

Article

Mitigating the Impact of Global Economic Policy Uncertainty on Social Sustainability: The Moderating Role of Governance and Natural Resource Rents in Sub-Saharan Africa

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Abstract

Global economic policy uncertainty has emerged as a significant challenge for developing regions, with Sub-Saharan Africa particularly vulnerable due to its fragile economies and social systems that rely on external support. This study examines the effect of global economic policy uncertainty on social sustainability and how this relationship is moderated by governance effectiveness and natural resource rents. These relationships were examined using 27 years of panel data from 45 Sub-Saharan African countries, spanning 1997 to 2023. The Augmented Mean Group (AMG), Common Correlated Effects Mean Group (CCMG), and the two-step difference Generalized Method of Moments (GMM) estimators are advanced methods for analyzing data and estimating relationships among variables. The study found that global economic policy uncertainty had a significant negative effect on social sustainability. Furthermore, the study revealed that governance effectiveness and natural resource rents positively and significantly moderate the relationship between global economic policy uncertainty and social sustainability. These findings have significant implications for policy and governance, highlighting the critical need for governments, especially in developing and resource-dependent regions, to strengthen institutional capacity and fiscal frameworks in order to manage the adverse effects of global economic policy uncertainty. They underscore the importance of developing responsive, transparent, and accountable governance structures that can effectively allocate resources toward social priorities even during periods of external economic volatility.

Keywords: global economic policy uncertainty; governance effectiveness; natural resource rent; Sub-Saharan African countries; sustainable development theory



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1. Introduction

Social sustainability, a concept crucial to a country's long-term development, stability, and resilience, refers to a society's ability to maintain and enhance its social fabric, quality of life, and economic prosperity over time [1,2]. It encompasses social inclusion, equity, access to essential services, and the overall well-being of both present and future generations. Nations that prioritize social sustainability are better positioned to reduce poverty, foster social cohesion, and withstand economic or environmental shocks [3]. In contrast, countries that neglect social dimensions often face growing inequality, weakened institutions, and social unrest. As global development agendas increasingly emphasize sustainability and

inclusion, advancing social sustainability has become a central focus of national policy and a foundational pillar for achieving long-term development outcomes [4].

Global economic policy uncertainty is a critical concern for countries in today's interconnected and volatile economy [5]. Uncertainty about trade policies, fiscal decisions, monetary frameworks, and geopolitics disrupts investment flows, complicates economic planning, and erodes public confidence [6]. Both developed and developing countries are vulnerable. This uncertainty risks employment, income stability, and social protection. Policy uncertainty often delays business and government actions, reduces capital inflows, and worsens inequality, disproportionately affecting marginalized populations [7]. As economies become more sensitive to policy signals, understanding and addressing this uncertainty is essential for building resilience and protecting long-term goals.

Global economic policy uncertainty poses a serious threat to social sustainability by undermining the economic stability and public investment needed to support inclusive development [8]. Unclear or rapidly shifting policies—whether related to trade, taxation, interest rates, or regulation—often delay essential investments in social services such as education, healthcare, and infrastructure. These disruptions can result in job losses, reduced access to basic services, and heightened inequality [9]. The most vulnerable groups typically suffer the most, as government budgets come under stress and social safety nets weaken. Over time, persistent uncertainty erodes institutional trust and undermines efforts to create cohesive and equitable societies, ultimately threatening the foundations of social sustainability [10].

Many countries are already grappling with the consequences of rising global economic policy uncertainty, including social instability, widening inequality, and eroding public welfare systems [11,12]. Volatile trade environments, fluctuating interest rates, inconsistent fiscal commitments, and unpredictable geopolitical decisions have created increasingly difficult economic conditions to navigate. These factors disrupt long-term planning, reduce job security, and constrain governments' ability to maintain adequate levels of public spending—particularly in developing countries, where institutional capacity is often limited [13].

The vulnerability is especially pronounced in Sub-Saharan Africa (SSA), where many economies remain highly dependent on commodity exports, external borrowing, foreign aid, and imported goods. As a result, global economic policy uncertainty is rapidly transmitted into domestic economies through declining export revenues, exchange rate instability, inflationary pressures, and reduced fiscal space for social investment. Weak institutional systems, limited economic diversification, and fragile social protection structures further intensify these effects across the region. In many Sub-Saharan African countries, governments struggle to sustain healthcare, education, and welfare spending amid external shocks, leaving vulnerable populations disproportionately exposed to poverty, unemployment, and declining living standards. As uncertainty intensifies, these structural vulnerabilities significantly hinder social sustainability and long-term development progress across the region.

Several studies have examined how global economic policy uncertainty impacts economic and environmental outcomes, highlighting effects on investment, growth, and emissions [14,15]. However, the specific relationship between global economic policy uncertainty and social sustainability remains unclear, especially regarding equity, access to essential services, and overall societal well-being. Furthermore, the moderating roles of government effectiveness—reflecting the quality of policy implementation and service delivery [16] and natural resource rents, which shape a country's fiscal capacity [17], have not been thoroughly investigated in this context. Both factors are crucial for determining

how policy uncertainty translates into social outcomes, yet their moderating effects remain largely absent from current research.

This study assesses how global economic policy uncertainty affects social sustainability and examines how government effectiveness and natural resource rent moderate this relationship. The analysis draws on 27 years of panel data from 45 Sub-Saharan African countries (1997–2023). To estimate relationships among variables, the study applies three advanced panel estimation methods: the Augmented Mean Group (AMG) estimator, the Common Correlated Effects Mean Group (CCMG) estimator, and the two-step difference Generalized Method of Moments (GMM) estimator. The research addresses the following questions: How does global economic policy uncertainty affect social sustainability? How do government effectiveness and natural resource rents moderate this effect? Findings aim to determine whether strong institutions and resource wealth reduce the negative social effects of policy uncertainty and enable more inclusive, resilient development.

This study contributes to the literature by assessing the effect of global economic policy uncertainty on social sustainability, a key factor in shaping inclusive, resilient development strategies. Despite growing volatility, the social consequences remain poorly understood. These provide insights that help policymakers safeguard equity, service delivery, and well-being amid policy unpredictability.

The second contribution of this study examines how governance effectiveness moderates the relationship between global economic policy uncertainty and social sustainability. Government effectiveness plays a critical role in shaping how countries respond to global economic policy uncertainty. Effective governance can cushion the adverse effects of uncertainty by ensuring stable service delivery, efficient policy implementation, and public trust. This contribution highlights the importance of institutional strength in protecting social outcomes during periods of global volatility.

Finally, this study explored how natural resource rents moderate the relationship between global economic policy uncertainty and social sustainability. Natural resource rents can influence how countries absorb the social impacts of global economic policy uncertainty. When managed responsibly, resource revenues provide fiscal space to sustain public services and social programs during economic shocks. This contribution underscores the importance of leveraging resource wealth to stabilize social development amid rising global policy unpredictability.

Amid rising global economic policy uncertainty, developing countries with fragile institutional structures face increasing pressure on their social systems, including heightened risks to welfare provision, inequality, and public service delivery. This study is motivated by the need to understand how institutional and economic factors can safeguard social well-being under such volatile conditions. By examining key determinants that enhance resilience, the study provides evidence on how countries can better withstand external shocks and maintain social stability. The findings aim to offer meaningful insights for policymakers to strengthen institutional capacity and design strategies that promote social sustainability in an increasingly unpredictable global environment.

2. Literature Review

2.1. Theoretical Background

The theory of sustainable development provides the most appropriate and robust framework for this study. Grounded in the Brundtland Commission's definition, the theory emphasizes that actual development must meet the needs of the present without compromising the ability of future generations to meet theirs [18]. It highlights the interconnectedness of economic growth, environmental protection, and social equity, asserting that sustainable development cannot be achieved by focusing on any one of these

pillars in isolation. Instead, integrated policymaking is essential, where economic and environmental decisions are aligned with social outcomes to promote resilience, well-being, and inclusion [19].

