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Fiscal multipliers and structural economic characteristics: Evidence from countries in sub-Saharan Africa

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Abstract

Output response to discretionary fiscal policy is a key aspect of examining various theories, findings of empirical studies and delivering guidance to policymakers. This study analyses the output response to unanticipated fiscal spending shocks under several structural economic characteristic factors, including business cycle states, debt burden, openness of the economy, exchange rate regimes and political governance regime, using annual data from 40 countries in SSA spanning from 2000 to 2019 in a panel threshold vector auto-regression model. The findings indicate that fiscal spending multipliers have much larger effects on output in times of recession, in economies operating under lower trade openness, a fixed exchange rate, low-debt burden, restricted capital mobility, less financial development and a democratic governance regime. Based on the results, the discretionary countercyclical fiscal policy and optimal fiscal policy action are recommended. Moreover, in order to have effective fiscal policy must target hand-to-mouth consumers (non-Ricardian consumers) and firms with limited liquidity, concentrating on social services and social protection to increase short-term demand. Likewise, A proper fiscal monetary policy mix should be considered with other structural measures to maximising the positive effects of the fiscal expansion.

KEYWORDS
fiscal multiplier, panel TVAR, SSA countries

1 | INTRODUCTION

As the result of global financial turmoil in 2008, fiscal policy tools sparked the attention of many governments and scholars across the world for their role in mitigating the negative impacts of crises on economic growth. The financial turmoil turned the primal interest of policymakers to focus on fiscal stimulus packages than monetary transmission mechanisms. The monetary policy shocks could not offset the massive contraction in demand, with many countries' interest rates reaching a lower bound of nearly zero (Spilimbergo et al., 2008). Despite of its classic theme in macroeconomic policy, the effect of discretionary fiscal spending shocks and the channels through which the key features of the economies affect fiscal policy have become a source of debate among economists due to the endogeneity nature of fiscal policy. Nevertheless, determinants and magnitude of fiscal innovations under countries' structural characteristics are debated in the literature, and little consensus has been reached.

Several studies distinguish the asymmetric response of output[1] to a discretionary fiscal policy under various key economic factors (e.g. Auerbach & Gorodnichenko, 2013a, 2013b; Baum et al., 2012; Honda et al., 2020; Ilzetzki et al., 2013; Koh, 2016; Ramey & Zubairy, 2018). In general, the results of these papers reveal that the response of output to discretionary fiscal policy varies with economic development levels, economies' business cycles, debt burdens, exchange rate regimes, levels of economic openness, political regimes, and monetary accommodation. However, only a few papers employ a nonlinear response of output to discretionary fiscal policy in SSA countries. As Blanchard – Leigh (2013) documents inaccurate estimation of fiscal multipliers can lead to significant growth forecast errors which have important consequences in the design of macroeconomic policies; for instance, in setting unrealistic fiscal targets on fiscal balance and public debt. Therefore, estimating fiscal impulses using panel TVAR is found pivotal to compare the differences between the multipliers in economic characteristics.

Despite many policymakers and scholars agreeing on the interdependence among fiscal policy, real output and macroeconomic variables, a consensus has not yet been reached regarding the magnitude and persistence of fiscal impulses on output in developing countries. For example, in reference to developing countries (Appendix 1), panel studies using different quantitative models predict heterogeneous size values of multipliers, that is, −0.03% (Ilzetzki et al., 2013), 0.17% (Estevão & Samaké, 2013), 0.48% (Kraay, 2014), 0.39% (Contreras & Battelle, 2014), 0.63% (Koh, 2016), 0.2% (Furceri & Li, 2017), 0.7% (Shen et al., 2018), 0.7% (Arizala et al., 2020), 0.1% (Honda et al., 2020), 0.81% (Sheremirov & Spirovska, 2022) and 0.06% (Woldu, 2022) all demonstrating considerable heterogeneity and persistent fiscal impulses.

Moreover, there is a long-standing debate about the contemporaneous effects of fiscal policy and its transmission mechanisms both in theory and practice. In addition, the literature on the size and persistence of fiscal multipliers in developing countries, whether they are larger or smaller than those in other developed and emerging economies, remains unclear. As discussed by the IMF (2014) and Honda et al. (2020), developing countries have a lower monetary response to output; lower automatic stabilisers; and a higher rate of unemployment, which may result in larger fiscal multipliers. On

[1]In our paper 'GDP' and 'output' are used interchangeably.

the other hand, low precautionary saving, economic openness and a more volatile environment may dampen fiscal effects.

It is essential to investigate fiscal spending innovations in SSA countries, irrespective of the voluminous literature on fiscal policy effects in the developed world and cross-country studies in developing countries. As Shen et al. (2018) asserted, low-income countries (LICs) differ from developed countries based on three primary features affecting fiscal financing effects of high reliance on external financing, low spending efficiency, and high import intensity in public capital spending, called 'low degree of home bias'. Moreover, Honda et al. (2020) highlighted the main characteristics of LICs that policymakers must systematically explore. These include widespread poverty, soaring unemployment, considerable social needs, serious indebtedness, sizeable informal labor markets, and the asymmetric effects of discretionary fiscal policy shocks. This demands research to establish an accurate forecast of fiscal policy in stimulating real GDP (Honda et al., 2020).

In addition to adding to the limited studies attempting to explore output response to discretionary fiscal policy in SSA countries (Arizala et al., 2020) and LICs (Honda et al., 2020), the value added of this study is threefold. First, to the best of our knowledge, this study is the first paper to estimate the asymmetric effects of fiscal policy using panel threshold vector auto-regression (TVAR) which is scarce in the SSA literature. In addition, it also differs from the paper of Arizala et al. (2020) in terms of fiscal shock identification and methodology. Second, this study extends the scope of previous research by estimating the fiscal multipliers under a variety of structural and conjunctural factors using a broad set of SSA countries and recent dataset focusing the peculiar characteristics of SSA economies. Third, the study is the first paper that investigates empirically the output effect of unexpected fiscal spending shocks under democratic and autocratic governance regimes.

The study raises five questions to be addressed. To what extent does the size of the fiscal multipliers vary over fluctuations in economic cycle? Does debt burden determine fiscal multipliers' sign, size and persistence? Is trade openness a factor to the response of output to discretionary fiscal policy? Does the size of fiscal innovations vary under fixed and floating exchange rate regimes? Does the fiscal multiplier depend on the degree of international capital mobility? Does the multiplier depend on the degree of financial development, if so, how strongly? Does political regime determine fiscal multipliers' sign, size and persistence? We address the research questions by estimating determinants of fiscal multipliers, focusing on a nonlinearity assumption using a panel TVAR model. The results suggest that economies with a lower propensity to trade during downturns, low-debt burden, fixed exchange rates and democratic governance are related to larger and more persistent impulse responses.

The chapter is structured as follows. Section 2 reviews the literature on the identification strategies of fiscal shocks and determinants of fiscal spending shocks under various key economic characteristics. Section 3 provides an overview of the datasets and methodological approach. Section 4 presents with the findings and discussion followed by robustness checks. Summary of the chapter is presented in Section 5.

2 | LITERATURE REVIEW

Two schools of theoretical thought prevail, Keynesian and neoclassical models, with different predictions on output response to discretionary fiscal policy, particularly related to the response of private consumption. The former explains the effects through the demand side, whereas the latter describes fiscal impulses through supply-side effects. Neoclassical models argue that a discretionary fiscal policy that is matched by a rise in taxes in the future results in the loss of households' wealth. This leads to reductions in consumption and leisure activities and in labor supply, driving down the

wage rate, which leads to an output rise. Conversely, the Keynesian theory predicts that due to sticky nominal wages and prices, private consumption increases with an expansionary fiscal policy (Galí et al., 2007); thus, fiscal expansion financed by lump-sum taxes raises labor supply, leading to an increase in real wages. Subsequently, the consumption of non-Ricardian consumers will increase because of the positive response to labor income, leading to increased aggregate demand and further growth in GDP and employment.

Exogenous fiscal shocks in the literature are primarily identified using five approaches. The first is Blanchard and Perotti's (2002) approach, the structural vector auto-regressions (SVARs) model, which assumes that fiscal innovations do not respond to macroeconomic shocks to the economy in the same period and/or quarter. Mountford and Uhilig (2009) use an alternative approach to SVAR in which the sign restrictions address the parametric identification problems by imposing signs on the variables. The second approach is the narrative approach, relying on military buildups as an identification strategy, as military expenditure is orthogonal to output fluctuations (Barro & Redlick, 2011; Ramey, 2011, 2016). This approach is much more problematic for small open economies, as such countries generally have a small military buildup. The possible existence of other fiscal shocks can simultaneously affect the exogeneity of fiscal shocks. The third fiscal shock identification strategy was developed by Kraay (2012, 2014) and uses loans from official creditors as orthogonal and unanticipated drivers of fiscal spending shocks. The fourth method uses forecast errors to assess exogenous fiscal policy shocks while addressing the fiscal foresight problem and the likely counter loop from the current economic state (Auerbach & Gorodnichenko, 2013a). The fifth shock identification strategy is dynamic stochastic general equilibrium approach that assesses the Keynesian predictions for simulating fiscal policy impact on growth. DSGE models have been subject to various challenges, including the difficulty of modelling fiscal policy and incorporating nonlinearity (Cogan et al., 2010; Smets & Wouters, 2007).

