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How Robust Is the Link Between Growth and Fiscal Consolidations Amid Uncertainties? A Reassessment for Sub-Saharan Africa

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Abstract
We revisit the relationship between fiscal tightening and economic growth within the Sub-Saharan African context, employing a local projection framework augmented with instruments. In contrast to the conclusions reached by Badru et al. (2025), our findings highlights that fiscal consolidation triggers the growth-depressing effect, independent of the estimation technique used. This contractionary impact intensifies under heightened global uncertainty – whether gauged through geopolitical tension metrics or economic policy unpredictability measures.

Keywords: Fiscal consolidation; Economic growth; Local projection; Sub-Saharan Africa
JEL:

1. Introduction

We investigate the relationship between fiscal consolidation (FC) and economic growth in Sub-Saharan Africa (SSA), contributing to an understudied dimension of macro-fiscal policy in developing economies. Our analysis builds upon and critically extends the findings of Badru et al. (2025) and Woldu and Szakálné Kanó (2023), who presented results regarding the growth-expanding effects of FC. These conflicting narratives underscore the need for a more robust empirical reassessment through a bias correction induced by endogeneity. Our FC, proxied by action-based fiscal shocks, delineates the economic growth-depressing effect of FC in SSA countries.

The IMF (2017) illustrated that achieving long-term fiscal sustainability and rebuilding fiscal buffers is now a global imperative. Yet the rapid accumulation of sovereign debt has emerged as a critical policy challenge globally in the post-pandemic era. Unlike their high-income counterparts, SSA countries typically operate within structurally constrained macroeconomic environments (Bhorat et al., 2017). Worsley, in many SSA countries, the pandemic-induced fiscal expansions – characterized by emergency social spending and stimulus measures – have led to unsustainable debt trajectories (Kose et al., 2021). These include limited access to international capital markets, shallow domestic financial systems, procyclical fiscal policies, and reliance on commodity revenues – all of which exacerbate fiscal vulnerabilities (Chang et al., 2015). Also, actively managed exchange rates and incomplete market liberalization reduce the effectiveness of automatic stabilizers and constrain the countercyclical role of fiscal policy. For example, Akitoby et al. (2006) noted that the procyclical nature of fiscal policy in many low-income countries undermines automatic stabilizers and exacerbates macroeconomic volatility. These conditions amplify the real effects of fiscal tightening and curtail government's ability to sequence and tailor consolidation episodes in growth-friendly ways.

FC means a set of deliberate policy actions – typically involving reduced public expenditure or increased taxation – aimed at stabilizing the government's primary balance and curbing public debt accumulation. It is a policy response frequently employed by governments following prolonged fiscal expansion or unsustainable debt trajectories. Overall, FC is posited to foster beneficial effects on private economic agents. Consolidation can reduce interest rates by lowering sovereign borrowing needs, catalyzing private investment through crowding-in mechanisms, enhancing household expectations of lower future taxes, and bolstering consumers' perceived long-term wealth.

At the policy level, FC signals a government's commitment to macroeconomic prudence and long-term budgetary discipline. However, the timing and circumstances under which these adjustments should be undertaken remain contested. Barrios et al. (2010) stated that fiscal corrections are most appropriate in periods marked by large fiscal imbalances. Instead, von Hagen and Strauch (2001) suggested that economic upturns provide the optimal backdrop for such interventions. Romer and Romer (2010) and Alesina and Ardagna (2013) showed that historical macroeconomic performance is more influential in prompting fiscal adjustments than contemporaneous economic conditions. The macroeconomic consequences of FC has bifurcated into two major schools of thought. The first, rooted in Keynesian theory, views fiscal tightening – whether through spending cuts or tax hikes – as detrimental to short-run aggregate demand. This perspective suggests that when economic output lags behind capacity and households are liquidity-constrained, fiscal restraint undermines consumption and investment, thus suppressing overall economic activity (Afonso et al., 2022). Proponents of this view identify fiscal contraction as contractionary austerity.

