe economic turbulences beyond the direct zone of conflict in 2022–2023 (see, e.g., Arndt et al. 2023; McWilliams et al. 2024).

The rise of global geopolitical tensions is an argument for the subordination of economic policies to security considerations. It concerns higher military and security-related expenditures, development of the defense industry, trade and investment policies, cross-border scientific and technological cooperation, financial flows, migration, etc. The vagueness of security arguments, i.e., what are the real security risks, which instruments can be used to minimize them, what are their potential benefits (in achieving security goals) vs. their economic, social, and political costs (direct and indirect), makes the debate difficult and sometimes emotional. One can suspect that security arguments are sometimes used to mask 'traditional' protectionist demands.

Conceptually, measures motivated by security considerations can be divided into preventive (aimed at avoiding/minimizing ex ante risks) and reactive (penalizing unacceptable actions). However, an ex ante cost–benefit analysis is required in both cases. An ex-post assessment of the effectiveness of sanction packages imposed in the less or more distant past against geopolitical adversaries in achieving intended goals vs. the costs for sanction issuers and third parties (see Peksen 2019 for the literature overview) can serve as a good starting point for an ex ante analysis of any new sanction measures.

For example, the experience of far-reaching sanctions against Russia in 2022–2024 seems disappointing. They failed to stop the aggression against Ukraine and reduce, in a meaningful way, Russia's economic and military potential to continue the war. They were frequently circumvented (e.g., Hilgenstock et al. 2023; Bilousova et al. 2024; Astrov et al. 2024; Chupilkin et al. 2024). They also caused collateral damage to European economies by increasing energy prices in 2022.

The UN's sanctions against Iran between 2006 and 2016 were more effective in achieving their goal, that is, pushing Iran to limit its military spending (Dizaji and Farzanegan 2021) and freeze its nuclear program. However, the Iranian economy was smaller and less self-sufficient than the Russian one, and the sanctions against Iran had a global character. In Russia's case, several EMDEs (approximately half of the global GDP) have not joined sanctions introduced by the US, EU, UK, and their allies.

This experience with sanctions against Russia should serve as a lesson to be careful when weaponizing trade and financial instruments in geopolitical rivalry with China. This much bigger economy is more deeply rooted in the global trade and investment relations network, so attempts at its sanctioning can fail to achieve geopolitical goals and cause collateral damage to the world economy (see Cerdeiro et al. 2023; Wache et al. 2024).

4.5. What Can Be Lost?

Failure to stop protectionist trends can lead to erosion of the gains from globalization and undermine growth and macroeconomic stability perspectives in both AEs and EMDEs.

Economic growth can slow down further, given that protectionism is not the only headwind a global economy faces. A declining working-age population and population aging are other challenges, particularly in Europe and East Asia. AEs may become the main losers, but several EMDEs will also suffer. The latecomers of globalization (Africa and part of the Middle East) can lose a chance of catching up with the rest of the world.

Materialization of such a scenario does not necessarily require a global trade conflict like that in the early 1930s. It is enough to continue the fragmentation of the world trade system along the lines of geopolitical blocs, that is, friend-shoring (see Figure 12). Even countries that could expect to benefit from US–China trade tensions, for example, Vietnam and other countries in Southeast Asia, would be eventual losers because the general equilibrium effect (slower growth of a global economy) might outweigh trade diversion in their favor (Cerdeiro et al. 2023; Wache et al. 2024).