This theoretical foundation is particularly relevant for understanding how global economic policy uncertainty affects social sustainability. According to the theory, economic shocks or instability—such as that caused by unpredictable global policy environments—can undermine social development if not properly managed [20]. Uncertainty can erode access to essential services, increase poverty, and weaken social cohesion. The theory suggests that for countries to achieve sustainable development, their economic environments must be stable and predictable enough to support continuous social investment [21]. Thus, the theory directly supports investigating how economic uncertainty undermines long-term social outcomes and why safeguarding these outcomes is essential for sustainable progress.

Government effectiveness, as explored in this study, aligns squarely with sustainable development theory's emphasis on strong institutions as enablers of balanced development [22]. Effective governments are capable of absorbing external shocks, ensuring consistent policy delivery, and protecting vulnerable populations during periods of economic volatility. From the perspective of sustainable development theory, governance is not merely a structural factor but a critical mechanism that prevents economic disruptions from translating into social harm. Effective governance protects social spending by strengthening fiscal discipline, improving tax collection efficiency, reducing corruption, and limiting capital flight during crises [23]. In addition, strong institutional quality enhances public resource allocation and ensures that government revenues are directed toward essential social services such as healthcare, education, and welfare support [24]. These governance mechanisms help maintain social equity and economic stability even under adverse economic conditions. In this context, government effectiveness serves as a buffer protecting the social pillar of sustainability amid unpredictable economic conditions, reinforcing the theory's emphasis on institutional strength [25].

Natural resource rents also align with the sustainable development theory, particularly in how they are managed and distributed [26]. The theory warns against resource-driven growth that benefits a few while harming the many, calling instead for resource use that supports intergenerational equity and inclusive development. In this study, the role of resource rents is interpreted through this lens—as a potential tool for stabilizing public investment in social services during periods of global economic uncertainty [27]. When resource revenues are effectively allocated, they can shield essential services and promote social equity, even in the face of economic shocks.

Beyond this, institutional theory offers an additional explanatory lens by emphasizing that formal rules, regulatory systems, and governance structures shape countries' responses to external shocks [28]. In contexts where institutions are strong, transparent, and rule-based, governments are better able to enforce fiscal discipline, maintain policy continuity, and ensure that resource revenues are not diverted away from social priorities. Conversely, weak institutions increase the likelihood that economic uncertainty translates into policy inconsistency and reduced social protection [29].

Resource dependence theory further strengthens the explanation by highlighting that governments rely on external financial and resource inflows to sustain public services [30]. During periods of high global economic uncertainty, this dependence becomes more critical, as fluctuations in trade, aid, and commodity revenues directly affect fiscal capacity. Countries with diversified and well-managed resource bases are therefore better positioned to maintain social spending, while highly dependent economies face greater vulnerability to instability in global markets [31].

2.2. Hypothesis Development

The conceptual model of this study is presented in Figure 1, which shows the interconnected relationships among the variables, the hypothesized number for each relationship, and a legend indicating the type of relationship examined (direct, control, or moderating).

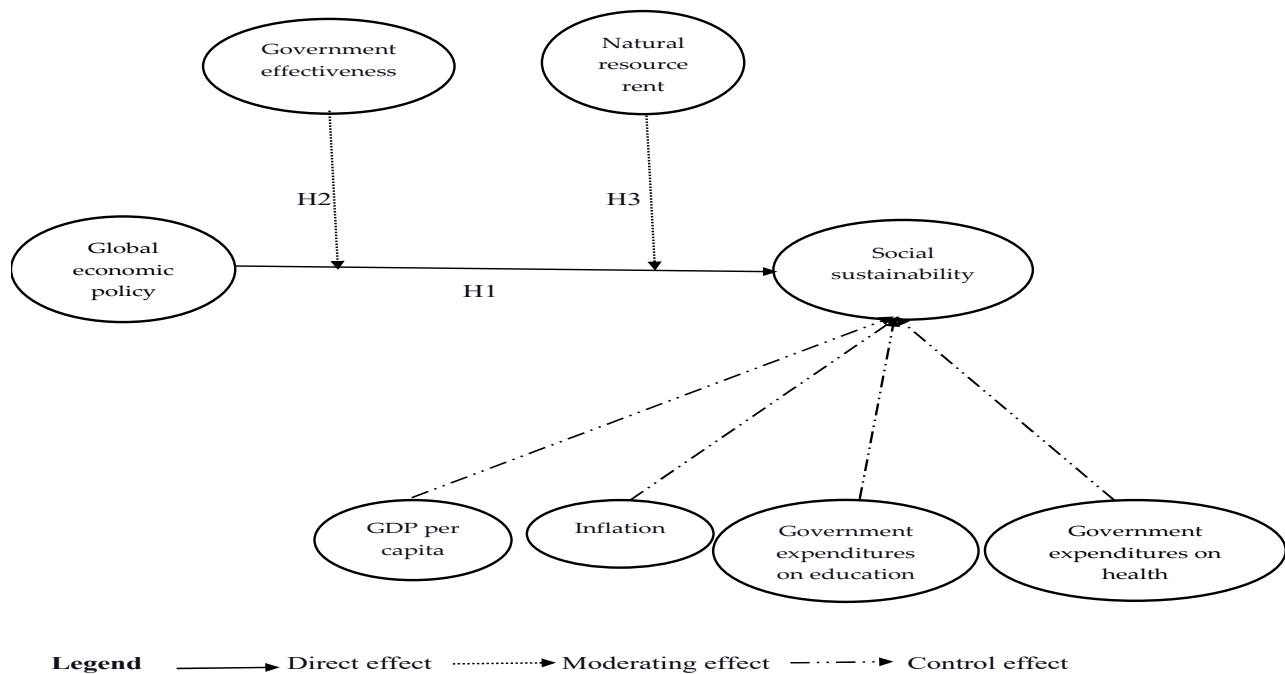


Figure 1. Conceptual framework.

2.2.1. The Influence of Global Economic Policy Uncertainty on Social Sustainability

Global economic policy uncertainty undermines social sustainability by disrupting the macroeconomic environment that underpins public investment and social service provision [32]. When economic policies are unpredictable, such as unclear fiscal priorities, volatile interest rates, or erratic trade regulations, governments often struggle to maintain consistent public spending on health, education, and social infrastructure. This can weaken access to basic services, particularly for marginalized groups. Empirical evidence by Nguyen and Schinckus [33] reported that spikes in global policy uncertainty reduce public expenditure in low- and middle-income countries, with adverse effects on social outcomes. From the perspective of sustainable development theory, economic volatility undermines the foundation of inclusive development by destabilizing the very institutions and fiscal frameworks that ensure long-term human well-being [34].

Additionally, global economic policy uncertainty creates hesitation in the private sector, discouraging investment in socially beneficial sectors such as affordable housing, educational technologies, and healthcare innovation [9]. Firms tend to delay capital commitments in uncertain environments, reducing job creation and weakening labor market conditions. This dynamic contributes to unemployment and underemployment, which are key threats to social sustainability. For example, studies by [35,36] found that economic policy uncertainty significantly suppresses corporate investment activities. According to the sustainable development theory, the failure to promote inclusive economic opportunities, especially for vulnerable populations, diminishes a society's resilience and capacity to advance intergenerational equity, a core principle of sustainability [21].

Furthermore, uncertainty erodes public trust in institutions, which is essential for building social cohesion. When governments respond inconsistently to global economic shifts or when policy direction appears reactive rather than strategic, citizens lose con-

fidence in governance, leading to weakened social contracts and reduced civic engagement [37]. In countries already facing institutional fragility, this mistrust may fuel social unrest, inequality, and exclusion. Empirical work by [9,38] confirms that economic policy uncertainty is linked with rising social tension and policy volatility. The theory of sustainable development emphasizes the importance of robust governance as a vehicle for equitable progress [39]. When institutional trust erodes, the state's ability to promote social inclusion and long-term development is compromised.