In this study, we use a panel TVAR approach allowing for the asymmetric responses of fiscal spending shocks. A panel TVAR model is selected in this study for several reasons. First, the model captures the nonlinear reactions easily to accommodate a nonlinear specification of fiscal policy. Second, the model is advantageous in that the regime variable can itself be an endogenous variable and helps to switch the regime variable following the shock (Afonso et al., 2018; Baum & Koester, 2011; Dime et al., 2021; Ferraresi et al., 2015; Hlaváček et al., 2021; Nuru, 2020; Shaheen & Turner, 2020). This study uses annual data to assess fiscal spending shocks for various reasons. First, noninterpolated long series quarterly data are unavailable for SSA countries. Second, fiscal policy decisions are made on an annual basis, therefore raising the likelihood of predicting actual shocks. Third, the probable response of fiscal policy to existing economic conditions is unlikely to be anticipated by agents after 1 year (Koh, 2016; Leeper et al., 2013; Ramey, 2011). Fourth, it has the advantage of minimizing the risks associated with seasonal changes and a plethora of studies postulated that spending shocks using annual data of recursive identification restrictions VAR model produces plausible results in comparison to those of noninterpolated quarterly fiscal data applying for different countries (e.g. Beetsma et al., 2006, 2009; Beetsma & Giuliodori, 2011; Born & Muller, 2012; Koh, 2016).

The determinants and size of fiscal impulses depend on countries' structural characteristics. We explain the factors, theoretical predictions and empirical justifications below.

1. Economic cycle fluctuations: The effects of a discretionary fiscal policy on real GDP are larger in downturns than in expansions (e.g. Hlaváček et al., 2021; Honda et al., 2020; Ilzetzki et al., 2013; Koh, 2016; Sedighi et al., 2021; Woldu, 2022). In times of recession, the availability of excess capacity in the economy raises the effectiveness of fiscal policy due to the decreased likelihood of

crowding-out private spending. Furthermore, agents with binding liquidity constraints can borrow to smooth (maintain) consumption and production, thus increasing output.

2. Degree of monetary policy accommodation: The literature argues monetary policy accommodation amplifies the stimulus effect of a temporary fiscal expansion by keeping the interest rate constant to provide larger multiplier effects on output (Batini et al., 2014). We explore two channels through which the stance of monetary policy may impact the effectiveness of fiscal policy: exchange rate regime and international capital mobility.
   a) Exchange rate regimes: Fiscal shocks exert sizable fiscal impulses under fixed exchange regimes as compared to floating exchange regimes because leakage through currency appreciation is minimal (Born et al., 2013; Ilzetzki et al., 2013). Under a floating exchange rate regime, fiscal expansion puts upward pressure on interest rates and amplifies capital inflows and leads to domestic current appreciation. This, in turn, crowds-out net exports and eventually offsets the effect of increased public spending on the demand for domestic goods. Under fixed exchange rates, in contrast, monetary policy accommodates the increased demand for domestic currency and prevents the appreciation of domestic currency to stimulate the private demand, while net exports remain unchanged (Born et al., 2013).
   b) International capital mobility: the magnitude of the fiscal multiplier varies with the degree of capital mobility larger with lower degree of capital mobility (Corsetti et al., 2012; Koh, 2016). According to the Mundell–Fleming and Keynesian models, in a small open economy under flexible exchange rate regime and perfect capital mobility, expansionary fiscal policy leads to domestic currency appreciation due to a rise in output and interest rates consequently revert the potency of fiscal policy (Mora & Acevedo, 2019). Likewise, the stimulus effect of fiscal policy increases with a lower the degree of capital mobility under floating exchange rates. Moreover, when the economy is dealing with fixed exchange rate, then the degree of capital mobility enhances the size of the fiscal multiplier.

3. Financial development: the potency of fiscal policy also depends on the degree of fiscal development with an ambiguous effect depending on the response of credit-constrained agents and the government's ability to finance the fiscal deficit (Koh, 2016; Spilimbergo et al., 2008). Fiscal policy has a lower multiplier at a higher degree of financial development due to agents facing lower credit and liquidity constraints and the availability of more savings possibilities for consumption smoothing. Moreover, in countries with limited access to financial markets, governments can only issue debt to finance deficits at high-interest rates, which decreases the potency of fiscal policy. Conversely, a higher degree of financial development means more financing options for consumption and henceforth amplifies the fiscal multipliers (Koh, 2016; Sedighi et al., 2021).
4. Degree of indebtedness: Highly indebted economies experience lower multipliers (Ilzetzki et al., 2013) because of the anticipation of forward-looking agents paying higher taxes sooner, possibly reducing the effect of increased government spending to magnify negative wealth effects (Alichi et al., 2019; Furceri & Li, 2017; Ilzetzki et al., 2013; Koh, 2016).
5. Degree of openness to trade: The more an economy is open, the larger demand leakage when government spending increases; hence, openness has a lower output response to fiscal expansion (Ilzetzki et al., 2013).
6. Political regimes: In an environment of democratic regime governance, fiscal multipliers can potentially have a higher impact on output because superior institutional quality could maintain stability in the macroeconomic environment (Rodrik, 2008), and economies with better democratic governments leverage physical and human capital resources more efficiently to ensure that fiscal expansion responds positively to output (Acemoglu et al., 2001).

3 | MATERIALS AND METHODS

This study's dataset was constructed annually, spanning from 2000 to 2019, for 40 SSA countries, namely, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Democratic Republic of the Congo, Republic of Congo, Côte d'Ivoire, Equatorial Guinea, Eswatini, Ethiopia, Gabon, The Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Seychelles Sierra Leone, South Africa, Tanzania, Togo, Uganda and Zambia. Our dataset primarily relies upon World Economic Outlook, World Development, the Polity IV database, Darvas (2020), Chinn and Ito (2020), and Ilzetzki et al. (2019, 2021) as data sources (Table 1).

3.1 | Methodology

We apply a panel TVAR model varying deterministic conditioning to the structural characteristics of the countries, which is specified as follows:

$$y_{it} = \propto_1 y_{it} + \beta_1(L)y_{i,t-1} + \left[\propto_2 y_{it} + \beta_2(L)y_{i,t-1}\right] * I(S_{t-d} > \gamma) + \omega_i + \varepsilon_{i,t} \quad (1)$$

where y_{it} is a five-dimensional vector of the endogenous variables of government spending, output, government revenue,[2] current account deficit to GDP fraction and real effective exchange rate (REER). All the endogenous variables are in real and logarithmic values, except for the current account deficit to GDP fraction. (L) is a lagged polynomial matrix and ω_i is a time-invariant common linear trend introduced to control unobserved heterogeneity. I is the threshold variable that takes the value of 1 if, from the structural and transient factors are higher than the threshold value γ, and 0 otherwise. $\propto_1 y_{it}$ *and* $\propto_2 y_{it}$ are the contemporaneous terms. ε_{it} is the vector of uncorrelated structural shocks. The structural characteristics of the economies are treated as the threshold variables. To consider the features of an open economy in most SSA countries, the ratio of current account deficit to GDP fraction and REER is included in our study. Second, all the variables are used as first differences to interpret the impulse responses as elasticities. Furthermore, the whole data are divided into two subsamples corresponding to the thresholds based on the structural and transient factors.

Fiscal shocks are identified by a recursive identification of a Cholesky decomposition with the ordering $[\Delta spending \Delta gdp \Delta revenue \Delta CAB_{GDP} \Delta reer]$. The impact multiplier is expressed as the response of real GDP changes to a unit shock in the fiscal stances. The fiscal multiplier is then calculated as follows:

$$Impact\ multiplier = \frac{\frac{\Delta lnY_t}{\Delta lnG_t}}{\frac{\bar{g}}{y}} \quad (2)$$

[2]Tax revenue is proxied by government revenue, since noninterpolated long-term annual data on tax revenue for SSA countries are unavailable.

The cumulative fiscal impulses represent the cumulative change in real GDP in year T relative to the cumulative effects of an exogenous discretionary fiscal spending change during a given period.

$$Cumulative\ multiplier = \frac{\frac{\sum_{j=0}^{N} \Delta\, lnY(t+j)}{\sum_{j=0}^{N} \Delta\, lnG(t+j)}}{\frac{\breve{g}}{y}} \tag{3}$$

TABLE 1 Data source and data definition.