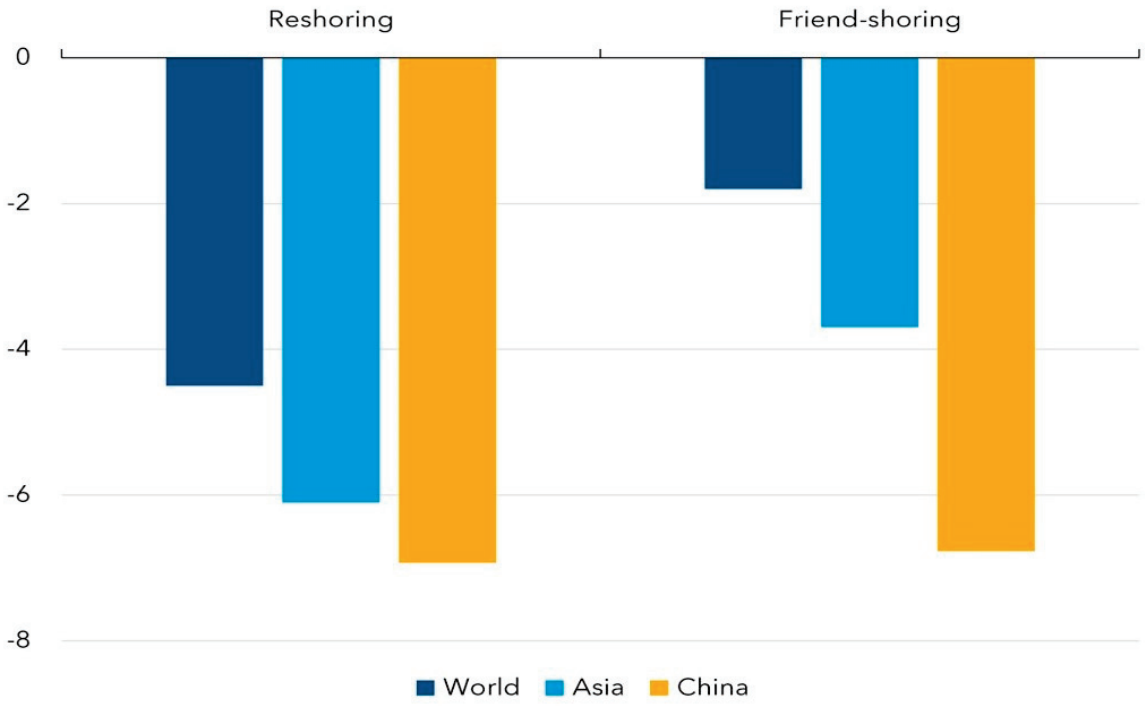


Figure 12. Losses from friend-shoring and reshoring scenarios (GDP, % deviation from the baseline scenario). Source: Cerdeiro et al. (2023).

Innovation and potential productivity growth may be other losers. They depend primarily on the free international movement of technologies, capital, investment, and people and unrestricted cooperation between universities and other research centers. Unfortunately, this movement has already been restricted, especially (but not only) between the US and China (Poitiers and Sekut 2024).

Unlike in the 19th and 20th centuries, scientific and technical progress is no longer generated predominantly in Western Europe and North America. Research and industrial centers in some EMDEs, especially in China, play an increasing role in new patents, high-quality academic publications (Poitiers and Sekut 2024), and frontier technology research. Hence, the bifurcation of research and innovation efforts will be costly and cause slower productivity growth.

Trade, investment, technology protectionism, and the slower global growth they cause will not help mitigate climate change. The mounting trade tensions around China's dominance in producing solar panels (Allison 2023), electric vehicles (Webster 2024), and high-capacity batteries (Poitiers and Sekut 2024) are good examples (see Section 4.2). They represent a clear case of the conflict between the global decarbonization agenda (which requires the mass and inexpensive production of devices and materials crucial for completing a green agenda) and industrial policy goals and geopolitical concerns in some AEs, which focus on self-sufficiency in sectors considered strategically important.

Slower growth, especially in EMDEs, caused by protectionist drift will not help further eradicate poverty and reduce global income inequalities (between citizens of the world), contributing to even stronger cross-border migration pressures. However, it can help reduce in-country inequalities.

Fighting the post-pandemic wave of inflation will take longer and involve higher output losses because protectionist measures have already generated a pro-inflationary supply-side shock[16]. Looking ahead, continued trade protectionism or even the absence of further trade liberalization measures will increase the macroeconomic and social costs of price-stability-oriented monetary policies.

Finally, the fragmentation of global trade and financial systems can undermine geopolitical stability. One can observe a vicious circle: the current conflicts contribute to protec-

tionism and economic disintegration, but the latter can trigger new conflicts. Even if trade and financial integration are not perfect safeguards against political and military conflicts (as history teaches us), they increase the costs of such conflicts and, therefore, can serve as a conflict deterrent to a certain degree (Lee and Pyun 2009). Furthermore, slower poverty eradication in EMDEs and slower progress in mitigating climate changes (due to global economic fragmentation) can also trigger new violent domestic and international conflicts.

5. Remedies

It is not too late to stop the protectionist drift and avoid the associated losses described in Section 4.5. There are at least three avenues to achieve this goal: (i) institutional reform of the WTO and continuation of multilateral negotiations aimed at updating existing global trade agreements and concluding new ones; (ii) further development of regional and inter-regional PTAs; (iii) domestic policy reforms, especially in the case of large trade players. These three avenues are at least partly interlinked.

