

Article

Fiscal and Monetary Dominance in the Visegrad Group: Evidence from Regime Heterogeneity

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Abstract

Although coordinating fiscal and monetary policy is essential for stabilizing small and globally exposed economies, researchers frequently oversimplify by treating the Visegrad Group (V4) as a uniform entity. This study investigates whether the Czech Republic, Hungary, Poland, and Slovakia are converging toward a unified macroeconomic standard or diverging due to institutional heterogeneity. Employing a hybrid framework combining Markov Regime-Switching Vector Autoregressive (MS-VAR) and single-regime robust OLS models alongside dynamic Impulse Response Functions (IRFs) on quarterly data from 2010 to 2024, the research estimates policy reaction functions to identify active and passive stances across the region. Empirical results suggest considerable regime heterogeneity. The Czech Republic and Poland demonstrate stable, single-regime monetary dominance grounded in strict Ricardian fiscal discipline. Conversely, Hungary exhibits structural fiscal dominance and severe institutional conflict, resulting in forced, high-volatility monetary tightening. Slovakia demonstrates persistent fiscal dominance but avoids macroeconomic destabilization because the market discipline provided by its Eurozone membership is economically negligible. The findings indicate that a country's institutional setup and approach to monetary integration dictate its resilience to external shocks. This confirms that the V4 nations possess deep, underlying macroeconomic divergence.

Keywords: fiscal dominance; monetary policy; Markov-Switching VAR; Visegrad Group; Eurozone integration; small open economies



Academic Editor: Robert Czudaj

Received: 6 June 2026

Revised: 4 July 2026

Accepted: 10 July 2026

Published: 15 July 2026

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1. Introduction

The interaction between fiscal and monetary policy remains a central determinant of macroeconomic stability, particularly for small, open economies dealing with regional integration and global volatility. Over the past decade, overlapping exogenous shocks, specifically the macroeconomic disruptions of the COVID-19 pandemic, the European energy crisis, and acute geopolitical conflicts, have substantially tested the resilience of these frameworks. Mainstream macroeconomic models often assume monetary dominance, with independent central banks anchoring inflation expectations while fiscal policy quietly adjusts budgets to keep debt sustainable. Recent regional experience, however, shows that these economies are highly vulnerable when the balance of power between monetary and fiscal policy shifts under the weight of such external crises.

Despite sharing a regional identity and historically synchronous business cycles, the countries of the Visegrad Group (V4), the Czech Republic, Hungary, Poland, and Slovakia, show significant institutional and macroeconomic heterogeneity. This divergence is most distinctly characterized by their respective Eurozone integration paths: Slovakia operates within the Economic and Monetary Union (EMU), effectively delegating its monetary policy to the European Central Bank, whereas the Czech Republic, Poland, and Hungary maintain independent central banks and floating exchange rates, although with varying approaches to regulatory convergence. Recent empirical evidence from Hungary (Salimi et al., 2026) indicates that a regime of fiscal dominance, characterized by non-Ricardian behavior that fails to respond to debt accumulation, can become firmly established. As a result, the entire burden of macroeconomic stabilization during exogenous shocks shifts onto monetary policy. However, it remains underexplored whether this phenomenon is unique to specific institutional contexts or if similar regime-switching dynamics characterize the broader Visegrad region.

To answer this question, this study broadens the analytical scope to conduct a comparative assessment of fiscal and monetary dominance across the entire Visegrad Group. Building on recent theoretical advancements, this paper employs a hybrid analytical framework combining Markov Regime-Switching Vector Autoregressive (MS-VAR) models for economies exhibiting structural breaks, and single-regime robust reaction functions for highly stable institutional environments. While previous regional studies have largely relied on static coefficient estimates or isolated single-country analyses, applying this non-linear, dynamic approach simultaneously across four institutionally heterogeneous nations represents a significant methodological leap for the literature. Through focusing on dynamic shock transmission instead of static regime identification, this research aims to identify distinct periods of active and passive policy stances across the bloc. The central objective is to determine whether the V4 countries are converging toward a unified macroeconomic policy standard or whether differing institutional environments and multiple external shocks are reinforcing structural regime heterogeneity.

2. Literature Review

2.1. Theoretical Background: Discussing Fiscal and Monetary Dominance

The theoretical cornerstone for analyzing the interplay between government and central bank actions rests on the “active-passive” policy matrix and the broader debate between monetary and fiscal dominance. Conventional macroeconomic theory historically prioritizes the framework of monetary dominance. Under this Ricardian model, an autonomous central bank dictates monetary conditions, frequently via a standard Taylor rule, to anchor inflation. Meanwhile, the fiscal authority acts reactively by tuning primary budget balances to guarantee long-term solvency. Such rule-bound stability assumes a distinct separation of responsibilities, where the central bank regulates nominal variables and the fiscal branch adjusts internally to rising debt to maintain budgetary viability (Leeper, 1991; Bohn, 1998). While this conventional approach mirrors the New-Keynesian focus on anchoring inflation expectations, post-Keynesian frameworks highlight systemic financial vulnerabilities that necessitate tight, cooperative policy interaction during deep structural crises (Salimi et al., 2025a). However, this entire orthodox structure faces a direct challenge from the Fiscal Theory of the Price Level (FTPL), popularized by Sims (1994), Buiter (2002), and Cochrane (2001). The FTPL maintains that under particular institutional environments, government spending and deficits are driven exogenously, effectively forcing monetary authorities to absorb the resulting budgetary imbalances. In a Fiscal Dominance (FD) regime, it is the stance of fiscal policy that drives macroeconomic dynamics and determines the price level. This forces the central bank to abandon its inflation target to accommodate the fiscal

imbalance and prevent sovereign default, a scenario [Sargent and Wallace \(1981\)](#) famously termed “unpleasant monetarist arithmetic”.

While these frameworks were originally developed for large economies, their application to small open economies, such as those in Central Europe, requires significant modification. The policy trilemma—or the impossible trinity—places definitive boundaries on how fiscal and monetary policymakers interact within a small open economy, according to the foundational Mundell-Fleming framework ([Mundell, 1963](#); [Fleming, 1962](#)). The impossible trinity dictates that high capital mobility and independent monetary policy lead to extreme exchange rate vulnerability. When a country operates with a floating exchange rate, unchecked fiscal dominance and unsustainable deficits can trigger rapid capital outflows. Consequently, external constraints heavily influence regime dominance. In such environments, a central bank’s shift from a passive to an active regime is frequently not an internal policy choice but a forced activism to defend the currency against external shocks. As a result, central bank interventions become tied to the sovereign risk premium instead of addressing internal economic conditions.

2.2. Methodological Evolution: From Static Rules to Regime-Switching Models

The empirical evaluation of policy dominance has evolved significantly over the past two decades. Early studies predominantly utilized linear reaction functions to evaluate whether policies acted in coordination or conflict. By estimating standard Taylor rules and debt-stabilization functions using linear Vector Autoregression (VAR), researchers sought to classify countries into static active or passive states. While these foundational linear models provided baseline insights into leader-follower relationships, they are severely limited when applied to economies that experience profound structural breaks. Because parameters are fixed, standard VARs fail to capture the non-linear realities of policy behavior and endogenous changes during extreme economic turbulence. ([Davig et al., 2006](#); [Sims & Zha, 2006](#)).

To address these analytical limitations, modern macroeconomic research has progressively transitioned toward regime-dependent methodologies. Markov-Switching Vector Autoregression (MS-VAR) models allow policy reaction coefficients and error variances to shift endogenously between unobserved states (e.g., switching from a “stable/passive” regime to a “volatile/active” one). Brought to prominence by [Hamilton \(1996\)](#) and further developed by [Krolzig \(1997\)](#) and [Filardo \(1994\)](#), these sophisticated models successfully integrate state transition probabilities derived from real-world economic metrics. This capacity makes them an indispensable tool for analyzing financial systems that experience abrupt institutional restructuring. Furthermore, capturing state-dependent Impulse Response Functions (IRFs) within these models reveals that the transmission mechanism of an economic shock alters fundamentally depending on the prevailing dominance regime, a dynamic nuance that is completely lost in static linear estimates.