In contrast, the expansionary austerity hypothesis challenges the idea that fiscal adjustment can yield positive growth effects under certain conditions. On the demand side, modest tax increases today may avert more severe and abrupt FCs in the future, thereby improving

consumer and investor confidence. If agents anticipate lower future taxes, they may respond by increasing consumption and investment today. Moreover, credible fiscal reform can reduce sovereign risk, lowering real interest rates and stimulating private sector activity (Alberola and Sousa, 2017; Westcott and McDermott, 1996). On the supply side, fiscal tightening through wage reductions in the public sector can exert downward pressure on private sector wages, indirectly boosting competitiveness and productivity.

Nonetheless, the effectiveness of FC shocks in low-income and developing countries, particularly in SSA, remains debatable. Arizala et al. (2021) highlighted that the underdeveloped financial infrastructure and widespread informality in these economies often limit the expansionary potential of austerity. In such contexts, fiscal tightening can inadvertently raise domestic interest rates, stifling private investment and diminishing overall output responsiveness. Therefore, evaluating whether SSA countries benefit more from contractionary or expansionary austerity remains a vital empirical and policy-oriented question. Yet empirical studies on the growth implications of FC in SSA remain sparse. Scholars focus on advanced economies, where institutional quality, financial depth, and policy credibility differ significantly (Coenen et al., 2008; Stähler and Thomas, 2012). As a result, applying lessons from these contexts to SSA can lead to misleading policy conclusions. The empirical query related to SSA nations remains scant. Yabré and Semedo (2021), for instance, explored the implications of political stability for FC efforts across SSA nations, revealing that political steadiness tends to facilitate such fiscal adjustments. Arizala et al. (2021) discussed how output in SSA economies reacts in the short term to shifts in FC, finding that tighter fiscal measures are typically accompanied by reduced economic momentum.

We advance the existing discourse in several essential ways. We employ a local projection framework with instrumental variables (IV-LP), estimated via a two-stage least squares (2SLS) approach. Prior analyses (Badru et al., 2025; Woldu and Szakálné Kanó, 2023) overlooked a key issue: the causal relationship between FC and economic growth is deeply endogenous. Growth fluctuations can prompt fiscal tightening, while unobserved factors like institutional quality or external shocks may jointly affect both outcomes, as Guajardo et al. (2014) highlighted. Measurement errors in conventional deficit-based indicators further complicate identification (Pescatori et al., 2011), and anticipatory behavior regarding fiscal changes can influence current economic performance (Blanchard and Leigh, 2013).

Furthermore, standard deficit-based consolidation measures are plagued by measurement error, and forward-looking expectations about fiscal policy can simultaneously shape growth trajectories (Ramey, 2011). Moreover, these existing works neglect the moderating role of global uncertainties, particularly geopolitical and policy-related uncertainties, which are especially salient in SSA. In this region, fragile governance structures, reliance on foreign aid, and narrow fiscal space intensify the contractionary impacts of FC during periods of heightened global volatility.

Our analysis is structured as follows: Section 2 details the methodology. Section 3 reports the results of baseline and mechanism analyses. Section 4 presents the conclusions.

2. Methodology

2.1 Model setup

We adopt the LP devised by Jordà (2005) to capture the responsiveness of economic growth to FC shocks, with the impulse response function denoted as follows:

$$y_{t+h} - y_{t-1} = \alpha_i^h + \beta^h FC_t + \gamma_i^h \sum_{i=1}^{k} z_{t-i} + v_t^h + \varepsilon_{i,t+h}, for\ h = 1, \dots, m \qquad (1)$$

where y_t is the economic growth at year t; a_i and v_t represent the country- and year-fixed effects, respectively; FC_t is the fiscal consolidation shocks, where β^h captures the impulse response over projected horizon h; z_t denotes covariates, including lags of both shocks plus y_t; ε_t is an error term. Suggested by Klein (2017), a state-dependent LP method is adopted:

$$y_{t+h} - y_{t-1} = \alpha_i^h + S_{t-1}\left[\beta_p^h FC_t + \gamma_i^h \sum_{i=1}^{k} z_{t-i}\right] + (1 - S_{t-1})\left[\alpha_i^h + \beta_q^h FC_t + \gamma_i^h \sum_{i=1}^{k} z_{t-i}\right] + v_t^h + \varepsilon_{i,t+h} \quad (2)$$

where St is an indicator distinguishing between economic regimes, i.e., p and q, with β_q and β_p representing the corresponding impulse responses estimated for each regime.