The reform of the WTO and negotiation of a new set of global trade agreements would be the best. It could arrest the erosion of the worldwide trade rules established during the subsequent rounds of GATT and WTO negotiations. It would also save the WTO as a meaningful international institution. In an optimistic scenario, it could provide a new impetus to global trade liberalization.

Reform of the WTO has been discussed from various angles, at least since the start of the unsuccessful Doha Round (see, e.g., Soobramanien et al. 2019). Since 2017, the most urgent task has been to reform the WTO's Appellate Body, which was disabled by the US' decision to stop filling vacancies[17]. The inability of the Appellate Body to perform its statutory role paralyzes the entire system of the WTO to dispute settlements[18], the primary enforcement mechanism in the hands of these institutions.

Updated international agreements are urgently needed in the trade in services (given the increasing share of services in the GDP) and harmonization of green policies (to avoid protectionist backlash motivated by a green agenda). The growing role of subsidies and other forms of financial support to domestic producers in industrial and trade policies (see Section 4.1 and Figure 10) suggests the necessity of updating the WTO's regulations on subsidies.

Given the unanimity requirement in the WTO's decisions, which are challenging to achieve, the plurilateral agreements of countries interested in regulating trade and investment relations in a particular sector or in solving a specific problem (a coalition of willingness) seem to be the most pragmatic negotiation strategy (Schmucker and Mildner 2023). To the greatest extent possible, such agreements should consider the interests of a maximum number of WTO members, including less developed countries, not only those participating in the negotiation. They should remain open to all potential future signatories.

Parallel to the reform of the WTO and continuing global trade negotiations, efforts should be put into further developing bilateral and multilateral PTAs and deepening existing ones. PTAs are the second-best solution compared to global trade liberalization. As mentioned in Section 4.1, they involve both trade-creation and trade-diversion effects. However, if they have sufficiently broad (regional or inter-regional) coverage, the first effect may prevail over the second one. They may reinforce trade-gravity effects from geographic proximity if they involve close neighbors. In addition, they also often serve other goals beyond trade and investment relations, such as setting the stage for deeper regional economic and political integration, support to economically less-developed partners, etc. They are a form of friend-shoring (see Section 4.5).

Unfortunately, the pace of regional/interregional trade and investment integration based on PTAs has slowed since the end of 2010s due to the same protectionist drift that paralyzed global trade negotiations and WTO reform. In January 2017, the Trump administration in the US withdrew from the Trans-Pacific Partnership (TPP) signed a year earlier. Although 11 other signatories from North and South America, East and South East Asia, and the Pacific region decided to continue this deal under a new name (the

Comprehensive and Progressive Agreement for Trans-Pacific Partnership), its trade and economic significance and impact are smaller than the original TPP due to the absence of the most significant partner (the US). The Trump administration also suspended negotiations on another mega-deal—the Transatlantic Trade and Investment Partnership (TTIP) with the EU.

The EU has tried to continue its relatively open trade policy by signing several PTAs with partners in various continents. However, in the early 2020s, its trade liberalization effort has also stalled. The EU–Australia free trade negotiation was suspended in 2023 due to reluctance to open part of the Single European Market to import Australian agriculture products (Sapir 2023). The EU's agriculture protectionism can also be blamed as one of the problems in finalizing the EU–Mercosur Trade Agreement, despite reaching a political agreement between both sides in June 2019 (Dadush and Baltensperger 2019; Demarais 2024).

The African Continental Free Trade Agreement (AfCFTA) (Echandi et al. 2022) and the Regional Comprehensive Economic Partnership (in the Asia-Pacific region)[19] are two large regional PTAs concluded at the end of the 2010s/early 2020s. Even if both are not very deep in their economic contents (focusing primarily on trade in goods), they can help integrate large regional markets and boost economic growth. It is crucial for Africa; however, many other accompanying trade facilitation measures are needed to grasp the full potential benefits of AfCFTA (Echandi et al. 2022; Fofack 2024). The resolution of several violent conflicts is another condition of successful AfCFTA implementation.

Large regional PTAs could create a bridge towards a more straightforward conclusion of global deals under the auspices of the WTO. In the first instance, it would depend on the political readiness of major parties to progress in this direction (which is lacking at the beginning of 2024). However, there are also other, more 'technical' obstacles. First, the existing network of PTAs engages WTO members unequally. Several large EMDEs, such as Bangladesh, India, Nigeria, Pakistan, Russia, and South Africa, participate only marginally in this system. Second, the existing PTAs are incompatible, so finding a common agenda and interest between their participants would be difficult. Third, the unilateral trade preferences granted to developing countries under the Generalized System of Preferences and similar schemes may discourage beneficiary countries from engaging in trade negotiations, which require trade concessions.