2.3. Macroeconomic and Institutional Heterogeneity in the Visegrad Group

While the Visegrad Group (V4), comprising the Czech Republic, Hungary, Poland, and Slovakia, is frequently analyzed as a cohesive geopolitical bloc that successfully navigated post-communist transition and Europeanization ([Mogildea, 2018](#)), this unified exterior masks profound internal regime heterogeneity ([Rozmahel et al., 2013](#)). Treating the V4 as a homogeneous macroeconomic entity is theoretically flawed given their diverging political and institutional trajectories. As [Magyar and Madlovics \(2022\)](#) point out, post-communist states cannot be grouped uniformly; the V4 countries have diverged into distinct political economies characterized by varying degrees of patronal democracy and autocracy. These political structures dictate the degree of central bank independence and the likelihood of

economic policy being subordinated to political elite objectives, which directly fuels fiscal dominance.

This heterogeneity is deeply compounded by their monetary architectures. Slovakia's integration into the Eurozone effectively ceded its monetary sovereignty to the European Central Bank (ECB) (Bénassy-Quéré, 2015), making it a unique outlier within the V4. Slovakia relies strictly on domestic fiscal policy for local stabilization, facing the constraints of a uniform monetary policy that alters its shock absorption capabilities. In contrast, the Czech Republic, Hungary, and Poland retain national currencies and independent inflation-targeting regimes, exposing their economies to the volatility of flexible exchange rates and the pressure of legal and nominal convergence (Nowak-Far, 2024).

Profound structural differences also exist at the fiscal level. Cluster analyses highlight significant divergence in government expenditure, with distinct welfare models and social protection priorities emerging across the V4 (Piekut & Rybaltowicz, 2024). These differences in state spending priorities dictate the non-linear limits of public debt thresholds and determine how aggressively fiscal policy impacts national welfare (Dragos et al., 2025). Furthermore, the degree of fiscal decentralization within these countries serves as a key variable influencing regional development and the overall efficacy of national fiscal policy (Buriachenko et al., 2022).

2.4. Empirical Evidence on Policy Dominance in Central Europe

Historical empirical assessments of the Visegrad Group generally painted a picture of coordinated, monetary-led stabilization. Analyzing early transition periods, Kappel and Janků (2014) utilized reaction functions and game theory to establish that monetary policy played a stabilizing, counter-cyclical role across the V4. Additional statistical evidence pointing to clear monetary dominance in the Czech Republic and Poland (Janků & Kappel, 2014). Conversely, even in these early assessments, Hungary frequently leaned toward fiscal dominance, driven by pro-cyclical government spending and structural debt accumulation.

Contemporary research focusing on the post-2010 and post-pandemic eras indicates a dramatic regime shift across the bloc. Contemporary research focusing on the post-2010 and post-pandemic eras indicates a dramatic regime shift across the bloc. Recent comparative studies emphasize that despite their shared transition history, Central and Eastern European countries have exhibited parallel processes but highly divergent macroeconomic outcomes and varied institutional responses to recent global shocks (Chepurenko & Szanyi, 2022). This post-2020 systemic heterogeneity is increasingly interpreted through a 'varieties of capitalism' lens. This perspective illustrates that the V4 nations operate under distinctly different path-dependent development models that fundamentally alter how they react to exogenous crises (Gräbner-Radkowsch, 2023; Rosta, 2022). Studies utilizing Structural VAR to calculate government spending multipliers found that fiscal expansion has an unusually large impact in the region, with long-term multipliers exceeding unity in Hungary and Poland, incentivizing pro-cyclical fiscal behavior (Baranowski et al., 2016; Bartha & Matarrese, 2024; Haug et al., 2019). This pro-cyclicality has severely disrupted monetary coordination. Evaluating this dynamic through a Nash equilibrium framework demonstrates that the lack of cooperative strategies between fiscal and monetary authorities directly amplifies the macroeconomic impact of external shocks (Salimi et al., 2025b, 2025c). Indeed, recent applications of MS-VAR models to the Hungarian economy proved that it has predominantly operated under a state of high-volatility fiscal dominance over the last decade. The fiscal authority exhibited persistent non-Ricardian behavior, forcing the central bank, which had accommodated the government during stable growth periods, into an aggressive, forced active tightening regime to combat spiraling inflation (Salimi et al., 2026).

2.5. Exogenous Shocks, Economic Policy Uncertainty, and Inflation Dynamics

The friction between fiscal and monetary authorities in the V4 has been deeply exacerbated by the global polycrisis of the 2020s. Macroeconomic stability in small open economies is frequently dictated by exogenous shocks rather than domestic policy preferences. Significant disruptions from the COVID-19 pandemic, followed closely by the European energy shock, triggered record highs in Economic Policy Uncertainty (EPU) throughout the Visegrad region (Asad et al., 2024).

These extreme macroeconomic turbulences significantly impacted corporate debt levels, sovereign fiscal space, and inflation dynamics (Gajdosikova et al., 2025). While domestic factors heavily influence long-run inflation trends, the severe short-term inflation surges across the V4 were predominantly driven by external global price factors and supply chain disruptions (Kjosevski, 2025). Because the V4 are highly exposed to global trade dynamics and external funding mechanisms, domestic policy dominance is frequently overridden by external financial conditions. In this environment, a surge in global risk sentiment can abruptly disrupt nominal anchors, forcing a rapid switch from an accommodative monetary regime to a highly active one, regardless of the domestic business cycle.

2.6. Synthesis and Identified Gaps

The current literature provides robust evidence that the Visegrad Group is characterized by increasing institutional, political, and macroeconomic divergence (Haynes & Haynes, 2016; Scott, 2022). While historical studies broadly identified coordinated monetary dominance across the bloc, recent advanced econometric applications suggest a dangerous pivot toward uncoordinated fiscal dominance and forced monetary activism in the face of external shocks.

However, a critical methodological gap remains. Most comparative regional studies still rely on static coefficient estimates or linear VARs that fail to capture the dynamic propagation of shocks across different regimes. Conversely, while highly advanced MS-VAR applications have recently been utilized to expose the structural nature of fiscal dominance in single-country contexts, such as Hungary, this non-linear methodology has not yet been systematically applied to a comparative analysis of the entire Visegrad bloc.

It remains unknown if the Czech Republic and Poland experienced identical MS-VAR regime probabilities during recent crises, or if Slovakia's Eurozone membership shielded it from, or exacerbated these dominance shifts. This study directly addresses this gap. By applying a hybrid framework combining MS-VAR and robust single-regime models across all four Visegrad economies, this paper systematically compares how identical external shocks interacted with heterogeneous domestic institutions. In doing so, this research moves beyond static linear classifications, offering a dynamic map of policy dominance that challenges the macroeconomic cohesiveness of the V4 and provides critical insights for monetary integration in Central Europe.

3. Methodology

3.1. Overview of the Analytical Approach

This research provides an empirical evaluation of the occurrence, timeline, and dynamic propagation of monetary and fiscal dominance phases within the Visegrad Group (V4) over the 2010 to 2024 period. To evaluate the diverse macroeconomic environments across the Visegrad Group, we employ a hybrid econometric framework combining a Markov Regime-Switching Vector Autoregressive (MS-VAR) approach for countries with structural breaks, alongside single-regime robust models for economies demonstrating continuous institutional stability. Expanding upon recent single-country applications, this comparative approach estimates distinct models for the Czech Republic, Hungary, Poland,

and Slovakia. Unlike static linear VARs, the MS-VAR framework allows reaction coefficients and error variances to shift endogenously between unobserved “active” and “passive” states. Given the macroeconomic heterogeneity of the V4, the methodology establishes a baseline open-economy model for the countries retaining independent monetary policy, the “V3” (Czech Republic, Hungary, and Poland), while employing a structurally adapted model for Slovakia to reflect its Eurozone integration.