Variable	Definition of variables	Data source
Fiscal spending	General government expenditure divided by a GDP deflator	World Economic Outlook-IMF
Fiscal/government revenue	General government revenue deflated by a GDP deflator	World Economic Outlook-IMF
Real output	GDP in local currency divided by a GDP deflator	World Economic Outlook-IMF
Output deflator	GDP deflator expressed by the base year of each country's national accounts	World Economic Outlook-IMF
REER	Real effective exchange rate (CPI based) data for 171 trading partners' countries	Data generated from http://bruegel.org/publications/datasets/real-effective-exchange-rates-for-178-countries-a-new-database
Output Gap	Upturns and economic slacks are calculated based on the difference of GDP from the Hodrick–Prescott trend using the standard smoothing parameter of 100	Authors' calculation
Exchange rate regimes	Based on fine classification constructed referencing Ilzetzki et al.'s (2013) classification Fixed exchange rate regime: fine classification 1–8 Flexible/floating exchange rate regime: fine classification 9–15	Ilzetzki et al. (2019, 2021)
International capital mobility	Chinn-Ito normalised index Low mobility: Index ≤ global median High mobility: Index > global median	Chinn and Ito (2020)
Financial development	Domestic credit to private sector (% of GDP) Low credit: Credit % GDP ≤ 50% High credit: Credit % GDP > 50%	WDI, World development indicators, World Bank
Government Debt as % age of GDP	General government gross debt as % age of GDP constructed following Ilzetzki et al.'s (2013) classification Low indebted countries: ≤60% of Debt % GDP High indebted countries: >60% of Debt % GDP	World Economic Outlook- IMF
Trade openness	Trade (% of GDP) constructed following Ilzetzki et al.'s (2013) classification Open economy: Trade % GDP > 60% Closed economy: Trade % GDP ≤ 60%	WDI, World development indicators, World Bank
Political regime	Polity2: Democracy and autocracy indicators (from −10 to 10). The median of the distribution is used as a cutoff point for low- and high-quality institutions	Polity IV database

Source: Authors' computations.

4 | RESULTS AND DISCUSSION

4.1 | Summary statistics

Table 2 shows the summary statistics of the endogenous variables used in the paper for the period 2000–2019. Over the study period, the average real government spending of the 40 countries is 2191.84 in local currency units (LCUs), with the lowest value of 1661.05 in LCUs and the highest value of 2617.99 in LCUs. The real GDP value for the sampled countries over the study period is an average of 2349.25 in LCUs, and the mean value of real government revenue is 2181.16 LCUs. The average current account deficit–GDP ratio is −4.97, with a standard deviation of 9.54 for the study period. The REER has an average value of 462.53 for the sampled period, with a standard deviation of 16.76.

4.2 | Cross-sectional dependence test

In this paper, the Pesaran (2004) cross-sectional dependence (CD) test is employed to assess cross-sectional independence. The null hypothesis of cross-sectional independence does not accept in our study for both individual and group variables. As can be revealed in the results, the *abs* option, Frees' and Friedman's CD tests, the null hypothesis for both the individual variables and the group rejects the cross-sectional independence (Table 3).

4.3 | Unit root test

Owing to the acceptance of cross-sectional dependence in the data, we ran the Pesaran (2007) cross-sectionally augmented (CIPS) stationarity test. Table 4 presents the unit root test results with CIPS values. The results indicate that the model rejects the null hypothesis for real public spending, real fiscal revenue, ratio of current account deficit to GDP and real effective exchange rate, revealing that these variables are I (0), whereas the real GDP is stationary after first differencing (Table 4).

The optimal lag order selection criteria test was performed with standard information criteria. Table 5 presents the lag order selection based on the lowest values of MBIC, MAIC and MQIC.

4.4 | Fiscal spending shocks over a business cycle of an economy

Fiscal multipliers have asymmetric effects over an economy's business cycle. In this study, the business cycle is obtained based on the short-run fluctuations of actual and potential output from

TABLE 2 Summary statistics.

Variables	Obs	Mean	SD	Min.	Max.
Log (spending)	800	2191.84	215.37	1661.05	2617.99
Log (GDP)	800	2349.25	232.31	1766.65	2787.72
Log (revenue)	800	2181.16	216.13	1675.86	2592.07
Log (REER)	800	462.53	16.76	392.47	583.04
CAB–GDP ratio	800	−4.97	9.54	−84.11	24.01

Source: Authors' computations.

the Hodrick–Prescott trend. Figure 1 presents the response of an output to a unit shock of fiscal spending over a business cycle fluctuation. To obtain the fiscal multipliers, we multiply the impulse responses with the mean GDP-spending ratio. As depicted in Figure 1, a 1% increase in an unanticipated fiscal spending shock, in the year of implementation, raises output by 0.07% without considering the business cycle. However, the fiscal multipliers, on impact, exhibit a larger impact multiplier

TABLE 3 Cross-sectional dependence test.

Variable	CD test	*p*-Value	Corr	Abs (corr)
Log (spending)	46.76	.000	0.674	0.679
Log (GDP)	66.11	.000	0.953	0.953
Log (revenue)	39.62	.000	0.571	0.612
CAB–GDP ratio	5.13	.000	0.074	0.284
Log (REER)	6.76	.000	0.097	0.460

CD test values	*p*-Value
Pesaran's test of cross-sectional independence = 16.84	Pr = .0000
Friedman's test of cross-sectional independence = 114.78	Pr = .0001
Frees' test of cross-sectional independence = 3.91	Critical values from Frees' Q distribution
	alpha = .10:.14 alpha = .05:.19 alpha = .01:.26

Source: Authors' computations.

TABLE 4 Second-generation unit root test.

Level (intercepts only)					First difference (intercepts only)
		Critical values			
		10%	5%	1%	
Variables	CIPS	−2.11	−2.2	−2.36	CIPS
Log (spending)	−2.24**				
Log (GDP)	−1.43				−3.69***
Log (revenue)	−2.30**				
CAB–GDP ratio	−2.179*				
Log (REER)	−2.34**				

Note: *, ** and *** indicate level of significance at 1%, 5% and 10% respectively. Critical values are reported at 1%, 5% and 10%.
Source: Authors' computations.

TABLE 5 Optimal lag order selection.

Lag	CD	J	J *p*-Value	MBIC	MAIC	MQIC
1	0.65	110.68	.004	−363.91	−39.32	−166.06
2	0.73	90.75	.0003	−225.65	−9.25	−93.75
3	0.61	39.93	.03	−118.26	−10.06	−52.31

Source: Authors' computations.

in slumps of 0.09% and 0.024% in a boom and no statistically significant effect thereafter, that is, the fiscal multiplier tapers off following after the shock period for both business cycles. The findings support the arguments of traditional Keynesian models, asserting that a discretionary fiscal policy is a sounder in times of a negative output gap in which there are excess capacities available in an economy that are likely to have less crowding-out effects from private investment. Second, because of the high share of the 'hand-to-mouth' population and binding liquidity constraints for credit-constrained agents in SSA countries, a fiscal shock would loosen these constraints, leading to households' increasing marginal propensity to consume. Although our estimates are consistent with the results of (Alichi et al., 2019; Gechert & Rannenberg, 2018; Honda et al., 2020; Koh, 2016; Sedighi et al., 2021; Sheremirov & Spirovska, 2022), the value of the multipliers is found to differ significantly across the studies (Table A1). This mainly be explained by the application of variation in estimation methodologies, differences in the sampling of countries and data period, and identification of fiscal shocks.

To complement the short-to-medium term multipliers, we compute cumulative multipliers realizing the lags in GDP response and fiscal stimulus packages are built over time. In Figure 1, the cumulative multiplier of fiscal spending shocks both in a linear setting as well as in a state-dependent setting is displayed. The cumulative impulse response of the fiscal innovations in linear, recession, and expansion, on average, equals 0.011%, 0.015%, and 0.004%, respectively, for the 5-year horizon (Figure 1). The result reveals that the exogenous cumulative government spending shock effect on output is gauged to be more sizable in downturns than in upturns mainly due to the higher crowding-out of private demand in the expansion period than in a recession period.

4.5 | Fiscal multipliers and debt burden

The fiscal multipliers for high-debt countries and low-debt countries are estimated separately. To examine the effect of debt burden on the multiplier size, we split the sample into high-debt countries and low-debt countries, based on a 60 % of public debt to GDP ratio following the prominent papers of (Ilzetzki et al., 2013; Kabashi, 2017; Koh, 2016). The output response to a discretionary fiscal spending shock varies with countries' debt burden. As Figure 2 reveals, on impact, the elasticity of fiscal policy shocks to output for low-indebted countries is 0.08%, and the impact response then dissipated thereafter implying that a large part of the efficacious of fiscal policy is realized within the shock period. For highly indebted countries, the largest effect at the shock period is 0.04%, and tappers off following the shock year and not statistically significant except the shock period.

Our findings indicate that highly indebted countries tend to have smaller fiscal multipliers. Three reasons could justify this finding. First, because of the anticipation of forward-looking agents paying higher taxes in the future, possibly reducing the effect of increased government spending to magnify negative wealth effects. Second, the resources used for injecting new spending in highly indebted countries can deter domestic borrowing mainly if the holdings of the public debt are absorbed by domestic banks. Third, increasing public debt to finance deficit spending leads to an increase in interest rates and crowd-out private investment. on the other hand, increased interest rates lower asset values and have a negative wealth effect to discourage private consumption. Our estimates are consistent with the estimates documented by (Alichi et al., 2019; Corsetti et al., 2012; Furceri & Li, 2017; Ilzetzki et al., 2013; Kabashi, 2017; Koh, 2016).