To characterize how GPR interacts with FC impacting economic growth in SSA nations, Eq. (2) is further extended as follows:

$$y_{t+h} - y_{t-1} = \alpha_i^h + S_{t-1}\left[\beta_p^h FC_t + \phi_p^h GPR_t + \delta_p^h (FC_t \times GPR_t) + \gamma_i^h \sum_{i=1}^{k} z_{t-i}\right] + (1 - S_{t-1})\left[\alpha_i^h + \beta_q^h FC_t + \phi_q^h GPR_t + \delta_q^h (FC_t \times GPR_t) + \gamma_i^h \sum_{i=1}^{k} z_{t-i}\right] + v_t^h + \varepsilon_{i,t+h} \quad (3)$$

where GPR_t is the GPR index at year t; $FC_t \times GPR_t$ captures how the effect of financial conditions depends on the level of geopolitical instability on economic growth. Others align with Eq. (2).

2.2 Variables and data

FC has been well developed in the OECD nations, i.e., Guajardo et al. (2014). However, the same methodology proposed by Guajardo et al. (2014) remains challenging in SSA because of data unavailability. To facilitate a comparative analysis, an auction-based method for FC computation is adopted (Badru et al., 2025). We characterize FC events as periods marked by deliberate fiscal adjustments meeting one or more of the following criteria: a minimum one percentage point rise in the primary balance ratio (%GDP), an increase of at least 0.5 percentage points in government revenues ratio (%GDP), or a reduction of no less than 0.5 percentage points in government expenditures relative to GDP. Following Baldacci et al. (2015), these adjustments are deemed effective only when they are concomitant with a reduction in the government debt-to-GDP ratio. We construct a binary FC dummy, assuming a value of one if any of the outlined thresholds are met in each period and zero otherwise. This identification strategy ensures that only deliberate policy efforts to improve fiscal sustainability by lowering public debt burdens are included in our analysis.

Per capita GDP (log-transformed) multiplied by 100 is an outcome variable in Eq. (1). Simultaneously, covariates including inflation, population (log-transformed), and trade activities are included as exogenous controls to accommodate potential influences impacting economic growth. Besides, LP compromises two lags of all selected indicators for benchmark estimates.

We employ the geopolitical risk (GPR) index developed by Caldara and Iacoviello (2022) and economic policy uncertainty (EPU) index to validate how uncertainty fluctuates the nexus

between FC and economic growth in SSA. We distinguish between elevated and subdued uncertainty periods by referencing the 25th percentile threshold of the index's distribution. Specifically, observations with GPR and EPU values exceeding this threshold are classified as high-uncertainty periods, while those falling below are treated as low episodes.

Our sample includes 37 SSA nations from 1990 to 2021. Our raw data is sourced from Müller et al. (2025) and the World Bank database, with 2015 US dollars as the benchmark for all monetary indicators. We construct a balanced panel dataset by completing variables with minimal missing values through linear extrapolation. The GPR and EPU indices are extracted from Caldara and Iacoviello (2022) and Economic Policy Uncertainty Index Website [1], respectively. Due to data limitations specific to the region, we rely on the global GPR and EPU measures to evaluate how uncertainty conditions the relationship between FC and economic growth across SSA economies. Notably, macroeconomic indicators frequently display persistent directional movement over time, i.e., GDP. In time-series terminology, such behavior is typically characterized by a unit root, indicating that these variables are integrated of order one, or I(1). When expressed in logarithmic terms, their first differences offer a close approximation of percentage changes, capturing the dynamics of GDP growth (Jordà, 2023).

3. Results

3.1 Fiscal consolidation versus economic growth

We display unadjusted and refined impulse response trajectories generated via a state-contingent LP framework to enable a robust examination. The refined estimates incorporate two pivotal modifications: (1) all macroeconomic indicators are filtered using the Hodrick-Prescott (HP) procedure to extract their cyclical components, thereby eliminating automatic fiscal responses and isolating discretionary interventions; and (2) estimation is performed through an instrumented LP setup, which contrasts to the approach adopted by Badru et al. (2025).