3.2. Data Selection and Model Variables (Baseline V3 Model)

The quantitative assessment relies on a quarterly time series covering the period from 2010Q1 to 2024Q4, with variables extracted from the respective national statistical offices, Eurostat, and the European Central Bank (ECB). Because the sample size is small, we must strictly limit the number of variables to prevent overparameterizing the model. For the independent currency nations (Czech Republic, Hungary, Poland), the baseline endogenous vector consists of six variables:

- Real GDP (Y_t): Captures aggregate output and the domestic business cycle. The output gap used in the reaction functions was constructed by extracting the cyclical component from the real GDP series using a Hodrick-Prescott (HP) filter.
- Inflation (π_t): The quarterly growth rate of the Harmonized Index of Consumer Prices (HICP), expressed on an annualized basis.
- Central Bank Policy Rate (R_t): Serves as the primary indicator for the monetary authority’s current policy positioning.
- Primary Budget Balance (PB_t): % of GDP, this metric isolates the fiscal authority’s discretionary budgetary decisions.
- Public Debt (D_t): % of GDP, indicating the long-run viability and risk of government debt levels.
- Exchange Rate (Er_t): Log of the national currency per EUR exchange rate to capture external vulnerabilities and open-economy constraints.

Data Transformation and Stationarity: In order to avoid spurious regressions, each time series was evaluated for unit roots via the Augmented Dickey–Fuller (ADF) procedure. Consequently, variables exhibiting non-stationarity in their level forms, specifically policy rates, inflation, and public debt ratios, are integrated into the framework as first differences (Δ).

ExternalControls (X_t): The model incorporates exogenous factors to clearly distinguish local policy movements from worldwide volatility. This includes Brent oil prices to act as a proxy for supply shocks, as well as a crisis dummy variable to mark the acute instability periods of the COVID-19 lockdowns and the war in Ukraine.

3.3. Econometric Framework

The primary analytical structure relies on a regime-switching Vector Autoregression of order p , in which the model parameters fluctuate based on a discrete, hidden state variable $s_t \in \{0, 1\}$:

$$Y_t = A_{s_t} + \sum_{i=1}^p B_{i,s_t} Y_{t-i} + CX_t + \epsilon_{t,s_t} \quad (1)$$

In this specification, Y_t denotes the set of endogenous macroeconomic indicators, while A_{s_t} and B_{i,s_t} signify the regime-shifting intercepts and autoregressive parameters, respectively. The term CX_t accounts for purely exogenous external disruptions, and $\epsilon_{t,s_t} \sim N(0, \Sigma_{s_t})$ indicates the state-dependent error vectors. The hidden state variable, s_t , transitions based on a first-order Markov chain featuring constant probabilities, expressed as $P(s_t = j \mid s_{t-1} = i) = p_{ij}$. For each nation within the V4, the optimal lag order (p) is independently identified utilizing the Schwarz Bayesian Information Criterion (BIC). Because our dataset is relatively small, the BIC was specifically selected over the AIC

due to its stricter penalization of additional variables, which is critical for preventing the overparameterization of this intricate regime-shifting framework.

3.4. Regime-Dependent Policy Reaction Functions

To structurally identify whether an economy is operating under monetary or fiscal dominance, we estimate conditional, regime-dependent reaction functions embedded within the MS-VAR system. Because the data are transformed into first differences, these functions evaluate marginal policy activism.

- Monetary Policy (Taylor Rule Equivalent):

$$\Delta R_t = \alpha_{s_t} + \beta_{1,s_t} \Delta \pi_{t-1} + \beta_{2,s_t} \text{Gap}_{t-1} + \sum_{k=1}^K \beta_{k,s_t} \Delta Y_{t-k} + \eta_{t,s_t} \quad (2)$$

- Fiscal Policy (Debt Sustainability Rule):

$$\Delta PB_t = \gamma_{s_t} + \delta_{1,s_t} \Delta D_{t-1} + \delta_{2,s_t} \text{Gap}_{t-1} + \sum_{k=1}^K \delta_{k,s_t} \Delta Y_{t-k} + \nu_{t,s_t} \quad (3)$$

Regime Identification Criteria: Monetary Dominance: Identified if the central bank adheres to the Taylor Principle ($\beta_1 > 0$), while the fiscal authority behaves in a Ricardian manner, consolidating the balance in response to rising debt ($\delta_1 > 0$).

Fiscal Dominance: Identified if the fiscal authority ignores debt constraints (non-Ricardian behavior where $\delta_1 \leq 0$), forcing the central bank to abandon aggressive inflation targeting or accommodate the resulting volatility.

3.5. Identification Strategy and Impulse Response Analysis

Relying solely on static coefficients can obscure the persistent effects of economic disturbances in small open economies. Therefore, we complement the reaction functions with state-dependent Impulse Response Functions (IRFs). To orthogonalize the structural shocks, we employ a recursive Cholesky decomposition.

The variables are ordered based on their assumed speed of adjustment: (Output $\rightarrow$ Inflation $\rightarrow$ Fiscal Balance $\rightarrow$ Debt $\rightarrow$ Interest Rate $\rightarrow$ Exchange Rate). This ordering assumes that policy instruments (PB_t, R_t) can react to output and inflation shocks within the same quarter, but macroeconomic variables respond to policy adjustments only with a one-period lag. This recursive ordering is grounded in standard open-economy macroeconomic theory, which posits that real sector variables (output and inflation) react sluggishly to shocks due to nominal rigidities. In contrast, policy instruments and financial markets (exchange rates and spreads) can adjust rapidly to output and inflation shocks within the same quarter.

3.6. Estimation Procedure

The estimation of transition matrices, parameters, and state probabilities across all models is conducted iteratively via Maximum Likelihood (ML) utilizing the Expectation-Maximization (EM) algorithm. Regime assignment is subsequently determined using full-sample smoothed probabilities; any quarter yielding a probability greater than 0.5 is categorized accordingly into Regime 0 or Regime 1. Furthermore, the successful convergence of the maximum likelihood estimates and the clear, stable separation of these smoothed probabilities, without erratic switching, indicate that our sample size is sufficient to support the estimated parameters.

3.7. Slovak Republic: A Currency Union Adaptation

While the methodological framework applied to Hungary, Poland, and the Czech Republic follows a unified MS-VAR specification, the Slovak Republic requires a structural adaptation grounded in its distinct institutional context. Slovakia adopted the euro on 1 January 2009, thereby permanently giving up independent monetary policy and losing the exchange rate as a macroeconomic stabilization instrument.

Theoretical Justification: Within the Fiscal Theory of the Price Level, fiscal dominance in a country with an independent central bank emerges through monetary accommodation. In a currency union member, this transmission channel is structurally closed. The ECB sets the monetary policy stance for the entire Eurozone. Consequently, a non-Ricardian Slovak fiscal authority cannot rely on domestic monetary accommodation or exchange rate depreciation to resolve unsustainable debt dynamics. Instead, the consequences of fiscal dominance shift directly to sovereign bond markets, resulting in higher risk premiums and more expensive borrowing costs compared to the Eurozone benchmark.

Variable Specification: Given these constraints, the domestic policy rate and the nominal exchange rate are removed from the endogenous system. In their place, two substitutions are introduced:

Exogenous Monetary Control: The ECB main refinancing operations (MRO) rate enters the model as an exogenous control variable, preserving the influence of monetary conditions while correctly treating them as externally determined.

Endogenous Risk Premium: The Slovakia–Germany 10-year sovereign bond yield spread is introduced as a new endogenous variable to serve as the primary market-based indicator of fiscal stress. Due to data harmonization constraints, the annual spread data were linearly interpolated to match the quarterly frequency of the VAR. We acknowledge this interpolation as a methodological limitation, as it inherently smooths short-term market dynamics and dampens high-frequency volatility.

The adapted endogenous variable vector for Slovakia is therefore:

$$Y_t = [\Delta GDP_t, \Delta \pi_t, \Delta PB_t, \Delta D_t, Spread_t] \quad (4)$$

With exogenous controls:

$$X_t = [ECB_Rate_t, Brent_Oil_t, Crisis_Dummy_t] \quad (5)$$

Adapted Reaction Functions and Interpretation: The fiscal sustainability reaction function estimated for Slovakia is structurally identical to that of the V3. If the estimated coefficient on lagged debt ($\delta_{1,s,t}$) is statistically insignificant across both regimes, it constitutes evidence of non-Ricardian fiscal behavior, a finding that carries greater macroeconomic consequence for Slovakia precisely because no domestic monetary authority exists to absorb the stabilization burden. Because Slovakia does not control its own interest rates, we cannot estimate a domestic monetary policy rule for the country. The monetary dimension of the dominance analysis is instead captured indirectly through the Cholesky ordering (Output → Inflation → Fiscal Balance → Debt → Bond Spread), where the response of the sovereign spread serves as the empirical counterpart to the monetary accommodation channel.