Furthermore, the cumulative fiscal multiplier of low indebted countries is sizable and more persistent than of highly indebted countries (Figure 3). Figure 3 also shows evidence that an increase in

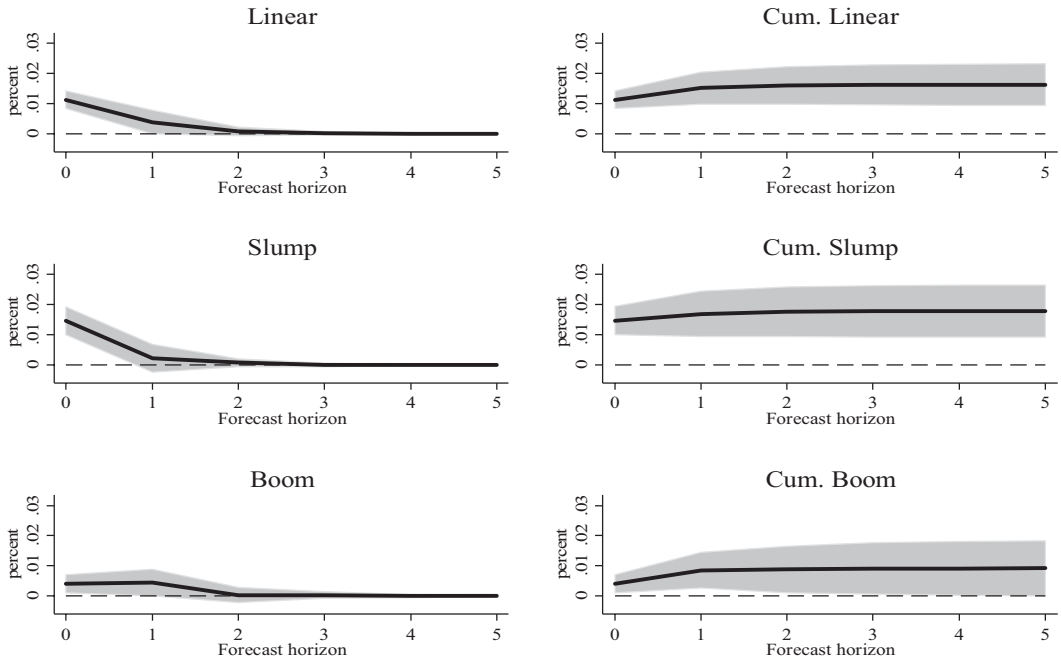

FIGURE 1 Fiscal multiplier over business cycle fluctuations. *Note*: The solid line displays percentage response, and the shaded areas represent 95% CI by 1000 Monte Carlo simulations. *Source*: Authors' computations.

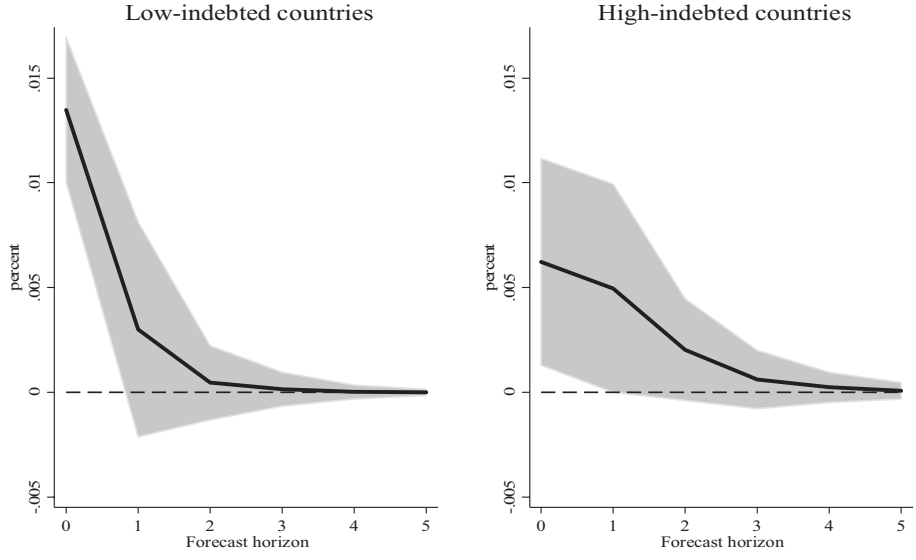

FIGURE 2 Fiscal multipliers and debt burden. *Note*: The solid line displays percentage response, and the shaded areas represent 95% CI by 1000 Monte Carlo simulations. *Source*: Author's computations.

government spending shocks, in the long run, tend to have larger multiplier in low indebted countries than in highly indebted countries and the difference is statistically significant for the five forecast horizons.

4.6 | Fiscal spending shocks and economic openness

In this study, following the prominent papers of Ilzetzki et al. (2013), an open economy is defined if the average share of total trade (exports plus imports) to GDP is greater than 60% whereas closed (less open) economy if the share is below or equal to 60% of GDP. Fiscal impulse multipliers vary with the openness of economies. Figure 4 presents the fiscal impulses obtained under economies with a lower propensity to import and higher openness to trade. The response of output to structural shocks of fiscal spending under a closed economy is 0.09%, whereas it is 0.04% under those open to trade. The finding suggests that fiscal policy expansions have a demand leakage that is more pronounced by imports to open economies as part of the increment in government spending. Moreover, an injection in government spending in an open economy appreciates the domestic currency and reduces the current account balance. The results support the Keynesian model and are congruent with conclusions reached by Ilzetzki et al. (2013), Koh (2016), Furceri and Li (2017), Shen et al. (2018), Sheremirov and Spirovska (2022) and others.

Figure 5 depicts the long-run multiplier suggesting that economic openness is the primary determinant of fiscal multipliers, with larger cumulative impulse responses under economies with a lower propensity to import than those open to trade. The result is statistically significant for the 5-year forecast horizon (Figure 5).

4.7 | Fiscal multipliers and exchange rate regimes

The exchange regime variable is obtained based on the fine classification of Ilzetzki et al. (2019, 2021). The variable takes values from 1 to 15 where above 8 values correspond to a flexible exchange rate regime and below or equal to 8 corresponds to a fixed exchange rate regime. In our sample, the elasticity of fiscal multipliers differs with exchange rate regimes and is more potent under the peg exchange rate regime. A 1% increase in fiscal spending under a floating exchange rate regime increases in response to a 0.05% increase in output. The output response to an exogenous fiscal policy under fixed exchange rate

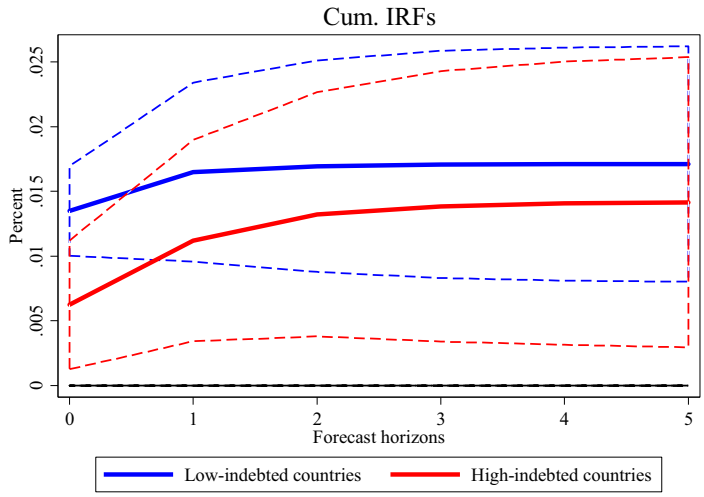

FIGURE 3 Cumulative IRFs under high- and low-debt economies. *Source*: Author's computations.

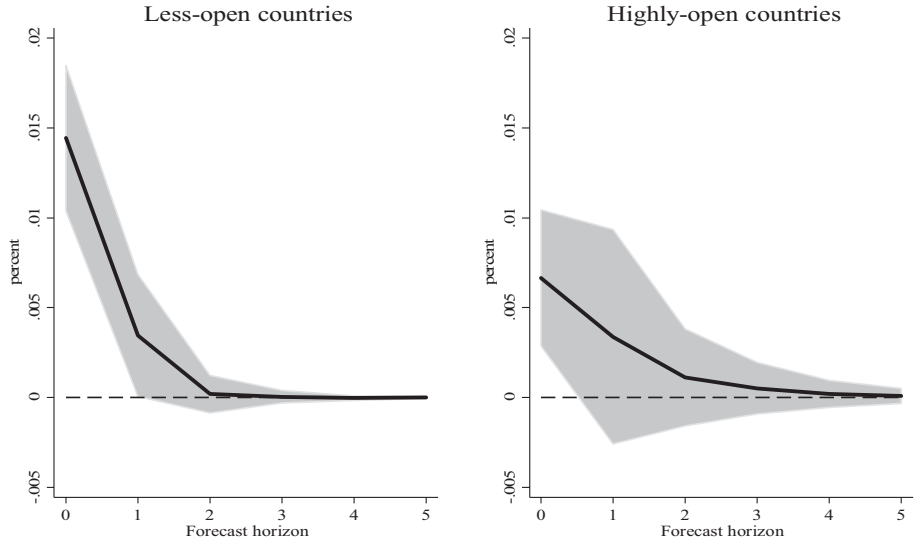

FIGURE 4 Fiscal multipliers and economic openness. *Note*: The solid line displays percentage response, and the shaded areas represent 95% CI by 1000 Monte Carlo simulations. *Source:* Authors' computations.