As visualized in Fig. 1, panels (a) and (b) depict outcomes under the narrative and adjusted scenarios, respectively. The divergence in results is stark – while the narrative approach suggests a positive response of economic output in SSA to FC shocks, with an accumulative response magnitude approximating 1.76, this finding closely echoes those reported in Badru et al. (2025), highlighting the role of action-based fiscal interventions in stimulating regional growth.

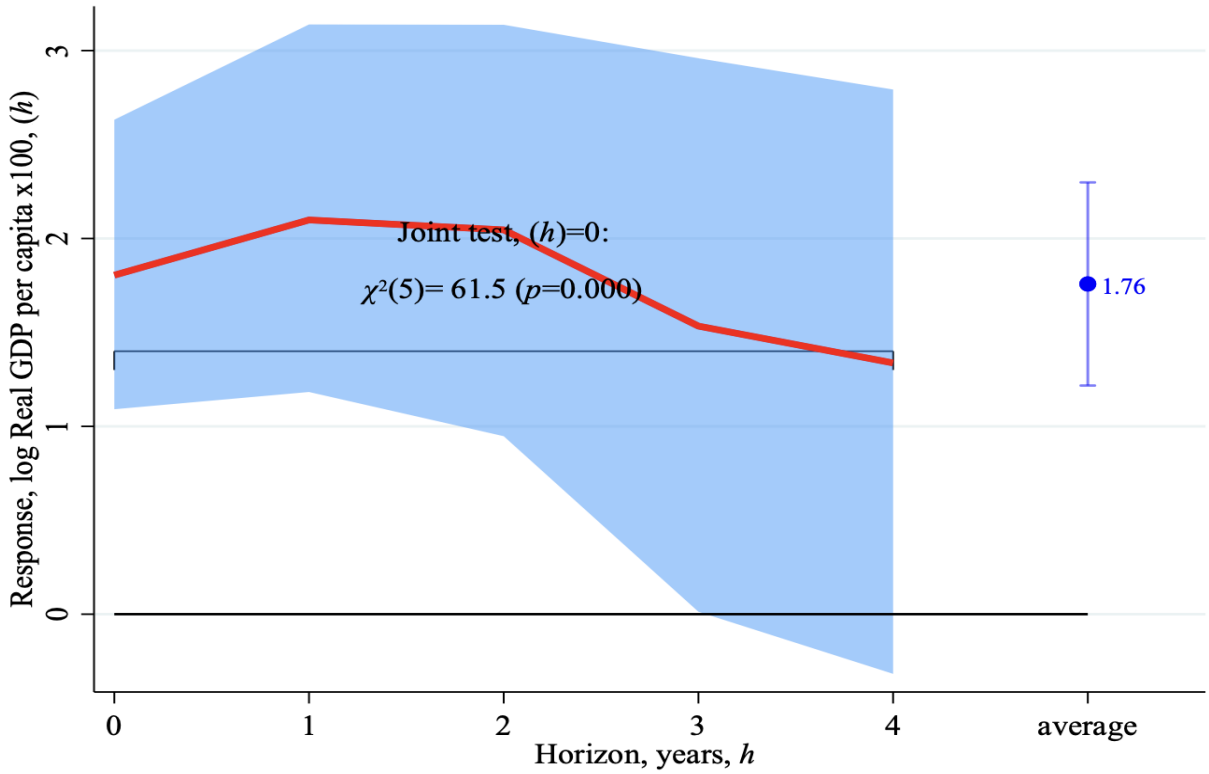
Following Guajardo et al. (2014), we recalibrate the narrative specification using instrumental variables. Specifically, Eq. (1) is estimated through 2SLS, wherein our constructed series of fiscal shocks serves as an instrument for the variation in the cyclically adjusted primary balance (CAPB). The first-stage regression links changes in the CAPB to the identified fiscal shocks, while the second-stage regression examines how these instrumented CAPB changes affect measures of real economic performance[2]. This IV-LP approach directly addresses the endogeneity bias often present in fiscal-growth relationships.