Rather than representing a transition between passive and active monetary stances, the Slovak regimes capture a transition between two fiscal states:

Regime 0 (Stable Fiscal Dominance): Low bond spread volatility, contained primary balance fluctuations, and stable debt dynamics. Fiscal policy remains non-Ricardian but operates within market-tolerated bounds.

Regime 1 (Stressed Fiscal Dominance): Rising sovereign spreads, high fiscal variance, and deteriorating primary balances, such conditions emerge when markets price in a high risk of fiscal failure due to the lack of a domestic monetary backstop.

3.8. Diagnostic Criteria and Single-Regime (OLS) Fallback Specification

While the Markov Regime-Switching Vector Autoregressive (MS-VAR) framework serves as the primary analytical tool for identifying policy dominance, the successful estimation of state-dependent transition probabilities inherently relies on the presence of sufficient macroeconomic volatility and structural breaks within the data series. In highly stable institutional environments, forcing an MS-VAR estimation can lead to model misspecification or algorithm failure.

To ensure econometric robustness, this methodology defines two specific and pre-established diagnostic criteria under which the baseline MS-VAR framework is rejected in favor of a single-regime, robust Ordinary Least Squares (OLS) specification:

Matrix Singularities due to Lack of Variance: Maximum Likelihood (ML) estimation of MS-VAR models requires sufficient volatility across all specified states. If a given macroeconomic series or policy instrument exhibits extended periods of near-zero variance, the estimation algorithm may fail to converge due to matrix singularities.

Non-Persistent Regimes: A core assumption of the Markov-switching framework is that identified regimes represent persistent macroeconomic states. If the estimation yields a transition probability that is statistically indistinguishable from zero (i.e., $P(s_t = j | s_{t-1} = i) \approx 0$), it indicates that the alternate state lacks sufficient persistence to be classified as a distinct regime.

In instances where either of these diagnostic thresholds is triggered, the regime-switching mechanics are collapsed. The policy reaction functions are subsequently estimated using single-regime OLS regressions, augmented with the same exogenous crisis controls (X_t) to isolate domestic policy from global shocks.

For the monetary and fiscal authorities, the fallback single-regime specifications are defined as:

- Single-Regime Monetary Policy (Taylor Rule):

$$\Delta R_t = \alpha + \beta_1 \Delta \pi_{t-1} + \beta_2 \text{Gap}_{t-1} + \sum_{k=1}^K \beta_{k+2} \Delta Y_{t-k} + C X_t + \eta_t$$

- Single-Regime Fiscal Policy (Debt Sustainability Rule):

$$\Delta PB_t = \gamma + \delta_1 \Delta D_{t-1} + \delta_2 \text{Gap}_{t-1} + \sum_{k=1}^K \delta_{k+2} \Delta Y_{t-k} + C X_t + v_t$$

For the Slovak Republic, should the fiscal or market spread data trigger the single-regime criteria, the adapted market discipline fallback specification is defined as:

- Single-Regime Market Discipline (Slovakia):

$$\text{Spread}_t = \theta + \phi_1 \Delta D_{t-1} + \phi_2 \text{Gap}_{t-1} + \phi_3 \Delta \text{ECB}_t + \epsilon_t$$

By establishing this OLS fallback specification, the methodology ensures that structural stability is accurately modeled as a continuous institutional state, rather than imposing a volatile regime-switching framework onto stable data.

4. Results

4.1. Regional Overview and Harmonized Results

Our empirical analysis evaluates the interactions between fiscal and monetary policies across four Central European economies between 2010 and 2024. Preliminary variance diagnostics revealed that the Visegrad Group does not operate under a uniform macroeconomic paradigm. Instead, the region fractures into three distinct institutional frameworks: highly stable Monetary Dominance (the Czech Republic and Poland), regime-switching institutional conflict (Hungary), and Eurozone-shielded persistent Fiscal Dominance (Slovakia).

To establish a comparative baseline, Table 1 provides harmonized descriptive statistics. The raw data immediately highlight the regional divergence, specifically the severe macroeconomic oscillations and high inflation variance in Hungary compared to the relative stability of its regional peers.

Table 1. Harmonized Descriptive Statistics across Central European Economies (2010–2024).

Variable	Hungary (Regime 0) (Passive/Stable)	Hungary (Regime 1) (Active/Crisis)	Czech Republic (Single Regime)	Poland (Single Regime)	Slovakia (Persistent Dominance)
Inflation (Annualized %)	1.57 (1.41)	9.00 (7.56)	3.52 (4.25)	3.46 (3.99)	3.13 (3.79)
GDP Growth (YoY %)	3.90 (1.44)	1.44 (6.00)	1.87 (2.98)	3.47 (3.02)	2.57 (2.75)
Budget Balance (% GDP)	−2.21 (2.62)	−6.46 (4.35)	−2.07 (2.41)	−3.62 (2.70)	−3.56 (2.12)
Base Rate/Market Spread (%)	1.69 (1.23)	6.02 (4.83)	1.69 (2.32)	2.91 (1.97)	1.00 (0.77)
Exchange Rate (to EUR)	311.48 (8.98)	375.56 (20.76)	25.75 (1.05)	4.31 (0.19)	N/A (Eurozone)

Note: Values represent the Mean, with Standard Deviation in parentheses. N/A indicates not applicable due to Slovakia's Eurozone membership.

To evaluate the institutional anchors driving this divergence, Tables 2 and 3 present the unified fiscal and monetary reaction functions across the bloc.

Table 2. Unified Fiscal Policy Reaction Functions (Response of Primary Balance to Lagged Debt).

Variable: Lagged Debt ($\Delta Dt-1$)	Hungary (Benchmark)	Slovakia (Eurozone Shield)	Czech Republic	Poland
Model Specification	MS-VAR (2-Regime)	OLS (Single-Regime)	OLS (Single-Regime)	OLS (Single-Regime)
Regime 0 (Stable/ Passive)	−0.455 (0.684)	--	--	--
Regime 1 (Volatile/ Active)	−0.396 (0.451)	--	--	--
Single-Regime Estimate	--	−0.338 * (0.206)	0.820 *** (0.258)	0.872 *** (0.260)
Output Gap (y_{t-1})	0.122	0.046 ***	0.294 ***	0.261 **

Note: Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Output gap coefficients represent the non-switching or dominant regime estimates.

Table 3. Unified Monetary and Market Reaction Functions.

Reaction Variable	Hungary (Taylor Rule) Resp. to Inflation ($\Delta\pi_t$)	Czech Rep. (Taylor Rule) Resp. to Inflation ($\Delta\pi_t$)	Poland (Taylor Rule) Resp. to Inflation ($\Delta\pi_t$)	Slovakia (Market Rule) Spread Resp. to Debt ($\Delta Dt-1$)
Regime 0	0.050 * (0.026)	--	--	−0.092 (0.060)
Regime 1	0.432 *** (0.083)	--	--	0.080 *** (0.027)
Single-Regime	--	0.152 *** (0.044)	0.221 *** (0.044)	--

Note: Standard errors in parentheses. * $p < 0.10$, *** $p < 0.01$.

As visually evidenced by these harmonized estimates, the region is starkly divided. The Czech Republic and Poland demonstrate robust Ricardian discipline (tightening the primary balance in response to debt), allowing their central banks to actively target inflation unburdened by sovereign solvency concerns. Conversely, Hungary and Slovakia operate under structural non-Ricardian frameworks (displaying negative or insignificant reactions to debt accumulation). However, as the subsequent country-specific dynamic analyses will demonstrate, differing monetary architectures, specifically Slovakia's Eurozone integration, create vastly different macroeconomic consequences for this fiscal dominance.