Lastly, global economic policy uncertainty can exacerbate inequality by limiting governments' ability to protect the most vulnerable during times of economic turbulence [40]. When external shocks reduce revenues or increase debt burdens, social protection programs are often the first to be cut, widening disparities. For instance, [41] found that uncertainty increases income inequality in emerging markets, mainly through reduced government spending and increased market volatility. In this context, the sustainable development theory calls for resilience through integrated policies that safeguard the social dimension during economic downturns. Countries that fail to protect social investments during periods of uncertainty risk long-term setbacks in poverty reduction, education, healthcare, and inclusion—key components of social sustainability [42]. Based on these discussions, this research proposes that:

H1. *Global economic policy uncertainty negatively and significantly affects social sustainability.*

2.2.2. The Moderating Effect of Governance Effectiveness in the Relationship Between Global Economic Policy Uncertainty and Social Sustainability

Governance effectiveness plays a critical moderating role in the relationship between global economic policy uncertainty and social sustainability by enhancing the state's capacity to respond to external shocks. In environments of high policy uncertainty, countries with strong and efficient governance structures are better equipped to maintain service delivery, implement responsive policies, and uphold institutional trust [43]. According to [44], governance effectiveness reflects the quality of public services, the competence of civil servants, and the credibility of government commitments. These factors become especially vital when navigating uncertainty, as they help sustain public investment in education, healthcare, and welfare systems. Within the framework of the sustainable development theory, effective governance ensures that economic turbulence does not derail progress toward inclusive and equitable development [45].

Moreover, effective governance can shield vulnerable populations from the adverse social effects of global economic policy uncertainty by deploying targeted interventions and stabilizing fiscal strategies [46]. In countries where governance is strong, governments are better able to manage uncertainty without compromising the integrity of social programs. Studies by [45,47] suggested that countries with higher governance quality experience less volatility in public spending and exhibit stronger social outcomes during economic shocks. This aligns with the sustainable development theory's assertion that institutional quality is central to balancing economic resilience with social equity, ensuring that temporary disruptions do not lead to long-term social regression [48].

In contrast, in countries with weak governance, global economic uncertainty often leads to erratic policy responses, reduced social investment, and increased inequality [49]. Poor governance exacerbates the negative social consequences of uncertainty by limiting institutional capacity to deliver essential services, undermining accountability, and reducing transparency in public decision-making. As uncertainty intensifies, such countries may face rising social unrest, diminished access to basic services, and weakened public trust—all of which jeopardize social sustainability [1]. Therefore, governance effectiveness serves as a stabilizing mechanism that mitigates the negative impact of policy uncertainty, reinforcing

the need for strong institutions to uphold the social pillar of sustainable development. Based on these discussions, this study proposes that:

H2. *Governance effectiveness positively and significantly moderates the relationship between global economic policy uncertainty and social sustainability.*

2.2.3. The Moderating Effect of Natural Resource Rent in the Relationship Between Global Economic Policy Uncertainty and Social Sustainability

Natural resource rents moderate the relationship between global economic policy uncertainty and social sustainability by providing governments with a fiscal cushion to sustain social programs during periods of external volatility. In resource-rich countries, revenues generated from natural assets such as oil, gas, and minerals can be mobilized to protect public services like healthcare, education, and welfare from budget cuts when economic uncertainty reduces other revenue streams [50]. According to sustainable development theory, using economic resources to support long-term human well-being and social equity is essential to sustainable development. When well-managed, natural resource rent enables governments to buffer the adverse social impacts of global policy unpredictability and maintain the continuity of critical social investments [51].

However, the moderating effect of resource rents depends heavily on the quality of resource governance and fiscal policy [52]. In countries with strong institutions and prudent fiscal management, resource rents can stabilize national budgets and reduce the vulnerability of social programs to economic shocks. Empirical evidence from Cyrek [53] shows that resource windfalls, when effectively governed, are positively associated with increased social spending and poverty reduction. In such contexts, natural resource revenues play a vital role in sustaining inclusive development during periods of uncertainty [54], reinforcing the sustainable development theory's emphasis on equitable resource distribution as a pillar of sustainability.

In contrast, when resource rents are poorly managed, they may fail to protect social sustainability and may even worsen the effects of global economic uncertainty [27]. In cases where rents are misallocated, siphoned through corruption, or used to fund short-term political objectives, they contribute to fiscal volatility rather than stability. This misuse can intensify social inequality and undermine access to essential services, particularly when uncertainty constrains other revenue sources. Studies by [55,56] warn of the resource curse, in which countries with abundant natural resources experience weaker social outcomes due to poor governance. Therefore, while natural resource rents have the potential to moderate the relationship between global economic policy uncertainty and social sustainability, this effect is contingent on transparent, accountable, and inclusive resource management aligned with long-term development goals [57].

H3. *Natural resource rent positively and significantly moderates the relationship between global economic policy uncertainty and social sustainability.*

3. Methodology

3.1. Sample and Data

This study focused on Sub-Saharan African countries due to the region's heightened exposure to global economic policy uncertainty and its profound implications for social sustainability. Many of these countries face institutional fragility, fiscal vulnerability, and overreliance on commodity exports, which make them particularly sensitive to external shocks [58]. Ongoing policy reforms under the African Union's Agenda 2063, national development plans aimed at poverty reduction, and increasing international financial integration highlight the relevance of examining how uncertainty affects social

outcomes [59]. These dynamics provide a compelling basis for selecting Sub-Saharan Africa, offering a context where institutional effectiveness and resource management are critical to sustainable development.

This study used 27 years of panel data from 45 Sub-Saharan African countries, spanning 1997 to 2023. The selection of countries and time period was guided by clear inclusion and exclusion criteria to ensure data consistency and analytical reliability. Countries were included if they had continuous and sufficient data for all key variables, including global economic policy uncertainty, governance indicators, natural resource rents, and social sustainability measures, for most of the study period. In addition, only countries classified as Sub-Saharan African by the World Bank were considered. Countries were excluded if they had substantial missing data across key variables, inconsistent reporting across the study period, or were not part of the World Bank's Sub-Saharan Africa classification. The data were obtained from the World Bank's World Development Indicators (WDI), the United Nations Development Programme (UNDP), the Worldwide Governance Indicators (WGI), and the global economic policy uncertainty index compiled by the Economic Policy Uncertainty (EPU) Project.

The selected timeframe captures several key regional and global developments—including the implementation of structural adjustment programs, debt relief under the Heavily Indebted Poor Countries (HIPC) Initiative and the Multilateral Debt Relief Initiative (MDRI), global financial crises, the COVID-19 pandemic, and Africa's growing integration into global trade and investment flows. These events significantly shaped economic governance and social development trends in the region. The comprehensiveness and reliability of these data sources, coupled with major policy shifts and socioeconomic transitions during this period, provide a robust foundation for analyzing long-term patterns. These considerations formed the basis for selecting the 1997–2023 period.

3.2. Dependent, Independent and Control Variables

Table 1 presents the dependent, independent, and control variables, including their abbreviations, measures, and data sources.

Table 1. Summary of dependent, independent, and control variables.

Variables	Abbreviation	Measurement	Sources
Dependent variable: Social sustainability	SOSUT	Human Development Index (HDI)	[60]
Independent variable: Global Economic Policy uncertainty	GBEPU	Economic Policy Uncertainty Index (constructed from news coverage, tax codes, and forecast disagreements)	[61]
Control variables Gross domestic product (GDP) per capita	GRPPP	Constant US dollars	[62]
Inflation	INFLAT	Consumer price index (%).	[62]
Government expenditures on education	GEOEDU	Government expenditure on education, total (% of government expenditure)	[62]
Government expenditures on health	GOVEXHE	Domestic general government health expenditure (% of current health expenditure)	[62]
Moderating variables Government effectiveness	GOVEFF	Score ranging from −2.5 (weak) to +2.5 (strong)	[63]
Natural resource rent	NARREN	Total natural resource rents (% of GDP)	[62]

3.2.1. Dependent Variable

Social sustainability refers to a society's ability to create an inclusive and equitable environment where individuals have fair access to opportunities, essential services, and resources needed to improve their quality of life and long-term well-being [64,65]. Social sustainability was measured using the Human Development Index (HDI), a widely recognized indicator that combines health, education, and income dimensions. The HDI was considered suitable for the Sub-Saharan African context because the region's development challenges are complex and interconnected, including poverty, inequality, limited access to healthcare, and educational gaps. Compared with single indicators, the HDI offers a more comprehensive picture of social progress and quality of life [66]. In addition, the index is widely used in sustainability and development research because it allows consistent comparison across countries and over time. Although measures such as poverty rates or the Gini coefficient could also be used, they reflect only specific aspects of social sustainability rather than overall human development outcomes [67].