After addressing potential endogeneity, the adjusted response trajectory in Fig. 1 (b) reveals a markedly adverse cumulative effect, reaching -31.75. Moreover, the associated χ^2 test strongly rejects the hypothesis of uniform responses across time, indicating statistically significant heterogeneity in impulse responses. Notably, the estimated coefficients suggest that

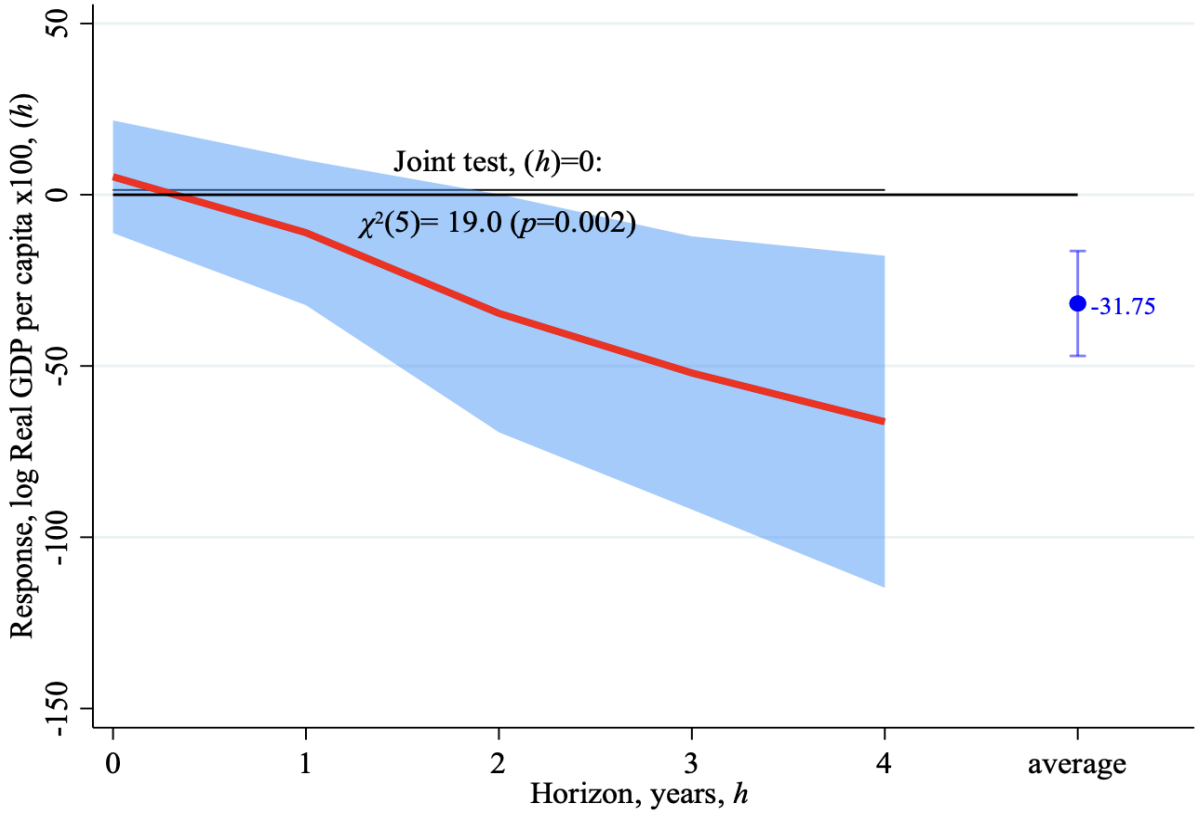
[1] See https://www.policyuncertainty.com/.

[2] The change in CAPB isolates the exogenous variation in fiscal policy that is independent of short-run economic fluctuations. We regress economic growth on the instrumented values of CAPB changes in the subsequent stage – effectively using the narrative fiscal shocks as a valid instrument. Because these shocks are unrelated to contemporaneous growth conditions, they satisfy the exclusion restriction, ensuring that the only channel through which they affect growth is via changes in fiscal policy. Specifically, since the shocks are unrelated to contemporaneous economic trends, they are unlikely to influence growth through any channel other than fiscal policy itself.

as discretionary fiscal tightening intensifies, the adverse impact on economic growth in SSA becomes progressively more pronounced over the forecast horizon.



(a) Narrative specification.



(b) Adjusted specification.

Fig. 1. Impact of fiscal consolidation shock on the real per capita GDP.