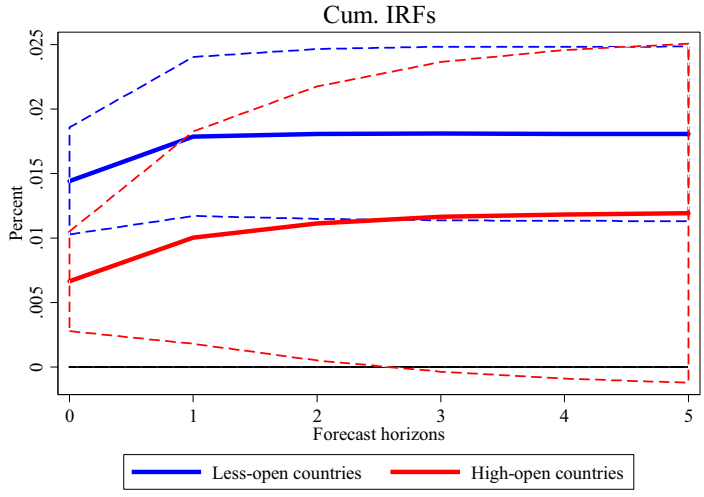

FIGURE 5 Cumulative IRFs under closed and open economies. *Source*: Authors' computations.

regimes is 0.08% impact multiplier and the multiplier is large at all horizons than the flexible exchange regime (Figure 6). This can be explained in an open economy with free capital movement, under a flexible exchange rate regime, interest rate increases and in effect, the domestic currency appreciates to reduce the effect of fiscal expansion. Conversely, under a fixed exchange rate regime, to maintain currency appreciation, the central bank follows an expansionary monetary policy leading to a relatively strong response of output. (Born et al., 2013; Furceri & Li, 2017; Ilzetzki et al., 2013). Our estimates agree with the conclusions reached by (Born et al., 2013; Furceri & Li, 2017; Honda et al., 2020; Ilzetzki et al., 2013; Sheremirov & Spirovska, 2022) but contradict the findings of (Dellas et al., 2005; Koh, 2016; Kraay, 2012; Ravn & Spange, 2014). In this regard, further research is necessary for understanding why the fiscal impulses of exchange rate regimes were found to contradict the literature.

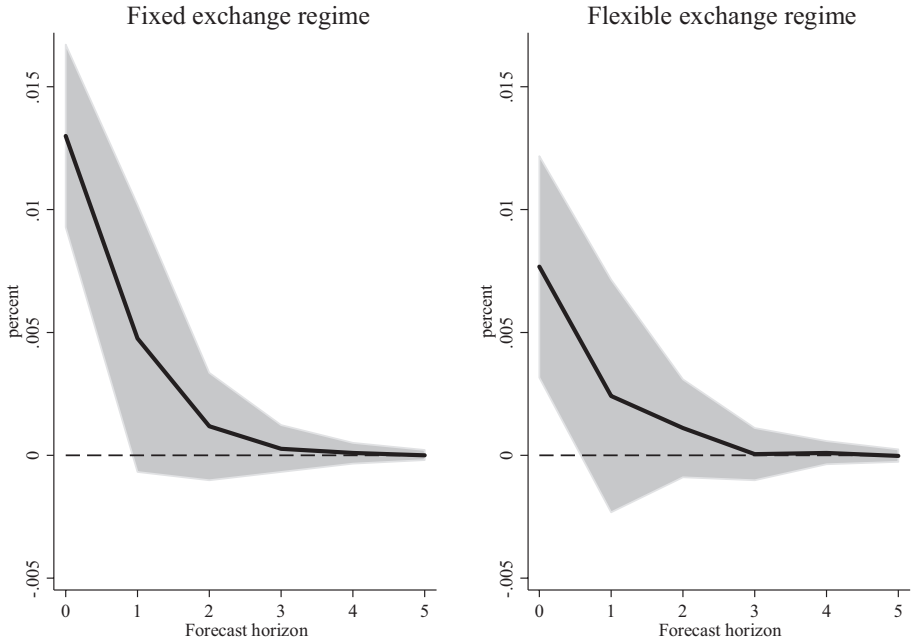

FIGURE 6 Fiscal multiplier under different exchange rate regimes. *Note*: The solid line displays percentage response, and the shaded areas represent 95% CI by 1000 Monte Carlo simulations. *Source*: Authors' computations.

Our cumulative multipliers evidenced that fixed exchange rate regimes tend to induce larger multipliers than floating exchange rate regimes in SSA countries (Figure 7). In the long run, under a fixed exchange regime, the study provides evidence that, on average, a 1% increase in government spending induces output to increase by 0.013% whereas under a floating exchange rate regime, output increase by 0.008%. This reveals that, under fixed exchange rates, monetary policy accommodates the increased demand for the domestic currency to prevent the currency from appreciating and induces private demand without affecting the net export.

4.8 | Fiscal multipliers and international capital mobility

The international capital mobility variable is obtained from Chinn and Ito (2020) based on Chinn–Ito normalised index. The global median is taken as threshold where below or equal to the index median corresponds to lower capital mobility and above the median corresponds to higher capital mobility. In our sample, the size of fiscal multipliers is inversely related on the degree of international capital mobility. A 1% increase in fiscal spending under a lower rate of capital mobility leads to a sizeable increase in output by 0.08% on impact and the response is persistent and positive till fourth year. However, the output response to a contemporaneous unanticipated increase in fiscal spending under higher capital mobility, on impact, is about 0.06% and dissipates then after (Figure 8). Our findings document that when capital movements are less restricted, the potency of fiscal policy increases. However, when capital movement is unrestricted triggers to rise the exchange rate and crowds-out the multiplier effect of fiscal policy (Mora & Acevedo, 2019). Our findings are corroborated by (Mora & Acevedo, 2019). However, Koh (2016) finds contradicting predictions documenting impulse responses in financially open economies are larger as compared to less restricted capital movements for 120 countries.

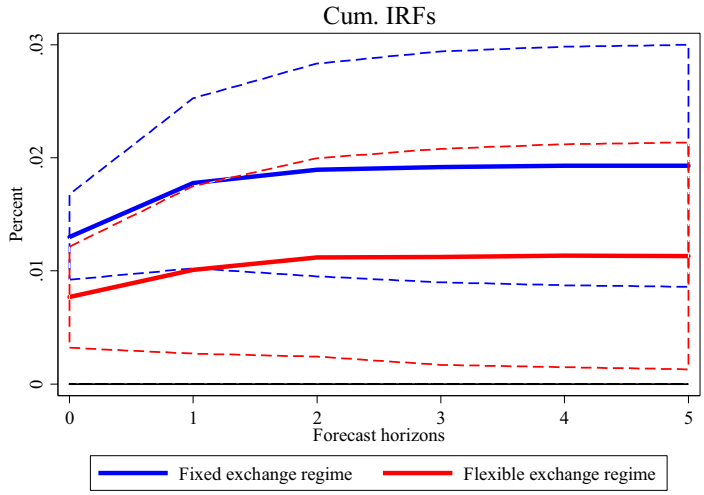

FIGURE 7 Cumulative IRFs under fixed and floating exchange rate regimes. *Source*: Authors' computations.

In the long run, the size of the fiscal multiplier under low capital mobility is around 0.016%, on average for the five-forecast horizon, while the cumulative effect for high capital mobility is around 0.008% on average (see Figure 9). This implies that fiscal expansions are effective in countries with accommodating monetary policy than their counterparts. Our findings are consistent with the predictions of the Mundell–Fleming model.

To sum-up, our findings confirm the size of fiscal multipliers is amplified with the degree of monetary policy accommodation in fixed exchange rate regimes and lower rate of international capital mobility. This underscores the importance of interactions between fiscal and monetary policy. However, the findings of our study contradict with the results of Kraay (2012) and Koh (2016) which opens an interesting avenue for future research, especially in a small open economy context.

4.9 | Fiscal multipliers and financial development

In this study, following the paper of Koh (2016), financial development is measured by domestic credit to private sector (% of GDP) where a less-developed financial system is defined if the share is below or equal to 50 and a higher degree of financial development if the share is greater than 50 % of GDP. In this study, we find that output response to a spending shock varies with the rates of financial development. Figure 10 shows the point estimate *of* output response to the degree of financial development in the short run. On impact, the fiscal multiplier is about 0.08% under less-developed financial systems and 0.06% under high levels of financial development. Our findings indicate that under a well-developed financial system, economic agents have better access of saving to smooth consumption with a lower probability of liquidity constraint. Thus, fiscal expansion has smaller effects on output. Our estimates are consistent with the results of Sedighi et al. (2021) but contradict with the findings of Koh (2016).

The cumulative fiscal multipliers show in countries with low financial development have larger multiplier responses than with higher financial development for all the forecast horizons (Figure 11).