3.2.2. Independent Variable

Global economic policy uncertainty refers to the level of unpredictability and instability surrounding international economic policies, including changes in trade, fiscal, and monetary decisions that can influence economic activities, investment flows, and overall economic stability across countries [9]. This uncertainty was measured using the Global Economic Policy Uncertainty Index developed by the Economic Policy Uncertainty Project. It is a suitable measure as it reflects global fluctuations that influence national economic planning, investment decisions, and social spending [68]. High levels of policy uncertainty can delay investments, reduce employment opportunities, and strain public services, thereby undermining social sustainability [8]. Its broad scope and empirical relevance make it an appropriate and robust independent variable for this study.

3.2.3. Control Variables

This study used gross domestic product (GDP) per capita, inflation rate, and government expenditures on education and health as control variables to assess their impact on social sustainability.

GDP per capita is a standard measure of a country's economic output per person [69]. It reflects the overall income level and potential resources available for public service delivery. Higher GDP per capita is often associated with better access to education, healthcare, and infrastructure, key aspects of social sustainability [70]. It is a critical control variable as it shapes a country's capacity to respond to economic shocks and policy uncertainty.

The inflation rate measures the average change in prices over time in an economy [71]. It directly affects household purchasing power, access to basic needs, and the cost of public services. High inflation can erode real incomes and increase poverty, threatening social sustainability [72]. As a macroeconomic control variable, inflation reflects economic stability and policy credibility, both of which are essential in analyzing the broader impacts of economic policy uncertainty on social well-being.

Government expenditures on education reflect the allocation of public resources to expand access to education, improve educational infrastructure, and promote skill development [73]. It serves as a vital input to building human capital and reducing inequality, both central pillars of social sustainability. Higher education spending often leads to improved societal outcomes, such as social mobility and inclusion [74], making it a valuable control variable for evaluating policy impacts on long-term development and equity.

Government health expenditures reflect the public sector's financial commitment to healthcare services and infrastructure [75]. It plays a critical role in ensuring access to essential health services, improving life expectancy, and reducing vulnerability to diseases. As a component of human development, health spending strongly correlates with social sustainability outcomes. It is therefore a control variable that reflects a nation's prioritization of social welfare and resilience in the face of policy uncertainty [76].

3.2.4. Moderating Variables

Government effectiveness reflects the quality of public services, the competence of civil servants, the independence of institutions, and the credibility of policy implementation [77]. As a moderating factor, it shapes the extent to which global economic policy uncertainty translates into social sustainability outcomes. In environments with strong governance, institutions are better able to absorb external shocks, maintain policy continuity, and protect essential social services such as healthcare, education, and welfare even during periods of heightened uncertainty. Effective governance also strengthens institutional trust and ensures equitable allocation of public resources [78], thereby cushioning the adverse social impacts of economic instability.

Natural resource rent refers to revenues generated from the extraction of natural resources such as oil, gas, and minerals, net of production costs [79]. As a moderating variable, it influences the extent to which global economic policy uncertainty affects social sustainability by shaping fiscal space and public investment capacity. When resource rents are managed efficiently and transparently, they provide governments with additional financial buffers that help sustain social spending during periods of global volatility. This reduces the vulnerability of social systems to external shocks and supports inclusive development outcomes [80]. However, where governance structures are weak, resource dependence may intensify inequality, corruption, and fiscal mismanagement, thereby weakening the protective role of resource rents in stabilizing social sustainability under uncertain global economic conditions.

3.3. Pre-Estimation Tests

To ensure reliability and unbiased empirical outcomes, this study adopted robust estimation methods, beginning with a thorough model selection procedure. The initial step involved examining the presence of cross-sectional dependence among the 45 Sub-Saharan African countries. Cross-sectional dependence arises when disturbances across countries are correlated, often due to shared external shocks or omitted common factors [81]. Neglecting this issue may result in incorrect standard errors and misleading conclusions. To evaluate this, the study used the Pesaran (CD), Friedman, and Frees tests. These tests assume cross-sectional independence under the null hypothesis and dependence under the alternative. The results, presented in Table 2, reject the null hypothesis, confirming the presence of cross-sectional dependence in the panel dataset.

Given the presence of cross-sectional dependence, the subsequent step was to evaluate whether slope coefficients were homogeneous or heterogeneous across countries. Assuming homogenous slope estimates in such a context can result in inaccurate and biased estimations [82]. To address this, the Pesaran–Yamagata slope heterogeneity test was conducted. The null hypothesis of this test posits that the slope coefficients are homogeneous, whereas the alternative hypothesis posits heterogeneity. Results shown in Table 2 reject the null hypothesis, providing statistical confirmation of slope heterogeneity in the panel data.

To address potential endogeneity arising from reverse causality or omitted variable bias when examining the effects of global economic policy uncertainty, government effectiveness, and natural resource rents on social sustainability, the Durbin–Wu–Hausman

(DWH) test was conducted [83]. The null hypothesis assumes that all regressors are exogenous and not correlated with the error term. However, the results presented in Table 2 led to the rejection of the null hypothesis, confirming the presence of endogeneity in the model. This indicates that conventional estimation techniques may produce biased and inconsistent results. Consequently, appropriate econometric strategies are required to ensure reliable inference regarding the relationship between economic uncertainty, moderating institutional factors, and social sustainability outcomes.

Table 2. Cross-sectional and heterogeneity tests.

Types Tests	Social Sustainability
Cross-sectional tests	
Pesaran's test	67.372 ***
Friedman's test	473.422 ***
Frees' test	12.743 ***
Heterogeneity test (Peseran–Yamagata test)	
Δ -tilde stat.	39.323 ***
Δ adj-tilde stat.	45.398 ***
Endogeneity tests	
Durbin–Wu–Hausman (DWH) Test	12.842 ***

*** $p < 0.01$.

The next step in the pre-estimation procedure was to test for stationarity in the panel dataset, assessing whether the statistical properties of the variables remained stable over time. In light of the cross-sectional dependence, the study employed the Cross-sectionally Augmented Dickey–Fuller (CADF) and Cross-sectionally Augmented IPS (CIPS) unit root tests. These tests, extensions of the conventional ADF and IPS, are designed to account for cross-sectional correlation, thus enhancing the reliability of the stationarity results [84].

The null hypothesis for both CADF and CIPS assumes that the variables are non-stationary, while the alternative suggests stationarity. These tests were performed at both the level and first-difference levels. The statistical results presented in Table 3 rejected the null hypothesis, indicating that the variables were stationary either in levels or in first differences. This outcome suggests the absence of unit root issues, thereby reducing the risk of spurious regressions and affirming the dataset's suitability for long-run analysis.

Table 3. Cross-sectional panel unit root tests.