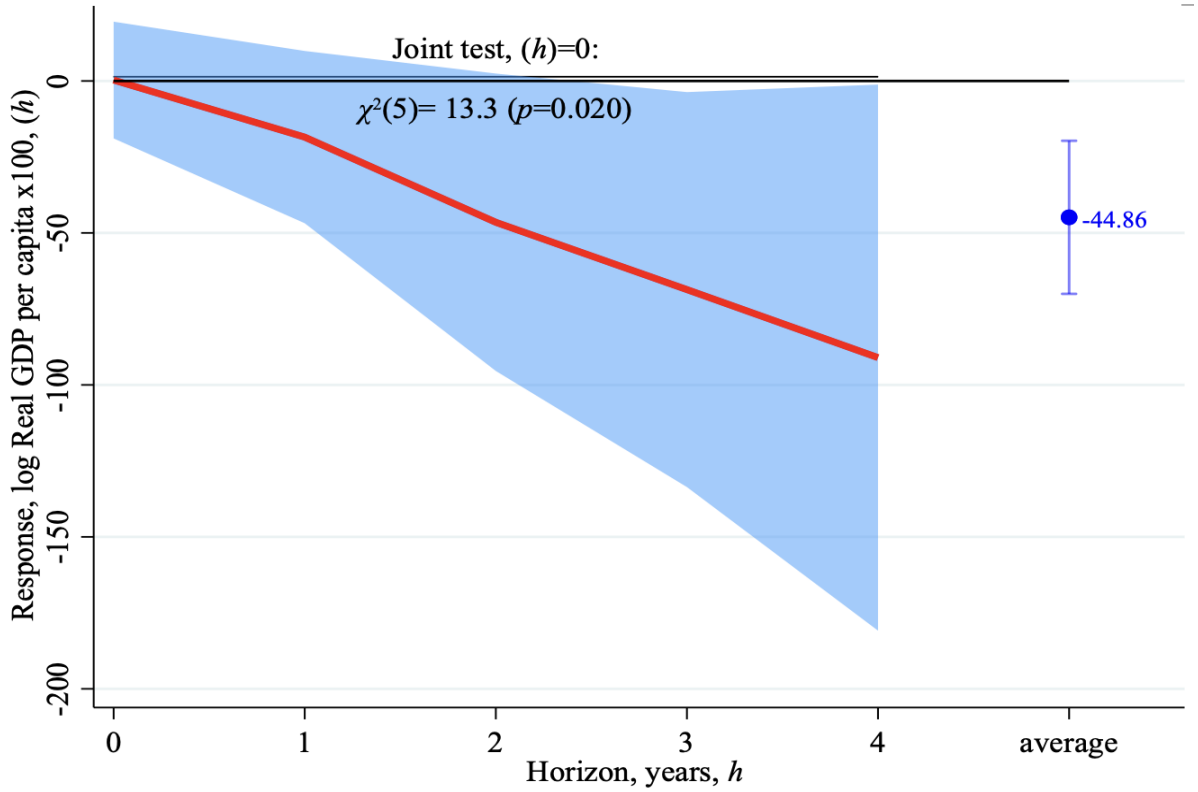
Notes: Fig. 1 presents the results derived from an IV-LP framework (i.e., two lags), where the log of GDP per capita is the outcome variable, and FC shocks are the principal explanatory indicator. Standard errors are computed using clustering at the country level. The joint significance of coefficients across various forecast horizons h is assessed using a χ^2 test, with the corresponding p-value in each subplot indicating statistical relevance. The coefficients in Fig. 1 reflect the average dynamic response of GDP per capita to FC shocks over time.

The stark contrast between the naïve narrative and the IV-adjusted impulse response estimates underscores the critical importance of addressing endogeneity in evaluating the macroeconomic effects of FC in SSA. The initial positive response in the narrative specification aligns with surface-level interpretations commonly found in action-based fiscal datasets, as echoed in Badru et al. (2025). However, this alignment may be misleading due to omitted variable bias or reverse causality; Ramey (2011) demonstrated that policy announcements often coincide with anticipated economic downturns, thereby inflating perceived fiscal multipliers when using narrative approaches alone.