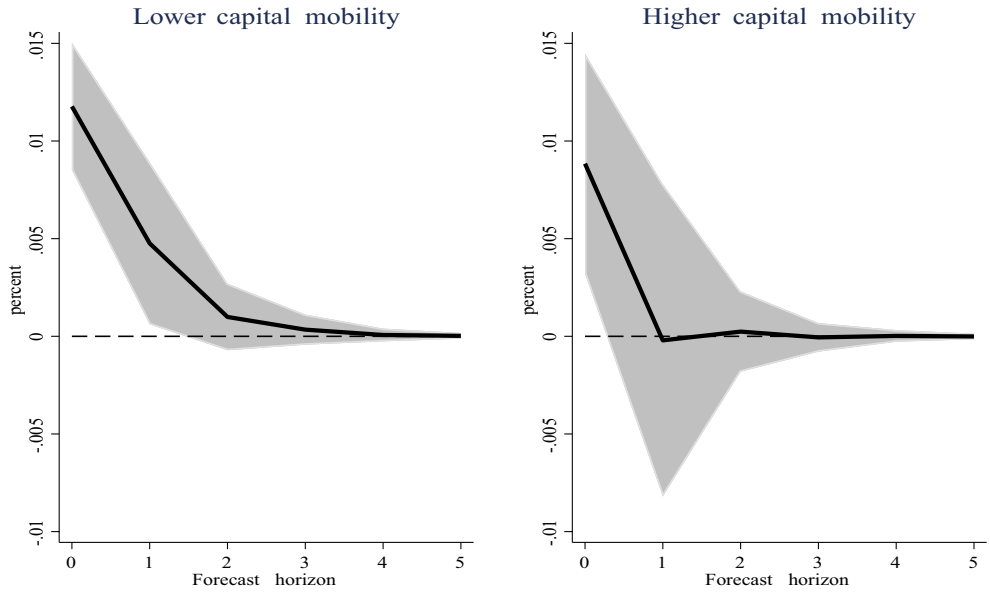

FIGURE 8 Fiscal multipliers and international capital mobility. *Note*: The solid line displays percentage response, and the shaded areas represent 95% CI by 1000 Monte Carlo simulations. *Source*: Authors' computations.

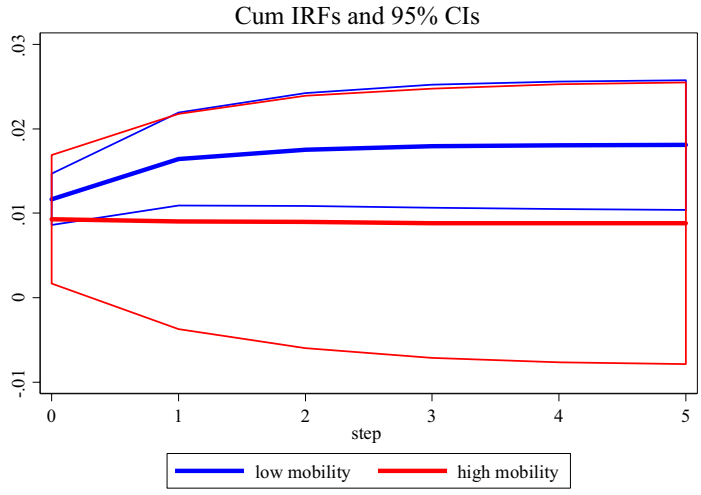

FIGURE 9 Cumulative response of fiscal multipliers under low and high international capital mobility. *Source*: Authors' computations.

4.10 | Fiscal spending shocks and political regimes

This study uses the Polity 2 dataset to split the political regime into democracy versus autocracy. The data range from +10 (full democracy) to −10 (full autocracy) and this study codes the negative score to an authoritarian regime and the positive score to a democrat regime. The fiscal transmission mechanism reveals sizable differences across political regimes (Figure 12). This paper also shows evidence that, under a democratic regime, a 1 LCU increase in government spending shocks, on impact, tends

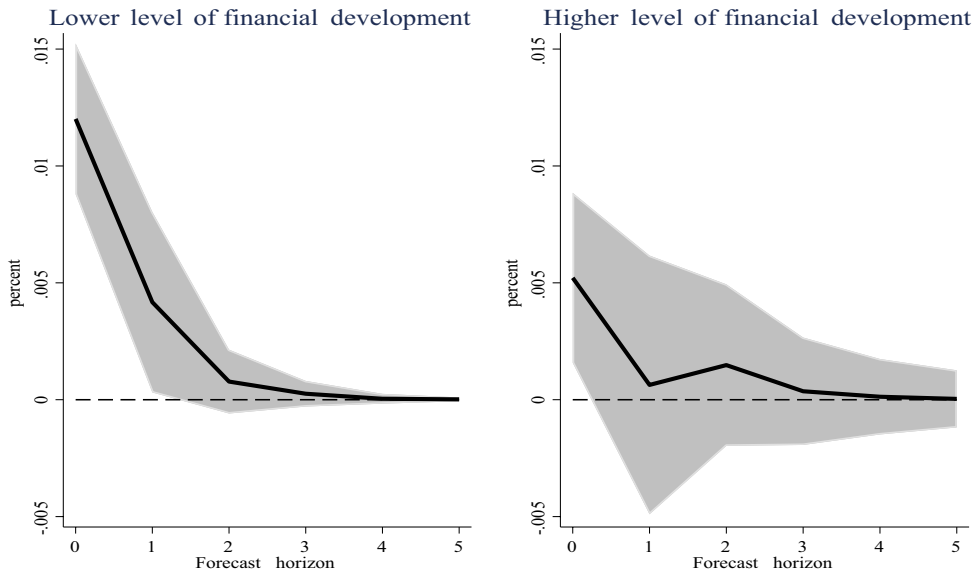

FIGURE 10 Fiscal multipliers and financial development. *Note*: The solid line displays percentage response, and the shaded areas represent 95% CI by 1000 Monte Carlo simulations. *Source*: Authors' computations.

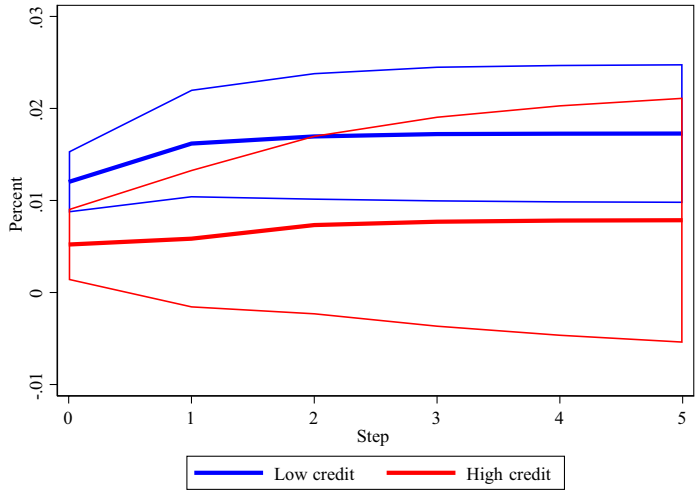

FIGURE 11 Cumulative response of fiscal multipliers under lower and higher financial development. *Source*: Authors' computations.

to increase output by 0.064 local currency unit (LCU) whereas, under an authoritarian regime, it increases output by 0.061 LCU. Autocratic regimes compared to democratic regimes reduce the effect of fiscal multipliers. The possible explanation could be under democratic governance voters and pressure groups can influence politicians to redistribute public resources to social welfare programs the people and political institutions have electoral incentives to spend government resources in public programs which in effect increases the fiscal multiplier. Last but not least, the prolonged civil wars in SSA necessitated immediate military expenditure to respond to close multipliers in the shock period of both regimes (Figure 12). Our results are in line with the analyses of Honda et al. (2020).

Figure 13 demonstrates the cumulative response of output under democratic governance has a larger multiplier in the long run than in autocratic governance countries. The results suggest that the effects of unanticipated fiscal policy innovations would be larger and more persistent in the long run when the political regime is democratic (Figure 13).

In tandem, the findings of this chapter lend theoretical and empirical justifications of previous studies on advanced economies and minimal studies on developing countries regarding the business cycle of an economy; trade openness; debt burden; exchange regime; international capital mobility; financial development and governance regime with small multiplier effects. The reasons can be summarised as follows. First, the variations in the size of the multipliers can mainly rooted from implementing various methodologies and using different identification strategies. Second, it can also be related to the specific characteristics of SSA economies where there are large informal sectors; higher precautionary saving because of instability; inefficient fiscal administration and the economies are small but more open.