4.2. The Anchors of Monetary Dominance: Czech Republic and Poland

Before implementing the single-regime robust OLS models for the Czech Republic and Poland, we rigorously tested Markov-Switching models on these economies. However, diagnostic checks indicated severe econometric misspecifications when forcing a regime-switching framework onto these highly stable environments. Specifically, estimating the monetary models resulted in matrix singularities. This was driven by an extended lack of variance in policy rates, notably caused by the Czech National Bank's zero-lower-bound period and the National Bank of Poland maintaining a flat reference rate for multiple years. Furthermore, the fiscal MS-VAR estimations failed to identify persistent alternative regimes, instead yielding transition probabilities approaching zero or overfitting to single-quarter outliers. Because the data inherently lacks the persistent state-switching volatility necessary to invert the Markov matrices, these diagnostic realities strictly justified the switch to single-regime OLS models to accurately capture the continuous institutional stability of these nations.

4.2.1. The Czech Republic: Single-Regime Stability

As detailed in Table 4, the estimation results for the Czech fiscal sustainability rule provide clear evidence of a highly disciplined, Ricardian fiscal authority.

Table 4. Single-Regime Fiscal Policy Reaction Function (Czech Republic).

Variable	Coefficient	Std. Error	t-Statistic	p-Value
Constant	0.0875	0.256	0.342	0.734
Lagged Debt ($\Delta Dt-1$)	0.8204 ***	0.258	3.178	0.002
Output Gap (y_{t-1})	0.2941 ***	0.081	3.624	0.001
Crisis Dummy	−0.5173	0.493	−1.049	0.299

Note: $R^2 = 0.259$, F-statistic p -value = 0.0009. *** $p < 0.01$.

The reaction coefficient to lagged debt is positive, substantial (0.8204), and highly significant ($p = 0.002$). In direct contrast to non-Ricardian behavior, when Czech public debt rises, the government systematically tightens the primary balance to stabilize debt accumulation. Because the fiscal authority is highly disciplined, the Czech National Bank faces minimal pressure from sovereign solvency concerns.

Table 5 details the results of the Czech National Bank's monetary reaction function. The monetary estimation confirms an active, independent central bank. The coefficient for inflation acceleration is positive (0.1526) and highly significant ($p = 0.001$). While below the classical Taylor Principle threshold, this indicates short-run monetary responsiveness rather than absolute monetary dominance, showing that the central bank systematically hikes interest rates to combat rising price levels (Figure 1).

Table 5. Single-Regime Monetary Reaction Function (Czech Republic).

Variable	Coefficient	Std. Error	t-Statistic	p-Value
Constant	0.0725	0.083	0.878	0.384
Inflation ($\Delta\pi_t$)	0.1526 ***	0.044	3.488	0.001
Output Gap (y_{t-1})	0.0529 **	0.026	2.029	0.047
Crisis Dummy	−0.0709	0.151	−0.469	0.641

Note: $R^2 = 0.299$, F-statistic p-value = 0.0002. ** $p < 0.05$, *** $p < 0.01$.

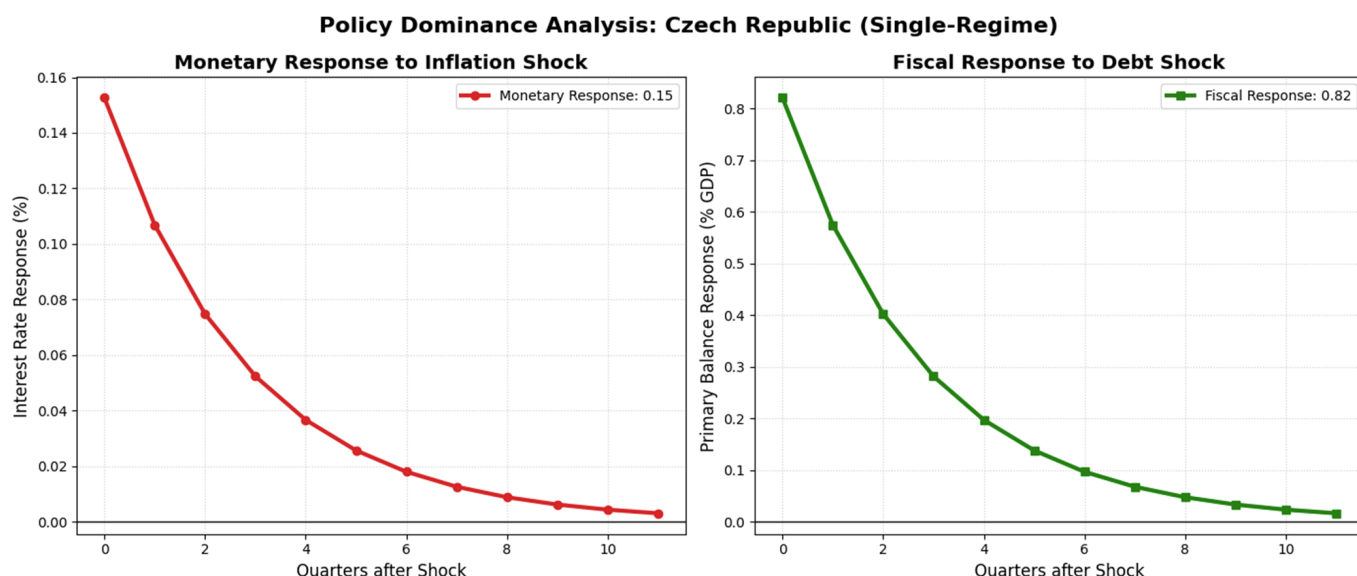


Figure 1. Impulse Response Functions for the Czech Republic. The left panel displays the response of the base interest rate to a 1% inflation shock. The right panel displays the response of the primary fiscal balance to a 1% debt-to-GDP shock. Both panels demonstrate robust, stable stabilization dynamics indicative of Monetary Dominance.

4.2.2. Poland: Aligned Institutional Discipline

The macroeconomic profile of Poland closely mirrors the stability observed in the Czech Republic. Table 6 confirms that the Polish fiscal authority operates under a similarly disciplined, Ricardian framework.

Table 6. Single-Regime Fiscal Policy Reaction Function (Poland).

Variable	Coefficient	Std. Error	t-Statistic	p-Value
Constant	0.1487	0.407	0.365	0.716
Lagged Debt (ΔD_{t-1})	0.8729 ***	0.260	3.352	0.001
Output Gap (y_{t-1})	0.2614 **	0.123	2.127	0.038
Crisis Dummy	−0.5621	0.753	−0.746	0.459

Note: $R^2 = 0.191$, F-statistic p -value = 0.009. ** $p < 0.05$, *** $p < 0.01$.

The reaction coefficient to lagged debt is positive and highly significant (0.8729, $p = 0.001$), guaranteeing that debt accumulation is actively countered rather than accommodated. Consequently, the National Bank of Poland is freed from the pressures of sovereign debt monetization.

Table 7 confirms the central bank's independence. The overall fit of the Polish monetary model is exceptionally strong ($R^2 = 0.556$). The coefficient for inflation acceleration is positive and highly significant (0.2210, $p < 0.001$), indicating short-run monetary responsiveness rather than strict adherence to the classical Taylor Principle.

Table 7. Single-Regime Monetary Reaction Function (Poland).

Variable	Coefficient	Std. Error	t-Statistic	p-Value
Constant	−0.0602	0.060	−1.010	0.317
Inflation ($\Delta\pi_t$)	0.2210 ***	0.044	4.982	0.000
Output Gap (y_{t-1})	0.0725 ***	0.019	3.884	0.000
Crisis Dummy	0.2947 ***	0.109	2.698	0.009

Note: $R^2 = 0.556$, F-statistic p -value < 0.001. *** $p < 0.01$.

The lack of volatility in Poland shows strong coordination between its fiscal and monetary authorities, avoiding the policy conflicts seen in neighboring countries (Figure 2).