The third avenue, market-oriented and macroeconomic stability-enhancing reforms in individual countries, can facilitate further global and regional economic integration and change domestic political economy balances in favor of trade and investment liberalization, as seen in the 1980s and 1990s in several corners of the world (see Section 2). Usually, the focus is on large EMDE players such as China, India, Argentina, Brazil, and South Africa. In particular, China should rethink its industrial policy given its role in the world manufacturing trade. Reducing state aid, increasing openness to foreign investment, better protecting property rights, including intellectual property rights, and eliminating other distortive policies could address at least some of the concerns of its trading and investment partners.

AEs also have an extensive agenda of trade-friendly domestic reforms. They concern not only the most obvious suspect, i.e., agriculture support and its protection against external competition (in the case of the US, EU, Japan, Switzerland, Norway, Iceland, South Korea, and the UK[20]; see IMF et al. 2022). AEs must also mitigate their appetites to conduct industrial policies (see Bown 2023a). They should abandon dreams of reindustrialization, which are inconsistent with the level of their socio-economic development and demographic constraints. They also should assess the fiscal costs of industrial policies (especially when they require subsidies) against the continuous fiscal imbalances and high public debts in most AEs. Similarly, realistic cost–benefit analyses regarding proposals to use trade and investment measures against actual or potential geopolitical adversaries are needed.

6. Summary and Conclusions

After four decades of the second wave of globalization, the world economy and global economic order are at a crossroads. The mounting protectionist pressures in various corners of the world put the perspective of future economic growth and further reduction of extreme poverty and global income inequality (between citizens of the world) under question. These are not temporary frictions caused by unexpected shocks such as the GFC, the COVID-19 pandemic, or the Russian aggression against Ukraine. Unfortunately, they look like a sustainable trend underpinned by the rising wave of populism, nationalism, and geopolitical rivalry. While geopolitical tensions and security concerns serve as a convenient argument for protectionism, the latter may trigger new tensions or magnify existing ones.

Given the benefits of global trade and financial flows and the degree of global economic interdependence, the scenario of far-reaching deglobalization/fragmentation of the sort experienced in the 1930s looks rather unlikely any time soon (unless a worldwide military conflict happens). Instead, economic integration within geopolitical alliances and blocks (friend-shoring) seems more probable. Such a scenario will involve substantial welfare losses due to trade diversion and general equilibrium effects (Cerdeiro et al. 2023). Friend-shoring may also not be a good option for all global trade participants due to their geographic locations or unwillingness to take sides in geopolitical confrontations. It can also lead to higher trade concentration (Seong et al. 2024). Furthermore, history teaches us that geopolitical alliances are not always stable. Therefore, trade and investment choices based on geopolitical considerations may suffer from additional volatility.

The degree of economic and social losses caused by the fragmentation along geopolitical frontiers will depend on how aggressive friend-shoring will be against the existing global trade order. One possibility is a proliferation of PTAs (motivated by geopolitical considerations) within the current WTO regime, as observed since the beginning of the 21st century. Another would be dismantling the existing global trade and investment order and institutions and replacing them with regional or bilateral trade deals. The second scenario would be economically more damaging than the first one.

There is still time to stop the protectionist drift, reform the WTO, and reinforce the existing global economic, trade, and financial order. However, concessions must be made from all sides of international trade disputes. Most countries should return to the path of domestic market-oriented reforms, which provided them and the entire world economy with unquestionable economic benefits in the 1980s, 1990s, and early 2000s and facilitated global trade and financial liberalization. G20 seems to be the best-positioned political forum to agree on the key directions of global trade reform and resisting protectionist drift (as happened in the aftermath of the GFC). The reformed WTO with the support of the IMF and World Bank should play a coordinating role in their implementation.

AEs should reduce their financial support to the agriculture sector and increase the openness of their markets for agricultural goods and labor-intensive services from EMDEs. Due to their economic structures, both are important for developing EMDEs' export capacities. AEs should also abandon dreams of reindustrialization and reject temptations to excessively weaponize trade, investment, and financial policies against their geopolitical adversaries. A rigorous cost–benefit analysis is required each time, as in the case of other policy measures. It is also important to acknowledge that global threats such as global warming or pandemics can be best tackled by well-coordinated global actions based on open markets rather than inward-oriented industrial policies or other beggar-thy-neighbor measures.