4.11 | Robustness checks

Various robustness checks, including per capita values and percentage values of GDP, do not substantially alter the signs and size of the results (Figure A1). Furthermore, cyclically adjusted government revenue was also considered to represent an unadjusted government revenue, confirming that the estimated impulse multipliers are not reverted and do not lead to substantially varied impulse responses (Figure A2). Finally, altering the order of the endogenous variables does not substantially alter the results (Figure A3). Therefore, the robustness checks confirm that the identification of spending shocks seems to be appropriate. Finally, all the panel TVAR estimated models in this paper were

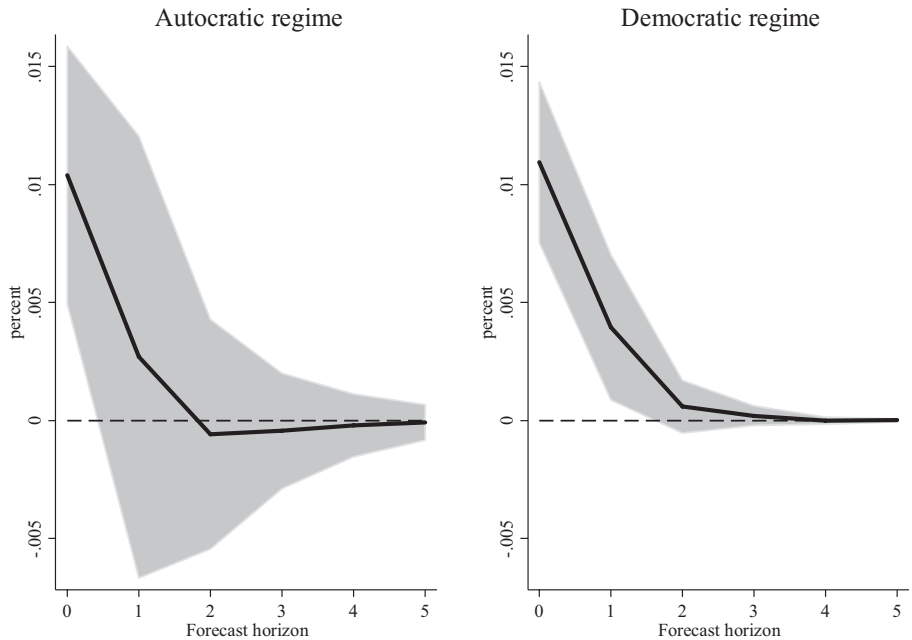

FIGURE 12 Fiscal multipliers and Political regimes. *Note*: The solid line displays percentage response, and the shaded areas represent 95% CI by 1000 Monte Carlo simulations. *Source*: Authors' computations.

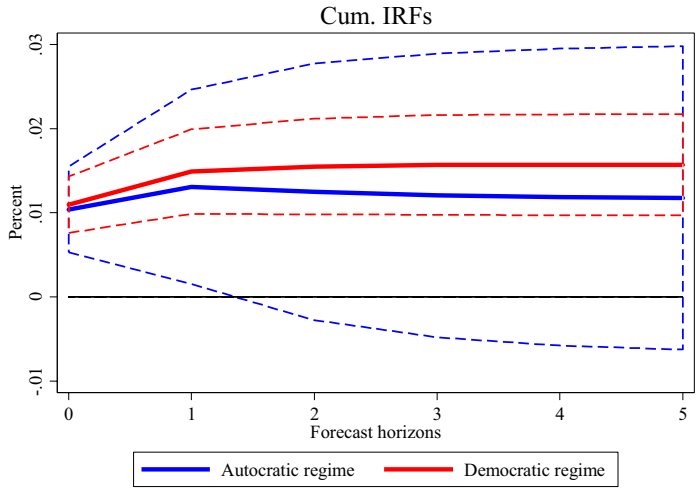

FIGURE 13 Cumulative IRFs under low- and high-quality institutions. *Source*: Authors' computations.

assessed for stability, and the eigenvalues of the roots of the companion matrix lie inside the unit circle, confirming the stability condition.

5 | CONCLUSIONS

This study examined the output response to discretionary fiscal spending shocks under several key characteristics of economies using annual data from 40 SSA countries covering periods from 2000 to 2019. The study applied a panel TVAR model to assess the effects of orthogonal and unanticipated fiscal spending shocks. The results confirm an asymmetry or nonlinear response of output to the discretionary fiscal policy under several structural economic characteristics in SSA economies. The findings suggest that: (1) an unanticipated fiscal policy to output, on impact, has more impulse in periods of recession, 0.09%, than in periods of expansion, 0.024%. (2) On impact, the impact elasticity of fiscal policy shocks to output for highly indebted countries is 0.04%, whereas it is 0.08% for low-indebted countries. (3) As for the asymmetric effect of fiscal stimuli, on impact, the response of output to structural shocks of fiscal spending under a closed economy is 0.09% and 0.04% under an open economy. (4) If fiscal policy increases by 1%, on impact, output increases by 0.05% in economies that practice a floating exchange rate. At the same time, the effect of unanticipated fiscal spending shocks on real GDP growth is small at all horizons, with a 0.08% impact multiplier in economies that practice a fixed exchange rate. (5) The size of fiscal multipliers, on impact, is 0.08% for less international capital mobility countries, and 0.06% for countries with high international capital mobility. Considering the sizable fiscal multipliers under a fixed exchange regime and a lower rate of capital mobility, spending multipliers tend to be larger when monetary policy is accommodative. (6) The size of multipliers tends to be higher for countries with less-developed financial systems than their counterparts. Lastly, an increase in unanticipated government spending leads to an immediate increase in real GDP growth in SSA countries with a democratic political regime. Finally, this study corroborates the Keynesian perspective on fiscal spending shocks, as it finds consistently to the responses of the business cycle of an economy, exchange rate regime, trade openness, debt burden, and governance regime to the announcements of fiscal policy in SSA countries. Moreover, no single fiscal multiplier

can be assigned to a country. Hence, policymakers should act accordingly to cultivate sizable, persistent, and long-lasting effects through fiscal policy. Thus, countercyclical fiscal policy is found to be substantial, and contractionary fiscal adjustment is suggested during times of positive output gaps as opposed to negative output gaps. Moreover, in order to have an effective fiscal policy, policymakers should have to target hand-to-mouth consumers (non-Ricardian consumers) and firms with limited liquidity, concentrating on social services and social protection to increase short-term demand. Likewise, a proper fiscal monetary policy mix should be considered with other structural measures to maximize the positive effects of fiscal expansion. Finally, although the findings of this study are interesting, further research is necessary to analyze the spending shock effect at the disaggregated level, public investment, and public consumption. Second, global shocks such as the COVID-19 pandemic and the conflict in Ukraine are not considered. Further research incorporating these global shocks would add another dimension to policy formulation because these factors significantly impacted fiscal policy.

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DATA AVAILABILITY STATEMENT

This study's dataset was constructed annually, spanning from 2000 to 2018, for 23 SSA countries (Table A1 in the Appendix 1). Our dataset primarily relies upon International Financial Statistics, World Development Indicators, the Polity IV database, Darvas (2020) and Ilzetzki et al. (2017) as data sources (Table 1).

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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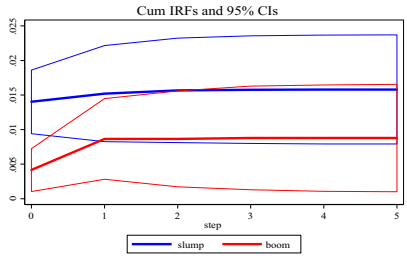
APPENDIX 1

TABLE A1 Summary of empirical literature on determinants and magnitude of fiscal innovations in developing countries.

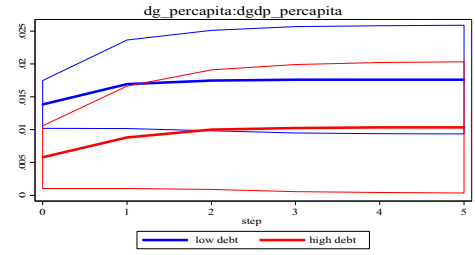
Authors	Countries and data frequency	Methodology	Fiscal multiplier[a]
Ilzetzki et al. (2013)	44 countries (quarterly: 1960:1–2007:4)	SVAR	−0.03
Estevão and Samaké (2013)	77 countries (annual: 1973–2011)	SVECM	0.17
Kraay (2014)	102 developing countries (annual: 1970–2010)	Loans from official creditors	0.48
Contreras and Battelle (2014)	55 countries (quarterly: 1988:1–2010:4)	SVAR	0.39
Koh (2016)	120 countries (annual: 1960–2014)	SVAR with sign restrictions	0.63
Furceri and Li (2017)	79 emerging market and low-income countries	Local projection method using forecast error	0.2
Shen et al. (2018)	27 LICs in Sub-Saharan Africa (SSA) (annual: 2000–2015)	DSGE	0.7
Arizala et al. (2020)	44 Sub-Saharan African countries (annual: 1990–2016)	Local projection method using forecast error	0.7
Honda et al. (2020)	42 LICs (annual: 1995–2017)	Local projection method using forecast error	0.1
Sheremirov and Spirovska (2022)	129 countries (1988–2013)	Local projections method (Jordà, 2005) with an IV approach	0.81
Woldu (2022)	18 SSA countries (2000–2018)	Panel VAR	0.06

[a]The fiscal multiplier here only regards developing countries, excluding advanced and emerging economies.