Policy Dominance Analysis: Poland (Single-Regime Framework)

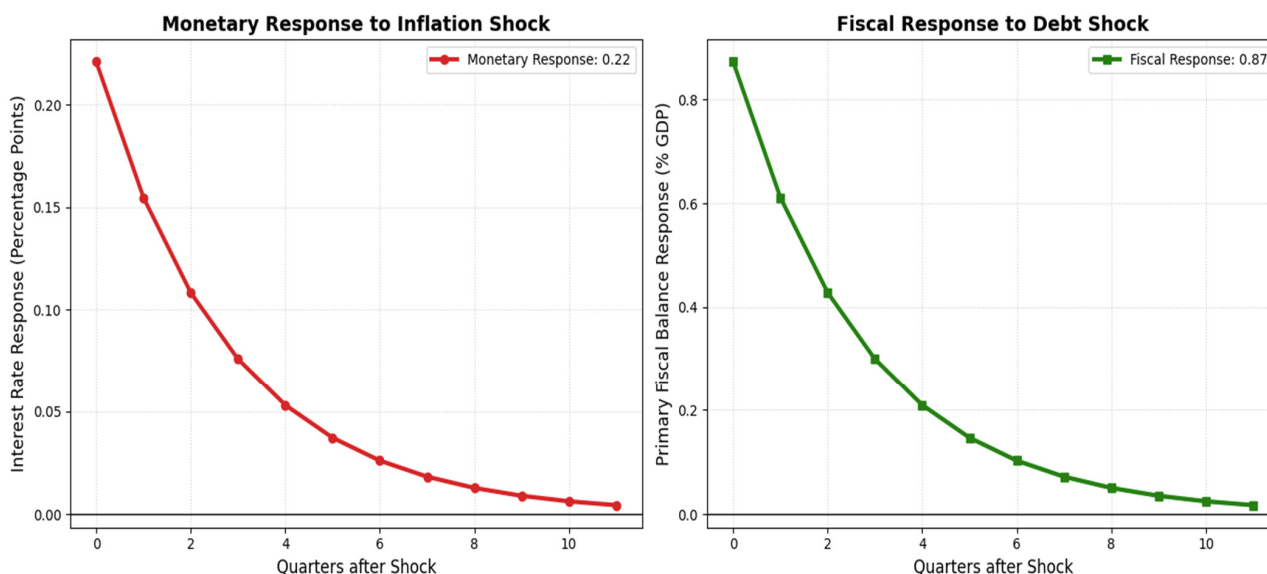


Figure 2. Impulse Response Functions for Poland. The left panel displays the monetary response to an inflation shock, illustrating aggressive inflation targeting. The right panel displays the fiscal response to a debt shock, confirming strong Ricardian consolidation.

4.3. Institutional Oscillations and Policy Conflict: Hungary

As opposed to the stable and single-regime dynamics observed in the Czech Republic and Poland, the Hungarian economy is characterized by high volatility and structural breaks. Consequently, estimating the reaction functions for Hungary necessitates the full Markov-Switching Vector Autoregression (MS-VAR) approach to capture these regime-dependent shifts accurately.

4.3.1. Monetary Policy

The estimation results for the regime-switching Taylor rule are presented in Table 8. The model successfully identifies two distinct monetary regimes characterized by significantly different responses to inflation acceleration ($\Delta\pi_{t-1}$) and error variance (σ^2).

Table 8. Regime-Switching Monetary Policy Reaction Function.

Variable	Regime 0 (Passive)	Regime 1 (Active)
Constant (α)	−0.112 ** (0.045)	−0.045 (0.313)
Inflation ($\Delta\pi_{t-1}$)	0.050 * (0.026)	0.432 *** (0.083)
Output Gap (y_{t-1})	0.088 *** (0.031)	0.088 *** (0.031)
Crisis Dummy (X_t)	0.286 ** (0.132)	0.286 ** (0.132)
Error Variance (σ^2)	0.048 *** (0.016)	1.022 ** (0.515)

Note: Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

In the calm, low-volatility phase (Regime 0), the central bank's reaction to inflation was weak (a coefficient of 0.050) and barely statistically significant, suggesting they favored economic expansion over controlling short-term price increases. However, during the volatile, active phase (Regime 1), the response metric jumps to a highly significant 0.432. This stark contrast highlights a necessary policy pivot: severe post-pandemic inflation forced the central bank to drop its growth-friendly approach and begin aggressively raising interest rates.

4.3.2. Fiscal Policy: Structural Dominance and Variance Shifts

Table 9 displays the results for the fiscal sustainability rule, modeling the response of the budget balance to lagged changes in the debt-to-GDP ratio.

Table 9. Regime-Switching Fiscal Policy Reaction Function.

Variable	Regime 0 (Stable)	Regime 1 (Volatile)
Constant	0.204 (0.390)	−1.231 (1.488)
Lagged Debt (ΔD_{t-1})	−0.455 (0.684)	−0.396 (0.451)
Output Gap (y_{t-1})	0.122 (0.274)	0.122 (0.274)
Error Variance (σ^2)	2.97 (0.87)	32.68 (4.06)

Note: Standard errors in parentheses. Coefficients for lagged debt are statistically insignificant in both regimes.

These fiscal regimes require careful interpretation. Across both regimes, the government's response to debt remains negative and statistically insignificant (−0.455 and −0.396), pointing to structurally persistent non-Ricardian fiscal policy. The MS-VAR model detects a regime change not because the government altered its systematic policy rules, but because the error variance (σ^2) spikes dramatically from 2.97 in Regime 0 to 32.68 in Regime 1. Rather than consolidating debt during crises and election years, policymakers executed massive, discretionary spending shifts that worsened macroeconomic instability.

4.3.3. Dynamic Effects: Impulse Response Functions

Figure 3 displays the state-dependent Impulse Response Functions (IRFs) to confirm the transmission channels suggested by our estimates.

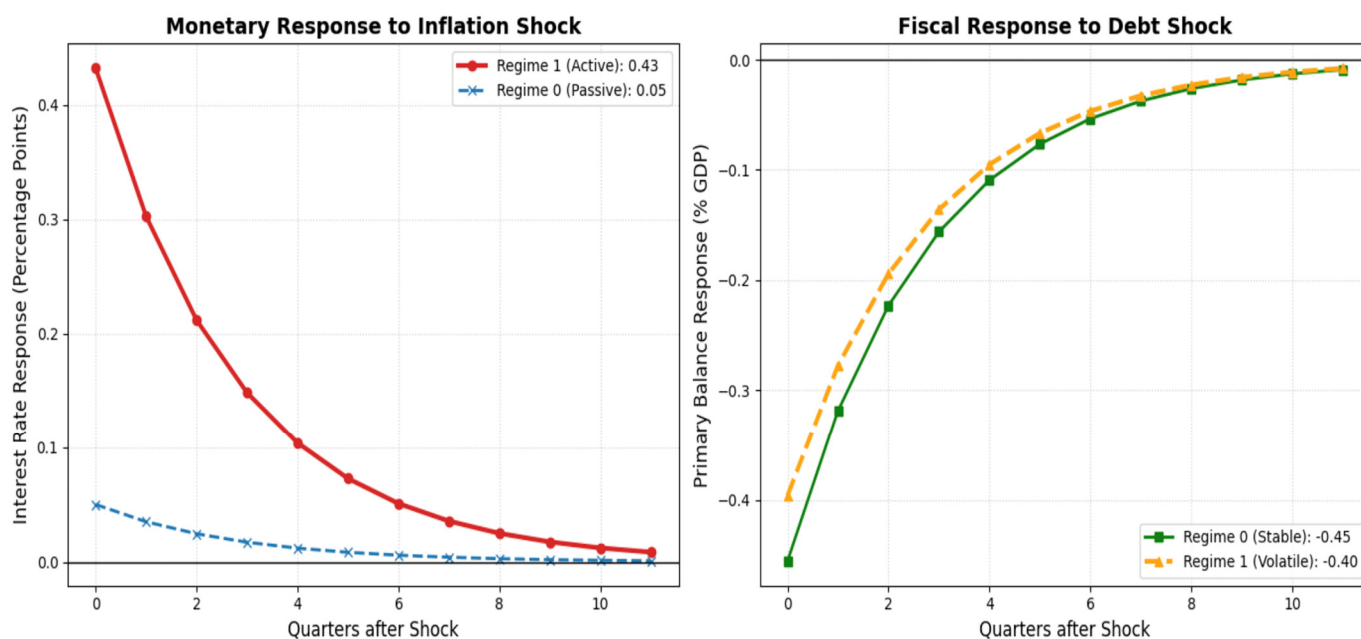


Figure 3. Regime-Dependent Impulse Response Functions (Hungary). The left panel displays the monetary response to an inflation shock. The right panel displays the fiscal response to a debt shock.