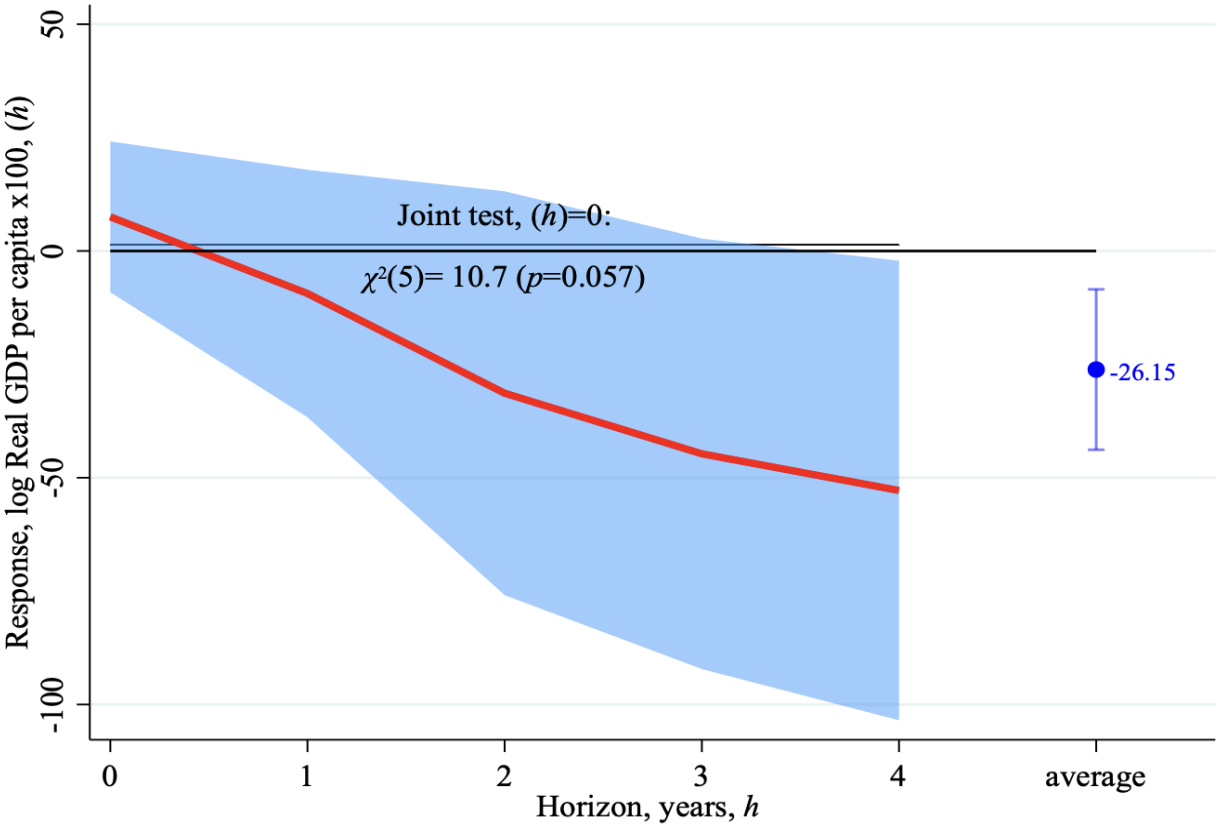
The implementation of an IV-LP estimation corrects for this simultaneity problem. Our finding resonates with the theoretical insights from Alesina et al. (2019), who argued that the macroeconomic consequences of austerity depend heavily on the composition and timing of fiscal adjustments. In resource-constrained and institutionally weaker economies like SSA, consolidation measures – especially those that reduce government investment – tend to have contractionary effects due to their crowding-in limitations and lack of monetary offset mechanisms. Guajardo et al. (2014) further completed that when fiscal shocks are identified through changes in CAPB rather than narrative measures, the resulting multipliers are more negative, particularly in economies with rigid exchange rate regimes or limited monetary autonomy – characteristics that typify many SSA countries.

3.2 Robustness tests

To assess the extent to which the choice of lag structure influences the impact of financial development on economic growth, we re-estimate the model under two distinct lag configurations: a one (a) and three (b) lags, as plotted in Fig. 2. In both cases, the cumulative impulse response coefficients remain negative, registering values of -44.86 and -26.15, respectively. Moreover, the χ^2 test statistics continue to support the presence of response heterogeneity across different time horizons. These findings confirm that the estimated effects are robust to variations in lag length specification.