Variable	Cross-Sectional Augmented Dickey–Fuller (CADF)		Cross-Sectional Augmented IPS (CIPS)	
	Levels	1st Difference	Levels	1st Difference
Social sustainability	−17.216 ***	−41.705 ***	−16.273 ***	−39.262 ***
Global Economic Policy uncertainty	−6.842 ***	−58.614 ***	−12.506 ***	−47.931 ***
Government effectiveness	−22.905 ***	−63.287 ***	−18.114 ***	−44.562 ***
Natural resource rent	−9.479 ***	−37.918 ***	−5.832 ***	−28.277 ***
Gross domestic product (GDP) per capita	−15.627 ***	−66.195 ***	−31.291 ***	−52.668 ***
Inflation	−4.953 ***	−36.482 ***	−7.209 ***	−25.774 ***
Government expenditures on education	−27.421 ***	−44.302 ***	−13.856 ***	−62.733 ***
Government expenditures on health	−11.738 ***	−49.617 ***	−4.984 ***	−33.995 ***

*** $p < 0.01$.

To assess long-run relationships among the variables, the Westerlund cointegration test was subsequently applied. This method is particularly appropriate in the presence of cross-sectional dependence, as it uses bootstrapped error-correction models [85]. The test's null hypothesis posits no cointegration, while the alternative indicates the presence of a

long-run equilibrium. As shown in Table 4, the rejection of the null hypothesis confirms the existence of a stable long-term association among the variables, justifying the use of long-run estimators in the analysis.

Table 4. Westerlund test for Cointegration.

Test	Social Sustainability
Cointegration tests	
Westerlund test	−23.004 ***

*** $p < 0.01$.

3.4. Regression Estimations

Given the statistical evidence of cross-sectional dependence, slope heterogeneity, stationarity, and a long-run equilibrium relationship among the variables, the Augmented Mean Group (AMG) estimator was identified as the most appropriate estimation technique. The AMG model effectively captures both global shocks and country-specific influences, making it particularly well-suited to heterogeneous panel data [86]. Its ability to account for structural variations across countries enhances the reliability of long-term parameter estimates. Comparative model evaluations further demonstrated that AMG outperformed conventional methods such as Fixed Effects (FE), Random Effects (RE), and Pooled OLS (POLS), with the latter being unsuitable because it fails to address cross-sectional dependence and parameter heterogeneity [87].

To ensure the robustness of the AMG estimation results, the study employed the Common Correlated Effects Mean Group (CCMG) estimator as a validation tool. CCMG accounts for unobserved common factors and cross-sectional dependence by including cross-sectional averages of the regressors, providing consistent estimates in the presence of global shocks and interdependencies [88,89]. While it also assumes heterogeneity across units, CCMG enhances the robustness and reliability of panel estimations by mitigating omitted variable bias [90]. Using CCMG as a robustness check confirmed the stability of the AMG results and strengthened the credibility and generalizability of the study's empirical conclusions.

The study employs the two-step Difference Generalized Method of Moments (GMM) estimator to address potential endogeneity arising from reverse causality and omitted-variable bias in the relationship among global economic policy uncertainty, government effectiveness, natural resource rents, and social sustainability [91]. This method uses lagged values of the explanatory variables as internal instruments to produce consistent and unbiased estimates. It further eliminates unobserved country-specific effects by first differencing, making it suitable for dynamic panel data. Compared to the one-step approach, the two-step GMM provides more efficient estimates and robust standard errors, ensuring reliable inference in analyzing institutional and resource-driven determinants of social sustainability [89].

3.5. Model Specification

To examine the effect of global economic policy uncertainty on social sustainability, as well as the moderating effects of governance effectiveness and natural resource rents, this study employed three regression models. Model 1 explores the direct relationship between the dependent, independent, and control variables. In model 2, the moderating effect of governance effectiveness was included, and in model 3, the moderating effect of natural resource rent was included. These models, directly applicable to the study's objectives, are presented below.

Model 1:

$$SOSUT = B0_{T\ SSA} + \beta_1 GBEP_{T\ SSA} + \beta_2 GOVEFF_{T\ SSA} + \beta_3 NARREN_{T\ SSA} + \beta_4 GRPPP_{T\ SSA} + \beta_5 INFLAT_{T\ SSA} + \beta_6 GEOEDU_{T\ SSA} + \beta_7 GOVEXHE_{T\ SSA} + u$$

Model 2:

$$SOSUT = B0_{T\ SSA} + \beta_1 GBEP_{T\ SSA} + \beta_2 GOVEFF_{T\ SSA} + \beta_3 NARREN_{T\ SSA} + \beta_4 GRPPP_{T\ SSA} + \beta_5 INFLAT_{T\ SSA} + \beta_6 GEOEDU_{T\ SSA} + \beta_7 GOVEXHE_{T\ SSA} + \beta_8 GBEP \times GOVEFF_{T\ SSA} + u$$

Model 3:

$$SOSUT = B0_{T\ SSA} + \beta_1 GBEP_{T\ SSA} + \beta_2 GOVEFF_{T\ SSA} + \beta_3 NARREN_{T\ SSA} + \beta_4 GRPPP_{T\ SSA} + \beta_5 INFLAT_{T\ SSA} + \beta_6 GEOEDU_{T\ SSA} + \beta_7 GOVEXHE_{T\ SSA} + \beta_8 GBEP \times NARREN_{T\ SSA} + u$$

NB: The abbreviations utilized in the regression model have been defined in Table 1. “SSA” denotes Sub-Saharan African, “T” denotes the years of panel data selected for the study, and “u” denotes the error term.

4. Data Analysis, Interpretation and Results

Table 5 presents the descriptive analysis results for the variables. The average for social sustainability indicates that social equity and welfare are experiencing moderate advancement throughout Sub-Saharan Africa. This indicates that policy must prioritize inclusivity and robustness to enhance long-term social development results. The average global economic policy uncertainty indicates moderate external volatility impacting regional economies. Countries in Sub-Saharan Africa are more vulnerable to global shocks; therefore, they must employ diversification strategies to maintain economic stability and growth.

Table 5. Descriptive statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max	VIF	1/VIF
Social sustainability	1215	0.492	0.142	0.211	0.812	2.15	0.465
Global Economic Policy uncertainty	1215	4.707	0.214	4.222	5.187	1.94	0.515
Government effectiveness	1215	−0.612	0.453	−1.743	0.842	2.74	0.365
Natural resource rent	1215	12.483	8.215	1.027	43.562	3.21	0.312
Gross domestic product (GDP) per capita	1215	7.241	0.895	5.874	8.835	3.64	0.275
Inflation	1215	9.274	6.382	−2.113	45.763	1.67	0.599
Government expenditures on education	1215	4.328	1.257	1.274	8.423	2.58	0.387
Government expenditures on health	1215	3.871	1.615	0.712	9.185	2.96	0.338

The average for government effectiveness indicates that the region’s institutions are weak. This indicates issues with governance, policy execution, and service provision, necessitating reforms to enhance the public sector’s accountability, efficiency, and effectiveness. The average for natural resource rent indicates that resource income is significantly important. This indicates that economies remain highly susceptible to fluctuations in pricing beyond their control. This underscores the significance of diversifying and investing in sectors beyond resources to maintain resilience.

The average GDP per capita indicates that the income level in Sub-Saharan Africa is relatively low. This indicates that poverty and inequality will persist; so, we must reform

current practices to ensure that all individuals benefit from growth, thereby enhancing living standards and well-being. The inflation average indicates significant price volatility in the region. Macroeconomic instability jeopardizes consumer purchasing power and investor confidence; hence, prudent fiscal and monetary policies are essential for long-term economic stability.

The government's average expenditure on education indicates a lack of commitment to the sector. This indicates a scarcity of possibilities for skill enhancement, underscoring the necessity of increased investment in education to elevate future productivity. The government's average expenditure on health indicates a limited investment in healthcare. This indicates that the system lacks robustness and the services are subpar. This underscores the significance of increasing funding to enhance public health and well-being.

The variance inflation factor indicates the degree of correlation among the independent variables within the model. This can help identify multicollinearity, which can distort regression outcomes and interpretations. The inverse of the variance inflation factor indicates tolerance, representing the proportion of variance not accounted for by other predictors. Elevated tolerance levels signify less collinearity concerns, hence improving the reliability of regression coefficients. The results indicate that multicollinearity is not a significant issue, as all variance inflation factor values remain below the conventional threshold of 5 [88,89]. This indicates that the estimated relationships are consistent and can be utilized to formulate conclusions.