EMDEs have an even larger agenda of reforms to reduce further tariff and non-tariff barriers to trade and barriers to foreign investment, abandon import-substitution strategies, improve the rule of law, protect property rights, and strengthen their institutions and governance structures. They lack the resources to subsidize exports, import substitutions, energy prices, etc.

Trade-friendly domestic reforms and concessions in trade negotiations are not easy for obvious political and economic reasons. It takes time to see the benefits of reform, and they are dispersed among broad groups in society. At the same time, costs/sacrifices must

be borne upfront by narrow groups of special interests, usually well-organized. In the ICT revolution era, when the time horizon of political decisions has shortened dramatically, it is more challenging to build a consensus around economic reforms and trade liberalization decisions than it was a few decades earlier. Nevertheless, such a political effort is needed to avoid a slippery slope towards decomposition and fragmentation of the global economy with heavy economic and social losses.

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Notes

1 For the purpose of this essay, we use Wolf's (2005, p. 14) definition of economic globalization as 'the integration of economic activity across borders, through markets'. For a broader discussion of this notion, see, e.g., https://www.piie.com/microsites/globalization/what-is-globalization (accessed on 18 August 2024).

2 Patel et al.'s (2024) analysis, which presents the growth convergenge benefits of hyperglobalization and warns of potential global losses, is one of exceptions.

3 Sachs (2020) distinguishes seven ages of globalization, starting from the Paleolithic Age and ending with the contemporary Digital Age. His periodization is based on technical innovation and refers not only to economic integration. This essay focuses on the role of policies and regulatory regimes in economic integration (although does not abstract from technical and technological factors) and concentrates on the last 150 years.

4 For an overview of technical innovations in the late 19th and 20th centuries and their socio-economic importance—see Gordon (2016).

5 The Spanish–US war in 1898 and the Japanese–Russian war in 1904–1905 were exceptions. However, these were relatively short episodes of limited scale. In addition, Japan, Russia, and Spain played peripheral roles in the world economy at that time.

6 The Smoot–Hawley Tariff Act adopted by the US Congress in June 1930 increased US import tariffs to a record-high level and triggered a global trade war because other countries retaliated (see Mitchener et al. 2022).

7 See https://www.wto.org/english/thewto_e/whatis_e/tif_e/fact4_e.htm (accessed on 18 August 2024).

8 The data for EMDEs are available from 1997 only.

9 PTAs have both trade creation and trade diversion effects. If the latter is stronger than former, the net effect is negative. However, even if the net effect is positive, PTAs are the second-best solution when compared to global trade liberalization. Bhagwati (2008) calls them 'termites in the trading system'.

10 See https://tron.trade.ec.europa.eu/investigations/ongoing (accessed on 14 June 2024).

11 See https://ec.europa.eu/commission/presscorner/detail/en/ip_24_3231 (accessed on 18 August 2024).

12 See, e.g., https://webapi2016.eesc.europa.eu/v1/documents/eesc-2013-06859-00-00-ac-tra-en.doc/content (accessed on 18 August 2024).

13 This essay does not have the ambition to offer a comprehensive assessment of policy responses to the COVID-19 pandemic and speculate whether there were other, better responses. The focus is only on the impact of adopted policies on protectionist sentiments and specific arguments used in the policy debate.

14 The 1990s were not free from violent conflicts, for example, in the former Yugoslavia and many corners of Africa. However, they were isolated, involved countries with negligible shares of global output, and did not negatively impact international economic cooperation and governance.

15 In 2022, China accounted for 18.4% of the world GDP in PPP terms, while Russia accounted for 2.9%. China's share of the world exports of goods and services amounted to 11.9%, and Russia's share amounted to 1.8% (IMF 2023, Table A, p. 99).

16 Hufbauer et al. (2022) argued that a trade liberalization package amounting to 2 percentage points of a tariff-equivalent reduction (mainly reversal of the import tariff increases of the Trump administration) could offer a one-off reduction of US inflation by ca. 1.3 percentage points.

17 The US' objections were articulated, among others, by the US Trade Representative (2020).

18 See https://www.wto.org/english/thewto_e/minist_e/mc12_e/briefing_notes_e/bfwtoreform_e.htm (accessed on 18 August 2024).

19 See https://www.dfat.gov.au/trade/agreements/in-force/rcep (accessed on 18 August 2024).

20 Among EMDEs, India and Kazakhstan account for the largest budgetary support to agriculture calculated in % of gross farm receipts (IMF et al. 2022).

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