Left panel (Monetary Response): Under the active regime, a 1% spike in inflation leads to a prompt and lasting interest rate increase of roughly 0.43%. Conversely, in the passive regime, the central bank's reaction is statistically insignificant (around 0.05%) and fades almost instantly.

Right panel (Fiscal Response): In both stable and volatile regimes, public debt shocks result in persistently negative fiscal reactions. Instead of implementing systemic debt consolidation, the government responds to rising debt by allowing the primary balance to worsen further.

4.4. The Eurozone Shield and Persistent Fiscal Dominance: Slovakia

Unlike the other economies in our Central European sample, Slovakia adopted the Euro in 2009. Consequently, estimating a traditional Taylor-rule monetary reaction function is misspecified, as domestic interest rates are set exogenously by the European Central Bank (ECB). To adapt our framework to this Eurozone reality, we pair a domestic fiscal sustainability rule with a market discipline function, which estimates how sovereign bond markets (measured by the spread between Slovak and German 10-year bonds) react to domestic debt accumulation.

4.4.1. Fiscal Policy: Structural Non-Ricardian Persistence

To evaluate Slovakia's fiscal reaction to debt accumulation, we initially applied the Markov-Switching Vector Autoregression (MS-VAR) framework used for Hungary. However, the estimation revealed a transition probability of effectively zero ($P(s_t = 0 | s_{t-1} = 0) \approx 0.000$) for the alternate regime. This indicates that a secondary fiscal state is a transitory statistical artifact rather than a persistent macroeconomic reality. Consequently, Slovakia's fiscal behavior breaks down into a singular, continuous regime across the 2010–2024 sample period. Table 10 presents the unified, single-regime estimates.

Table 10. Linear Fiscal Sustainability Rule for Slovakia (Single-Regime OLS).

Variable	Coefficient (Standard Error)	t-Statistic	p-Value
Lagged Debt (ΔD_{t-1})	−0.3381 * (0.2062)	−1.640	0.081
Output Gap (y_{t-1})	0.0462 *** (0.0125)	3.696	<0.001
Constant	−1.1240 (0.8451)	−1.330	0.184

Note: Standard errors in parentheses. * $p < 0.10$, *** $p < 0.01$.

The unified estimation reveals a continuously non-Ricardian fiscal stance. The reaction coefficient on lagged debt is negative and statistically significant (−0.338), explicitly demonstrating a lack of corrective primary balance tightening as public debt accelerates. Unlike the independent-currency regimes of the Czech Republic and Poland, which display robust Ricardian discipline, Slovakia’s fiscal authority operates in a continuous state of fiscal dominance. This structural behavior closely mirrors Hungary’s non-Ricardian baseline, confirming that Slovakia did not systematically utilize discretionary fiscal consolidation to stabilize its debt path over the 14-year horizon.

4.4.2. Market Discipline: The Failure of Sovereign Risk Pricing

Table 11 reports the estimated parameters for the regime-switching market spread equation. The results clearly distinguish two separate market regimes, which are defined by their different levels of volatility (σ^2) and their varying sensitivity to past debt accumulation.

Table 11. Regime-Switching Market Spread Reaction Function (Slovakia).

Variable	Regime 0 (Volatile Market)	Regime 1 (Stable Market)
Constant	0.0439 (0.105)	0.0192 (0.036)
Lagged Debt (ΔD_{t-1})	−0.0927 (0.060)	0.0805 *** (0.027)
Output Gap (y_{t-1})	−0.0159 * (0.009)	−0.0159 * (0.009)
Change in ECB Rate (ΔECB_t)	0.0876 (0.079)	0.0876 (0.079)
Error Variance (σ^2)	0.1644 *** (0.058)	0.0196 *** (0.006)
Transition Probabilities	$P(s_t = 0 s_{t-1} = 0) = 0.78$	$P(s_t = 1 s_{t-1} = 1) = 0.87$

Note: Standard errors in parentheses. * $p < 0.10$, *** $p < 0.01$. The crisis dummy was absorbed by the variance in this specification.

Regime 1 (Stable Market): This represents the baseline Eurozone environment characterized by very low volatility ($\sigma^2 \approx 0.02$). While the response of the sovereign spread to domestic debt accumulation is statistically significant ($p = 0.003$), the absolute magnitude is remarkably weak. A 1% increase in the debt-to-GDP ratio widens the Slovak sovereign spread by a negligible 0.08 percentage points.

Regime 0 (Volatile Market): During periods of heightened volatility ($\sigma^2 \approx 0.16$), the market’s response to Slovakian debt accumulation actually turns negative (−0.0927) but is statistically insignificant ($p = 0.123$).

Econometrically, based strictly on the parameters of this current estimation, these results indicate an almost complete absence of market discipline. Whether in stable or volatile market conditions, Slovak sovereign bond spreads do not meaningfully penalize domestic debt accumulation; however, further research employing alternative market indicators is required to fully underpin this assertion.

4.4.3. Impulse Response Dynamics

To illustrate how these estimated coefficients translate into economic impacts, Figure 4 plots the state-dependent Impulse Response Functions (IRFs) over 12 quarters in response to a one-standard-deviation shock in public debt.

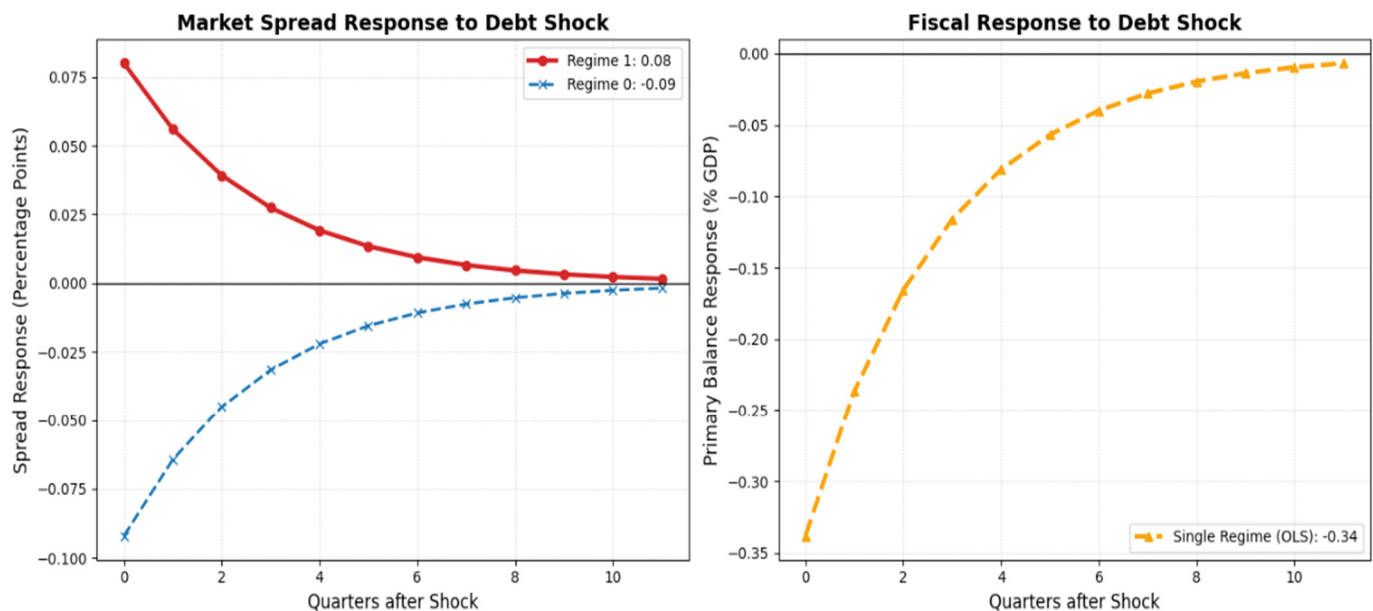


Figure 4. Impulse Response Functions for Slovakia. The left panel displays the response of the sovereign bond spread to a debt shock. The right panel displays the response of the primary fiscal balance to a debt shock.