Matrix correlation indicates the strength and direction of the linear relationship between two variables. The correlation results among the independent variables in this study reveal relatively moderate associations, as presented in Table 6. All coefficients are below 0.70 [88,92]; hence, multicollinearity is absent. This indicates that the predictors are distinct, providing unique and reliable information, which ensures that the regression estimates are consistent and reliable.

Table 6. Matrix correlation analysis.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Social sustainability	1.000							
(2) Global Economic Policy uncertainty	0.324	1.000						
(3) Government effectiveness	0.287	0.251	1.000					
(4) Natural resource rent	−0.214	0.192	−0.358	1.000				
(5) Gross domestic product (GDP) per capita	0.365	0.338	0.413	−0.327	1.000			
(6) Inflation	−0.176	0.276	−0.198	0.241	−0.291	1.000		
(7) Government expenditures on education	0.298	0.217	0.302	−0.216	0.352	−0.173	1.000	
(8) Government expenditures on health	0.341	0.243	0.354	−0.183	0.389	−0.192	0.326	1.000

4.1. Testing of Hypothesis

Table 7 presents the results of the AMG estimator, which shows the effect of global economic policy uncertainty on social sustainability. This study evaluated the hypothesis decision based on the AMG estimator's results. The study found that global economic policy uncertainty had a significant negative effect on social sustainability. These findings aligned with the hypothesis (H1), leading to its acceptance and confirmation. Governance effectiveness and natural resource rents have a positive and significant moderating effect

on the relationship between global economic policy uncertainty and social sustainability. These results support hypotheses H2 and H3, thereby confirming and accepting them.

Table 7. Augmented Mean Group (AMG) estimator (findings).

Variables	Model 1	Model 2	Model 3
Global Economic Policy Uncertainty	−0.573 *** (0.031)	−0.462 *** (0.042)	−0.711 *** (0.027)
Government effectiveness	0.328 *** (0.046)	0.514 *** (0.038)	0.289 *** (0.051)
Natural resource rent	0.742 *** (0.025)	0.603 *** (0.033)	0.817 *** (0.019)
Gross domestic product (GDP) per capita	0.417 *** (0.039)	0.538 *** (0.029)	0.496 *** (0.036)
Inflation	−0.295 *** (0.052)	−0.387 *** (0.045)	−0.431 *** (0.037)
Government expenditures on education	0.843 *** (0.022)	0.612 *** (0.032)	0.724 *** (0.025)
Government expenditures on health	0.369 *** (0.049)	0.451 *** (0.042)	0.284 *** (0.053)
Global Economic Policy uncertainty × Government effectiveness		0.332 *** (0.051)	
Global Economic Policy uncertainty × Natural resource rent			0.573 *** (0.033)
CD-statistic	−0.732 0.215 *** (0.064)	−0.648 0.324 *** (0.058)	−0.701 0.291 *** (0.061)
Constant			
Number of observations	1215	1215	1215
Wald tests	512.46 ***	365.28 ***	427.15 ***
RMSE	0.221	0.291	0.253

*** $p < 0.01$.

4.2. Robustness Testing for Common Correlated Effects Mean Group (CCMG) Estimator

Table 8 presents the CCEMG estimate used to evaluate the robustness of the AMG estimator presented in Table 7. The principal difference between the two estimators lies in their coefficient estimates and standard errors, which arise from differences in their estimation approaches. The AMG addresses cross-sectional dependence by integrating a common dynamic process, while the CCEMG directly handles unobserved common elements through cross-sectional averages. Despite variations in the magnitude and precision of the coefficients, both methods consistently show that the impacts are uniformly directed, whether positive or negative. This consistency confirms the robustness of the results, providing strong evidence that the choice of estimator does not influence the identified relationships. This robustness enhances confidence in the validity of the findings and the strength of the research.

Table 8. Common Correlated Effects Mean Group (CCMG) estimator (Findings).

Variables	Model 1	Model 2	Model 3
Global Economic Policy uncertainty	−0.621 *** (0.042)	−0.538 *** (0.037)	−0.599 *** (0.041)
Government effectiveness	0.487 *** (0.038)	0.452 *** (0.031)	0.473 *** (0.036)
Natural resource rent	0.354 *** (0.027)	0.331 *** (0.029)	0.348 *** (0.028)

Table 8. *Cont.*

Variables	Model 1	Model 2	Model 3
Gross domestic product (GDP) per capita	0.276 *** (0.031)	0.249 *** (0.028)	0.268 *** (0.030)
Inflation	−0.492 *** (0.036)	−0.463 *** (0.034)	−0.481 *** (0.035)
Government expenditures on education	0.403 *** (0.029)	0.385 *** (0.030)	0.397 *** (0.031)
Government expenditures on health	0.569 *** (0.033)	0.544 *** (0.032)	0.561 *** (0.034)
Global Economic Policy uncertainty × Government effectiveness		0.587 *** (0.039)	
Global Economic Policy uncertainty × Natural resource rent			0.291 *** (0.027)
Number of observations	1215	1215	1215
Wald tests	432.15 ***	418.92 ***	427.84 ***
RMSE	0.426	0.439	0.431

*** $p < 0.01$.

4.3. Robustness Testing for Durbin–Wu–Hausman (DWH) Test

The Durbin–Wu–Hausman (DWH) test confirmed the presence of endogeneity among the explanatory variables, necessitating a more robust estimation strategy to examine the relationship among global economic policy uncertainty, government effectiveness, natural resource rents, and social sustainability. Accordingly, the study employed the two-step difference GMM estimator to address potential issues of reverse causality, omitted variable bias, autocorrelation, and heteroskedasticity in the dynamic panel framework.

In this study, social sustainability (HDI) was lagged by one period and included as a dynamic component to reduce simultaneity bias. All endogenous variables were instrumented using their lagged values from one to five periods to improve the consistency and reliability of the estimates. In addition, external instruments, including foreign direct investment (FDI), tax revenue, trade openness, and urbanization, were incorporated in their lagged forms. These variables were selected because prior literature suggests that they are closely associated with fluctuations in global economic policy uncertainty through their influence on external economic exposure, investment flows, fiscal conditions, and structural economic transformation. At the same time, their lagged values are less likely to exert a direct contemporaneous effect on social sustainability, thereby supporting the exogeneity assumption. The use of lagged instruments also helps minimize reverse causality and simultaneity concerns.

The reliability and validity of the GMM estimations were evaluated using several post-estimation diagnostic tests. The Arellano–Bond serial correlation tests showed significant AR(1) results but insignificant AR(2) statistics, suggesting that the model does not suffer from second-order serial correlation and confirming the appropriateness of the estimation approach. Furthermore, the Sargan and Hansen over-identification tests were statistically insignificant, while the Hansen test values remained within the recommended range of 0.10 to 0.30, supporting the validity and exogeneity of the instruments used in the analysis. The Wald test also indicated that the explanatory variables were jointly significant. In addition, instrument proliferation was minimized by ensuring that the number of instruments remained lower than the number of cross-sectional units, thereby reducing the risk of overfitting and improving the robustness of the results.

Overall, the results reported in Table 9 indicate that potential endogeneity issues were adequately addressed through the application of dynamic model specifications, appropriate lag structures, the use of both internal and external instruments, and comprehensive diagnostic testing. In addition, the consistency of findings from both the GMM and AMG estimators, particularly in coefficient signs and significance levels, provides further evidence of the robustness and reliability of the estimated relationships, despite minor differences in coefficient magnitudes and standard errors.

Table 9. Two step GMM results (Difference GMM).