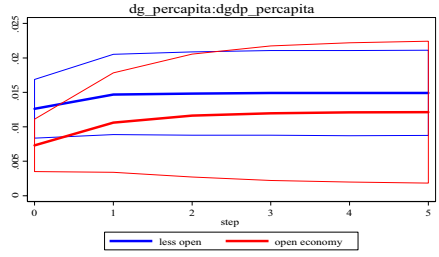
(a) Based on economic cycle



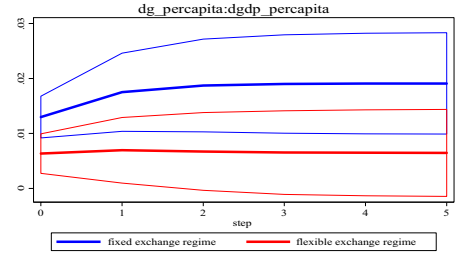
(b) Based on debt burden



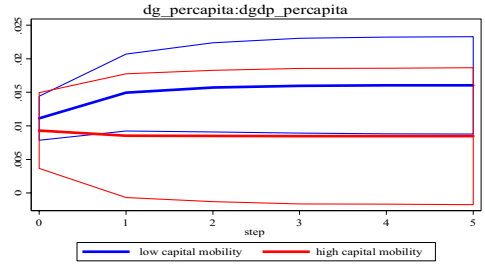
(c) Based on trade openness



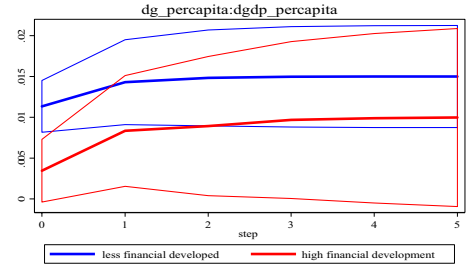
(d) Based on exchange rate regime



(e) Based on capital mobility



(f) Based on financial development



(g) Based on governance regime

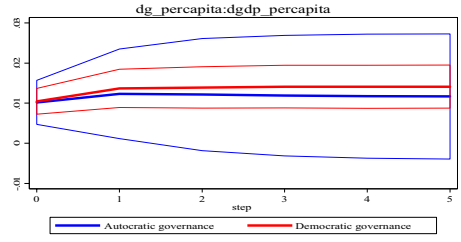
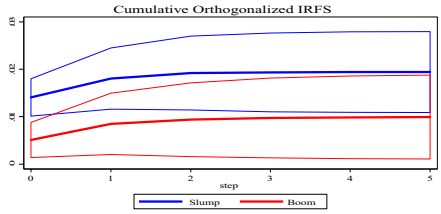
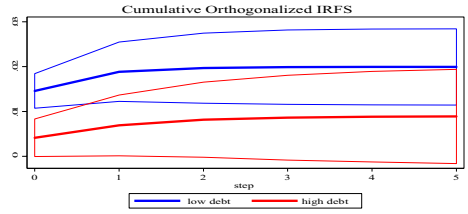


FIGURE A1 Cumulative orthogonalised IRFS by including per capita values and percentage values of GDP. (a) Based on economic cycle, (b) Based on debt burden, (c) Based on trade openness, (d) Based on exchange rate regime, (e) Based on capital mobility, (f) Based on financial development, (g) Based on governance regime.

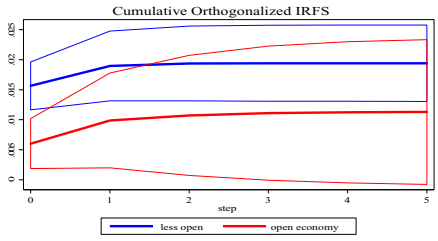
(a) Based on economic cycle



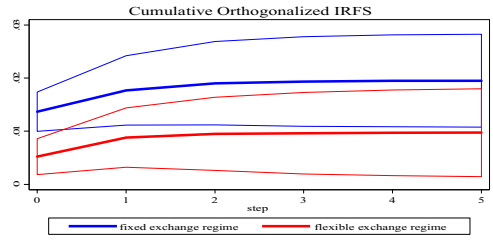
(b) Based on debt burden



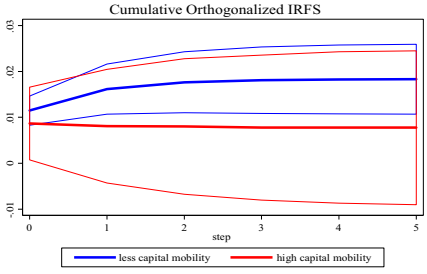
(c) Based on trade openness



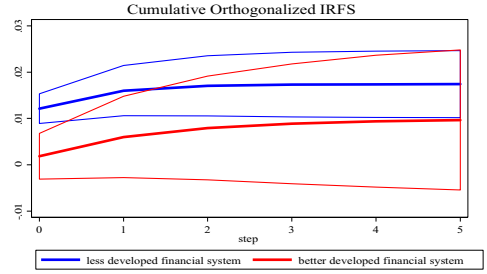
(d) Based on exchange rate regime



(e) Based on capital mobility



(f) Based on financial development



(g) Based on governance regime

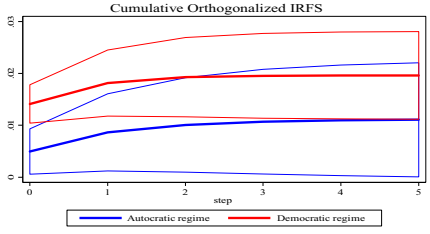
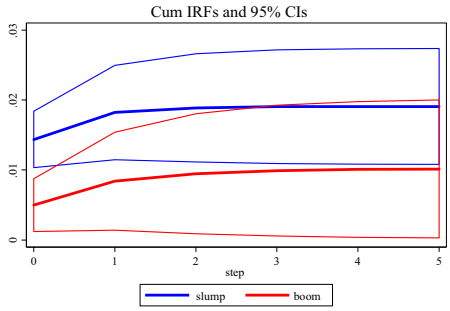
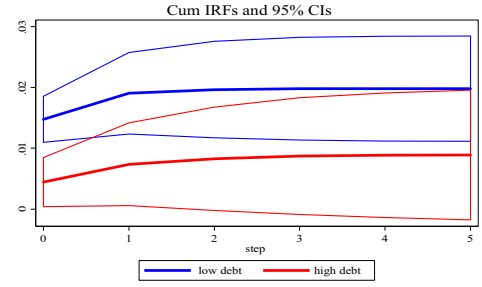


FIGURE A2 Cumulative orthogonalised IRFS by considering the cyclically adjusted government revenue (a) Based on economic cycle, (b) Based on debt burden, (c) Based on trade openness, (d) Based on exchange rate regime, (e) Based on capital mobility, (f) Based on financial development, (g) Based on governance regime.

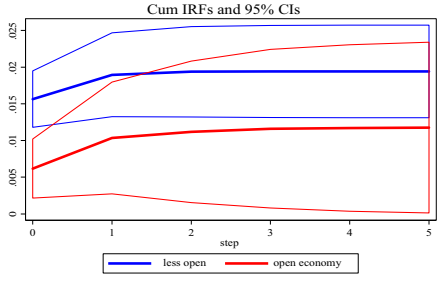
(a) Based on economic cycle



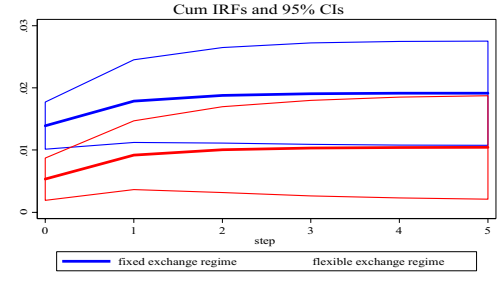
(b) Based on debt burden



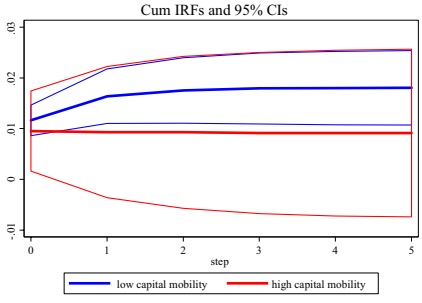
(c) Based on trade openness



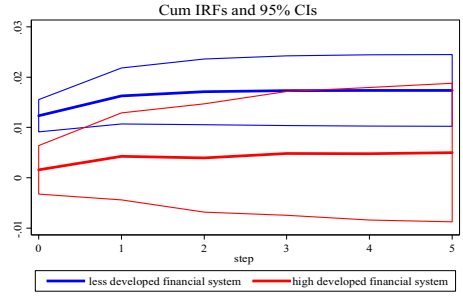
(d) Based on exchange rate regime



(e) Based on capital mobility



(f) Based on financial development



(g) Based on governance regime

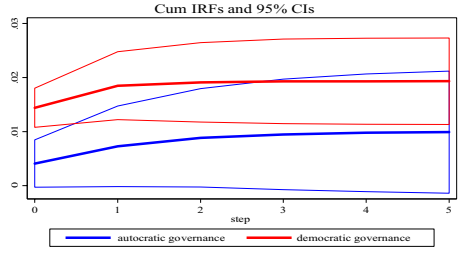


FIGURE A3 Cumulative orthogonalised IRFS by altering the order of the endogenous variables [Δspending, Δrevenue, Δgdp, ΔCABGDP, Δreer]. (a) Based on economic cycle, (b) Based on debt burden, (c) Based on trade openness, (d) Based on exchange rate regime, (e) Based on capital mobility, (f) Based on financial development, (g) Based on governance regime.