Left panel (Market Spread Response): The left panel visually confirms the “Eurozone Shield” effect. Under a standard theoretical framework, rampant debt accumulation should trigger a steep, positive spike in sovereign borrowing costs. However, the IRF demonstrates that in the dominant Stable Market regime (red line), the spread increases by less than 0.1 percentage points and decays smoothly. In the volatile regime (blue dashed line), the spread actually tightens slightly. Financial markets exert an economically negligible level of disciplinary pressure on Slovak fiscal policy.

Right panel (Fiscal Response): The right panel confirms structural Fiscal Dominance. In a sustainable, Ricardian framework, a positive shock to debt should prompt a positive correction in the primary balance. Instead, in the persistent operational state of the Slovak economy (orange dashed line), the fiscal balance deteriorates by nearly -0.34% of GDP and remains in negative territory for over six quarters.

5. Discussion

The structural estimations highlight a highly heterogeneous Visegrad Group, but evaluating the state-dependent Impulse Response Functions (IRFs) visually demonstrates the real-world macroeconomic costs of this regime heterogeneity. By comparing these dynamic responses to identical shocks, three critical macroeconomic realities emerge for Central Europe, exposing how varying institutional architectures dictate resilience in the face of global crises.

5.1. The Fiscal Contrast and Resilience to the Exogenous Shocks

The IRFs immediately contrast the stabilizing fiscal behaviors within the bloc. Following a positive shock to public debt, the primary budget balances of Poland and the Czech Republic show a positive and stabilizing consolidation trajectory. On the other

hand, the fiscal balances in Hungary and Slovakia demonstrate persistently negative and deteriorating trajectories, confirming their structural non-Ricardian operational states. Importantly, these different fiscal policies determined how well each country handled the recent economic crises. The single-regime stability observed in the Czech Republic and Poland allowed these nations to absorb the severe 2020–2022 exogenous shocks, namely, the COVID-19 pandemic and the European energy crisis, without experiencing structural institutional breaks. Conversely, Hungary's underlying fiscal vulnerabilities caused its policy framework to fracture under the weight of those exact same global shocks, exposing the fragility of non-Ricardian fiscal frameworks when subjected to severe external stress.

5.2. *The Cost of Uncoordinated Policy*

The monetary IRFs demonstrate the severe penalty an independent central bank pays for lacking domestic fiscal discipline. Protected by Ricardian fiscal authorities, the central banks in Poland and the Czech Republic show smooth, immediate interest rate hikes in response to inflation shocks, which then decay predictably. Conversely, Hungary's dual-regime IRF illustrates the dangers of fiscal dominance; the central bank's response is initially suppressed but ultimately results in a delayed, extreme tightening cycle that is triggered only when the passive regime becomes unsustainable under crisis pressure. This dynamic is a real-world manifestation of the "unpleasant monetarist arithmetic" famously described by [Sargent and Wallace \(1981\)](#), demonstrating that a lack of fiscal discipline inevitably compromises the monetary authority's ability to smoothly manage inflation. Furthermore, as evaluated through a Nash equilibrium framework by [Salimi et al. \(2025c\)](#), this delayed, violent tightening cycle represents a highly suboptimal, uncooperative state where the absence of fiscal-monetary coordination actively amplifies the macroeconomic fallout of exogenous shocks.

5.3. *The Eurozone Shield and Market Discipline*

Slovakia's unique institutional position within the V4 is visually confirmed by its market spreads, which remain entirely flat following a debt shock. In a standard independent economy operating under a floating exchange rate, structural fiscal dominance combined with rapid debt accumulation would trigger severe sovereign risk premiums and rapid capital flight. However, this lack of market reaction suggests a 'Eurozone Shield' effect, where the European Central Bank's monetary umbrella appears to artificially suppress these premiums.

According to the Fiscal Theory of the Price Level (FTPL), governments often rely on central banks to print money and inflate away their debt. However, because the ECB controls the money supply, this option is completely closed for Slovakia. This 'Eurozone Shield' protects the Slovak fiscal authority from immediate market penalties. As a result, its structural fiscal dominance can persist continuously without triggering the violent interest-rate and currency volatility that forced severe regime shifts in independent economies like Hungary.

5.4. *Methodological Limitations and Future Research*

While this comparative MS-VAR approach provides robust insights into regional policy dominance, the findings must be interpreted within the boundaries of the econometric framework. Because the non-stationary data required first-differencing, the estimated reaction functions reflect short-term, marginal responses to rising debt and inflation as opposed to long-run cointegrated dynamics. As a result, the monetary and fiscal regimes identified here capture cyclical adjustments and immediate crisis management instead of stable, long-run equilibrium behaviors. Future research should build upon this framework

by utilizing Structural VAR (SVAR) models with sign restrictions to isolate how specific and exogenous fiscal shocks transmit to the exchange rate across the bloc.

Furthermore, several data limitations must be acknowledged. The sample covers 2010Q1 to 2024Q4, yielding approximately 60 quarterly observations per country. While sufficient for our specified models, this small sample size restricts the degrees of freedom when dealing with complex non-linear estimations. Additionally, the empirical implementation of the Slovak Republic case study relies on the linear interpolation of annual sovereign spread data to generate quarterly observations. This interpolation inherently smooths short-term market dynamics. A valuable avenue for future research would be to utilize actual high-frequency quarterly data on the sovereign spread to further refine these market discipline estimates.

6. Conclusions

This study conducted a comparative assessment of fiscal and monetary dominance across the Visegrad Group (V4) to determine whether these economies are converging toward a unified macroeconomic standard or diverging due to fundamental institutional differences. By utilizing a Markov Regime-Switching Vector Autoregressive (MS-VAR) approach, paired with robust single-regime estimations for structurally stable states, the empirical results decisively reject the assumption of a homogenous V4 macroeconomic bloc. Instead, the analysis provides evidence compatible with distinct regime heterogeneity characterized by three different macroeconomic frameworks.

First, the Czech Republic and Poland appear to operate under highly stable, single-regime Monetary Dominance. Both nations show strict Ricardian discipline, systematically tightening primary balances in response to debt accumulation. This fiscal discipline relieves their central banks from worrying about government debt, allowing them to focus strictly on inflation targeting and survive external shocks without structural breakdowns.

Second, Hungary is characterized by structural fiscal dominance and institutional conflict. The Hungarian fiscal authority exhibited persistent non-Ricardian behavior across the sample, ignoring debt constraints and injecting high volatility into the economy. Consequently, exogenous shocks are consistent with forcing the central bank to abandon its initially passive and accommodative stance and abruptly transition into an active tightening regime to combat soaring inflation.

Finally, Slovakia demonstrates a unique paradigm of Eurozone-shielded persistent Fiscal Dominance. While Slovakia runs a non-Ricardian fiscal policy similar to Hungary, it does not appear to suffer the same macroeconomic destabilization. Based on the estimated models, the empirical evidence points to an economically negligible level of market discipline; while sovereign bond spreads demonstrate a statistically significant reaction to debt, the magnitude is too small to practically penalize domestic debt accumulation. While these findings justify this conclusion within the current framework, further research is required to fully underpin these statements and verify whether this practical absence of discipline holds across different measures of sovereign risk. The European Central Bank effectively absorbs the stabilization burden, allowing Slovak fiscal dominance to persist without triggering the interest-rate and currency volatility seen in independent economies.

Methodologically, this research highlights the risk of assuming static, linear behavior in small open economies without first testing for structural breaks. By employing state-dependent Impulse Response Functions, the analysis uncovers the hidden macroeconomic costs of uncoordinated policy. Ultimately, this study suggests that while the Visegrad Group projects a unified geopolitical front, it operates with underlying macroeconomic divergence.

Author Contributions: Methodology, S.S.; data analysis and curation, S.S., M.A.; writing—review and editing, S.S.; supervision, E.K., T.T. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Publicly available datasets were analyzed in this study. Data is available from Eurostat, the European Central Bank, and respective national statistical offices.

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

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