Variables	Model 1	Model 2	Model 3
Social suitability (−1)	0.812 *** (0.307)	0.844 *** (0.228)	0.830 *** (0.349)
Global Economic Policy uncertainty	−0.636 *** (0.116)	−0.663 *** (0.016)	−0.653 *** (0.273)
Government effectiveness	0.703 *** (0.148)	0.730 *** (0.178)	0.715 *** (0.267)
Natural resource rent	0.882 *** (0.241)	0.881 *** (0.276)	0.881 *** (0.382)
Gross domestic product (GDP) per capita	0.330 *** (0.072)	0.353 *** (0.384)	0.333 *** (0.167)
Inflation	−0.481 *** (0.054)	−0.520 *** (0.051)	−0.496 *** (0.052)
Government expenditures on education	0.308 *** (0.033)	0.313 *** (0.035)	0.326 *** (0.039)
Government expenditures on health	0.238 *** (0.079)	0.242 *** (0.066)	0.209 *** (0.068)
Global Economic Policy uncertainty × Government effectiveness		0.200 *** (0.009)	
Global Economic Policy uncertainty × Natural resource rent			0.838 *** (0.130)
Number of observations	1163	1163	1163
AR(1)	0.000	0.002	0.001
AR(2)	0.643	0.661	0.669
Sargan	0.404	0.413	0.443
Hansen J-tests	0.129	0.136	0.143
Number of groups	45	45	45
Number of instrumental variables	31	32	36
Wald test	3.993 ***	4.183 ***	4.329 ***

*** $p < 0.01$.

4.4. Discussion of Empirical Findings

The study discovered that global economic policy uncertainty had a negative and significant impact on social sustainability. The findings align with the sustainable development theory, which emphasizes the interconnectedness of economic stability, social well-being, and environmental stewardship [21]. The theory asserts that sustainable progress cannot be achieved without consistent and inclusive economic governance. The observed negative impact supports this theoretical framework, as heightened policy uncertainty undermines the stability required for inclusive social development [93].

Economic policy uncertainty often leads to delayed investment decisions, reduced government revenues, and erratic fiscal responses [9]. In regions where institutions are fragile, such as many Sub-Saharan African countries, uncertainty in global economic

policies—such as fluctuating aid, unpredictable trade terms, or monetary tightening in advanced economies—translates into reduced social spending and weakened welfare programs. This disruption limits access to education, healthcare, and employment, which are core pillars of social sustainability under the sustainable development theory [4]. Vulnerable groups are especially affected, exacerbating inequality and diminishing trust in institutions.

For investors, these results serve as a cautionary signal. High uncertainty creates volatile investment environments, increasing perceived risk and reducing the likelihood of long-term commitments in sectors that support social infrastructure. This undermines the potential for inclusive private-sector-led development. For governments, the implications are clear: mitigating the adverse effects of external policy uncertainty requires strengthening institutional resilience, diversifying the economic base, and prioritizing stable, transparent governance. Enhancing domestic policy credibility and investing in social programs during periods of uncertainty are vital for maintaining public trust and promoting equitable development. These strategies are critical for aligning short-term policy responses with the long-term goals of sustainable human development.

The study found that GDP per capita has a positive and significant relationship with social sustainability. These findings align with the sustainable development theory, which underscores the role of economic resources in advancing social well-being. As GDP per capita increases, governments and households typically gain more financial capacity to invest in social infrastructure such as education, healthcare, and housing—core components of social sustainability [94]. This supports the theory's assertion that economic growth, when inclusive and responsibly managed, can enhance social equity and resilience.

Higher GDP per capita often translates into better employment opportunities, improved access to essential services, and reduced poverty, all of which contribute to a more cohesive and stable society [95]. This reinforces the importance of economic prosperity as a foundation for long-term social development.

For investors, rising GDP per capita signals stronger consumer markets and more stable socio-economic conditions, which are conducive to sustained investment. For governments, it provides the fiscal space to expand social protection, strengthen institutions, and implement policies that foster inclusive and equitable development outcomes.

It was revealed that the inflation rate had a negative and significant impact on social sustainability. These findings are consistent with sustainable development theory, which emphasizes that economic stability is essential to advancing social equity and well-being. High inflation erodes purchasing power, disproportionately affecting low-income households by raising the cost of basic goods and services, including food, healthcare, and education [96]. This undermines access to essential needs and widens social inequality, counteracting the goals of inclusive development outlined by the theory.

Persistent inflation also weakens government capacity to fund and maintain social programs, especially in countries with limited fiscal space [97]. Uncertainty caused by fluctuating prices reduces investment in human capital, hampers long-term planning, and increases social unrest, challenges that directly threaten sustainable development.

For investors, high inflation signals macroeconomic instability and increased operational risk, discouraging investment in socially beneficial sectors. For governments, it highlights the need for sound monetary and fiscal policies that maintain price stability, protect vulnerable populations, and sustain long-term development programs aligned with social sustainability goals.

It was discovered that government expenditures on education had a positive and significant effect on social sustainability. These findings align strongly with the sustainable development theory, which advocates for investments that enhance social equity, inclusion, and long-term human development. Education is a cornerstone of social sustain-

ability, enabling individuals to access better economic opportunities, participate fully in society, and contribute to nation-building [98]. Increased government spending on education improves literacy rates, builds skilled human capital, and reduces intergenerational poverty—outcomes that are central to sustainable development [99].

By allocating more resources to education, governments create a foundation for inclusive growth and institutional stability. Educated populations are more likely to demand accountability, support democratic governance, and contribute to cohesive, resilient societies. For investors, a better-educated workforce enhances productivity and innovation, improving the business environment and long-term investment prospects. For governments, expanding education funding is a strategic tool to reduce inequality, promote inclusive development, and fulfill international commitments such as the Sustainable Development Goals (SDGs), particularly Goal 4: Quality Education.

The study revealed that government health expenditures had a positive and significant relationship with social sustainability. These findings aligned firmly with the sustainable development theory, which highlights the interdependence among economic development, environmental protection, and social well-being. Health is a fundamental component of social sustainability, as healthier populations are more productive, resilient, and able to participate meaningfully in economic and civic life [93]. Increased public spending on health services improves access to care, reduces mortality, and enhances overall quality of life, particularly for vulnerable groups [100].

Investing in health systems also strengthens societal cohesion and stability by addressing inequalities in healthcare access and outcomes [95]. It reduces the long-term burden of disease, supports workforce development, and fosters human capital—key elements in achieving sustainable and inclusive growth.

For investors, stronger health systems signal stability and institutional commitment to social welfare, making countries more attractive for long-term investments. For governments, sustained health investments are critical to reducing poverty, improving social outcomes, and meeting international targets such as Sustainable Development Goal 3: Good Health and Well-being.

The moderating effect of global economic policy uncertainty on governance effectiveness had a positive and significant impact on social sustainability. This is consistent with the sustainable development theory, which emphasizes the critical role of strong institutions in managing uncertainty and promoting equitable development. Effective governance enhances policy coordination, service delivery, and institutional trust—factors that can cushion the adverse effects of external economic shocks [101]. When governments are capable, transparent, and accountable, they are better equipped to respond proactively to global economic fluctuations and ensure that essential social services—such as education, healthcare, and social protection—are maintained even in times of uncertainty.

This result suggests that in countries with higher levels of government effectiveness, the adverse impact of global policy uncertainty on social outcomes is less severe. Efficient governance acts as a stabilizing force, promoting resilience and protecting vulnerable populations from the worst consequences of economic disruptions [102].

For investors, strong governance in uncertain environments signals institutional reliability, reducing investment risk. For policymakers, the findings reinforce the importance of strengthening institutional capacity and governance quality to safeguard social sustainability amid unpredictable global economic conditions. This underscores the value of investing in public sector reform, transparency mechanisms, and effective regulatory frameworks to enhance long-term developmental resilience.

The moderating effect of global economic policy uncertainty on natural resource rents had a positive and significant impact on social sustainability. This aligns with Sustainable

Development Theory, which emphasizes leveraging national resources to support inclusive and resilient development. When effectively managed, revenues from natural resource exploitation—such as oil, gas, or minerals—can provide governments with the fiscal space needed to sustain social investments during periods of external uncertainty [103]. These rents can help stabilize public budgets, support counter-cyclical spending, and protect essential services such as healthcare, education, and social safety nets even when global economic conditions are volatile.

The findings further suggest that countries with well-managed and effectively governed natural resource rents are better able to cushion the adverse social effects of global economic policy uncertainty [80]. This result is consistent with an emerging strand of the literature arguing that natural resources are not inherently a “curse” or a “blessing,” but rather their outcomes depend on the quality of governance and institutional arrangements.

In Sub-Saharan Africa, resource rents are more likely to enhance social sustainability when supported by strong institutional thresholds, such as transparent fiscal rules, credible oversight mechanisms, and rule-based resource revenue management. For instance, the existence of sovereign wealth funds with clear deposit and withdrawal rules, independent auditing of extractive revenues, and legally enforced budget stabilization mechanisms helps ensure that resource income is saved and smoothed over time rather than consumed inefficiently or politically diverted.

In addition, democratic accountability and strong public financial management systems play a critical role in determining outcomes. Where citizens and oversight institutions can effectively monitor resource use, rents are more likely to be allocated toward education, healthcare, and infrastructure, thereby strengthening social sustainability. Conversely, weak institutions increase the risk of rent-seeking, corruption, and pro-cyclical spending, reinforcing volatility and undermining social outcomes. In this sense, resource rents become a stabilizing force only when embedded within credible, transparent, and accountable governance frameworks.

For investors, the ability of resource-rich countries to maintain social cohesion amid global uncertainty signals greater economic resilience and a more predictable investment environment. For governments, the results emphasize the importance of establishing sound resource governance frameworks, such as sovereign wealth funds or fiscal rules, to ensure that resource revenues are used strategically and equitably to support long-term human development and reduce vulnerability to external economic shocks.

5. Conclusions and Implications

5.1. Conclusions

The increasing uncertainty in global economic policy presents considerable challenges for developing countries, with SSA particularly vulnerable due to their dependence on external economies and the fragility of their social frameworks. The effect of this uncertainty on social sustainability, as well as the moderating effects of governance effectiveness and natural resource rents, remains underexamined in the literature. This study addresses these underexplored gaps, using 27 years of panel data from 45 Sub-Saharan African countries, spanning 1997 to 2023, obtained from WDI, UNDP, WGI, and the EPU Project. The AMG, CCMG, and two-step difference GMM estimators were employed to analyze the retrieved data. The study discovered that global economic policy uncertainty had a negative and significant effect on social sustainability. Furthermore, the study revealed that governance effectiveness and natural resource rents positively and significantly moderate the relationship between global economic policy uncertainty and social sustainability.

5.2. Theoretical Implication

The results of this study have important theoretical implications, reinforcing the core principles of sustainable development theory. The findings demonstrate that economic stability, institutional quality, and resource management play a pivotal role in shaping equitable social outcomes. This affirms the theory's assertion that sustainable development is not solely about growth or environmental preservation, but rather about inclusive progress across all pillars. In this regard, policy frameworks must evolve to integrate economic resilience and institutional responsiveness into broader sustainable development goals. Countries should adopt integrated planning systems that align national development strategies with social inclusion indicators, ensuring that economic shocks do not derail long-term human development objectives.

Institutional theory further strengthens these implications by explaining how formal rules, governance systems, and regulatory quality shape the effectiveness of policy responses under uncertainty. The findings suggest that stronger institutions enhance policy credibility, reduce the transmission of uncertainty, and improve the consistency of social protection mechanisms during economic shocks. This highlights the need to refine existing sustainability frameworks to explicitly incorporate institutional strength as a structural determinant of social outcomes. Strengthening public administration systems, improving transparency and accountability mechanisms, and implementing performance-based governance assessments are practical steps that enhance institutional effectiveness in managing external shocks and safeguarding social development.

In addition, resource dependence theory provides further insight into the role of natural resource rents in shaping social sustainability. The results indicate that resource wealth can serve as a stabilizing force when managed effectively, enabling governments to reduce external vulnerability and sustain social investment during periods of global instability. This challenges the traditional view of resource dependence as purely negative and instead emphasizes the importance of strategic resource governance. Governments should implement transparent resource revenue frameworks, invest in long-term social infrastructure, and establish stabilization funds to ensure that resource rents function as a buffer against global economic uncertainty.

5.3. Policy Implication

The findings suggest that governments in Sub-Saharan Africa should strengthen institutional quality by implementing governance reforms that enhance transparency, accountability, and public-sector efficiency. Specifically, governments should digitalize public financial management systems, strengthen anti-corruption agencies, and adopt open-budget frameworks that allow citizens to monitor public expenditure. Strengthening the independence of audit institutions and judicial systems is also essential to reduce political interference and improve the management of public resources during periods of global economic uncertainty.

For resource-rich countries, governments should establish legally binding fiscal rules that allocate a fixed share of natural resource revenues to social sectors such as education, healthcare, and rural infrastructure. Establishing sovereign wealth funds with transparent reporting mechanisms can help stabilize public spending during external economic shocks. In addition, Sub-Saharan African countries should strengthen local-content policies in the extractive industries to increase employment opportunities and domestic value creation. Policymakers should also diversify their economies by investing in agriculture, manufacturing, and renewable energy sectors to reduce excessive dependence on volatile commodity exports.

Furthermore, regional institutions such as the African Union and regional economic communities should promote coordinated policy frameworks for resource governance, tax transparency, and control of illicit financial flows. Aligning national development plans with Agenda 2063 can help countries build resilient institutions, reduce inequality, and sustain social welfare amid global economic policy uncertainty.

5.4. Practical Implication

The practical implications of this study emphasize the importance of building resilient social systems that can withstand the negative effects of global economic policy uncertainty. For development practitioners, social planners, and civil society organizations, the findings suggest a greater need to support initiatives that enhance access to basic services—such as education, healthcare, and social protection—particularly in vulnerable and resource-dependent communities. Investing in community-based service delivery models, decentralizing health and education systems, and strengthening local institutions can ensure continuity of services even when national-level policies are disrupted by global shocks.

For private-sector stakeholders and investors, the results highlight the importance of institutional quality and governance effectiveness in shaping investment risks and opportunities. In countries where governments demonstrate strong capacity to manage uncertainty and allocate resources responsibly, there is a more stable environment for long-term investments. Businesses can respond by aligning their corporate social responsibility (CSR) programs with national development priorities, investing in social infrastructure, and supporting inclusive growth initiatives that reduce societal vulnerabilities.

Development agencies and policymakers working in natural resource-rich countries are also encouraged to apply resource revenues toward long-term human development goals. Creating transparent frameworks for natural resource management, investing in social capital, and establishing safety nets for at-risk populations are crucial practices to mitigate volatility and promote inclusive progress. These real-world strategies bridge the gap between theoretical insights and implementation, offering a practical roadmap for stakeholders to protect and enhance social sustainability in the face of global policy uncertainty.

5.5. Limitations of the Study and Future Directional Studies

This study has several limitations that should be acknowledged. First, the analysis focused only on Sub-Saharan African countries, which may limit the generalizability of the findings to regions with different institutional systems, economic structures, and resource management practices. Although the regional focus provides important context-specific insights, caution should be exercised when extending the findings to other developing or advanced economies.

Second, the study relied on secondary data obtained from international databases. In Sub-Saharan Africa, data quality, reporting consistency, and availability often vary across countries due to differences in statistical capacity, governance quality, and institutional development. Missing observations and measurement inconsistencies may therefore affect the reliability of some estimates.

Third, social sustainability was measured using the HDI. While HDI captures important dimensions such as health, education, and income, it may not fully reflect broader social issues, including inequality, social cohesion, institutional trust, and access to social protection. Future studies could therefore incorporate additional indicators such as multidimensional poverty, gender equality, and quality of public services.

Finally, despite the use of robust econometric techniques, some methodological limitations may remain, including potential endogeneity, omitted variable bias, and difficulty

capturing all country-specific factors influencing social sustainability. Future research may address these limitations by employing alternative methodologies, conducting country-level case studies, or incorporating additional moderating variables such as political stability, technological readiness, and green public investment.

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