(a) Estimation based on one lag.



(a) Estimation based on three lags.

Fig. 2. Impact of fiscal consolidation on the real per capita GDP.

Notes: Fig. 2 presents the results derived from an IV-LP framework (i.e., three lags), where the log of GDP per capita is the outcome variable, and FC shocks are the principal explanatory

indicator. Standard errors are computed using clustering at the country level. The joint significance of coefficients across various forecast horizons h is assessed using a χ^2 test, with the corresponding p-value in each subplot indicating statistical relevance. The coefficients in Fig. 2 reflect the average dynamic response of GDP per capita to FC shocks over time.

While per capita GDP offers a clearer picture of average living standards and individual economic well-being, aggregate GDP more effectively represents the scale effect, capturing expansionary dynamics and overall resource demands. Accordingly, we substitute per capita GDP with national GDP in our subsequent analysis, as illustrated in Fig. 3. Notably, this adjustment yields an identical cumulative impulse response, maintaining the estimated value of -34.07 previously observed with per capita GDP in Fig. 1.

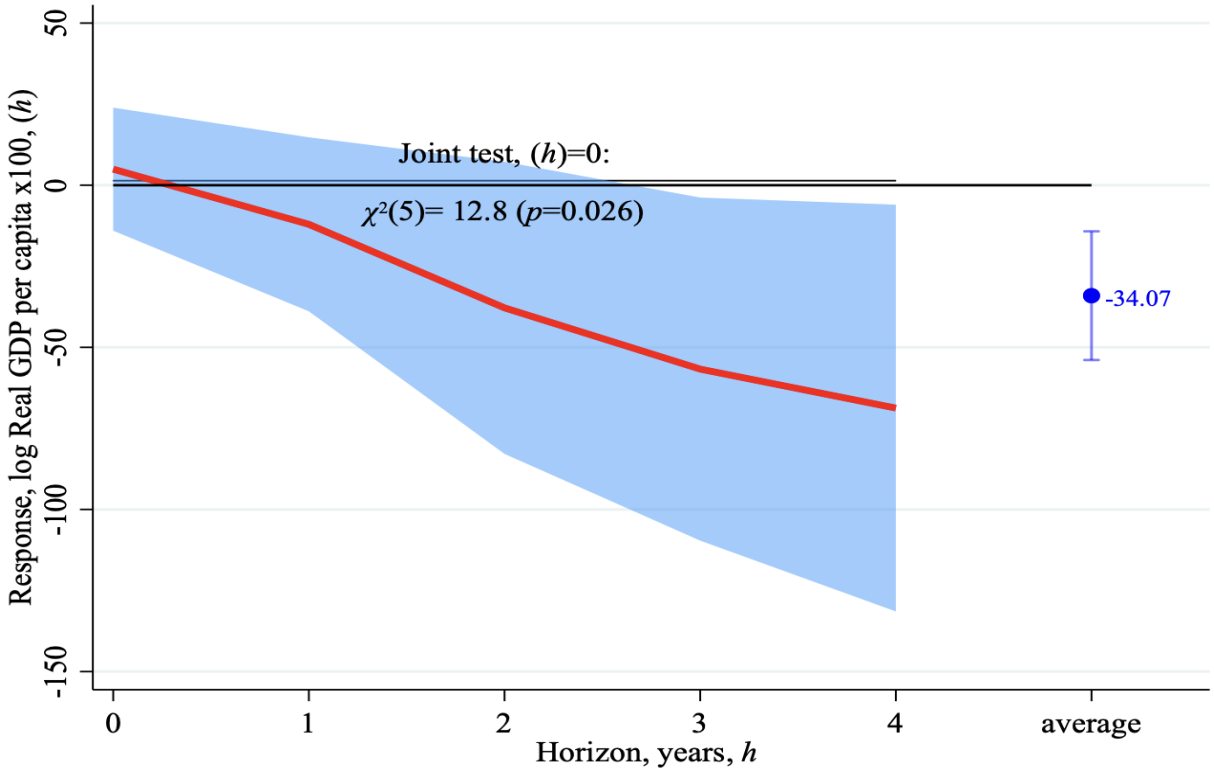
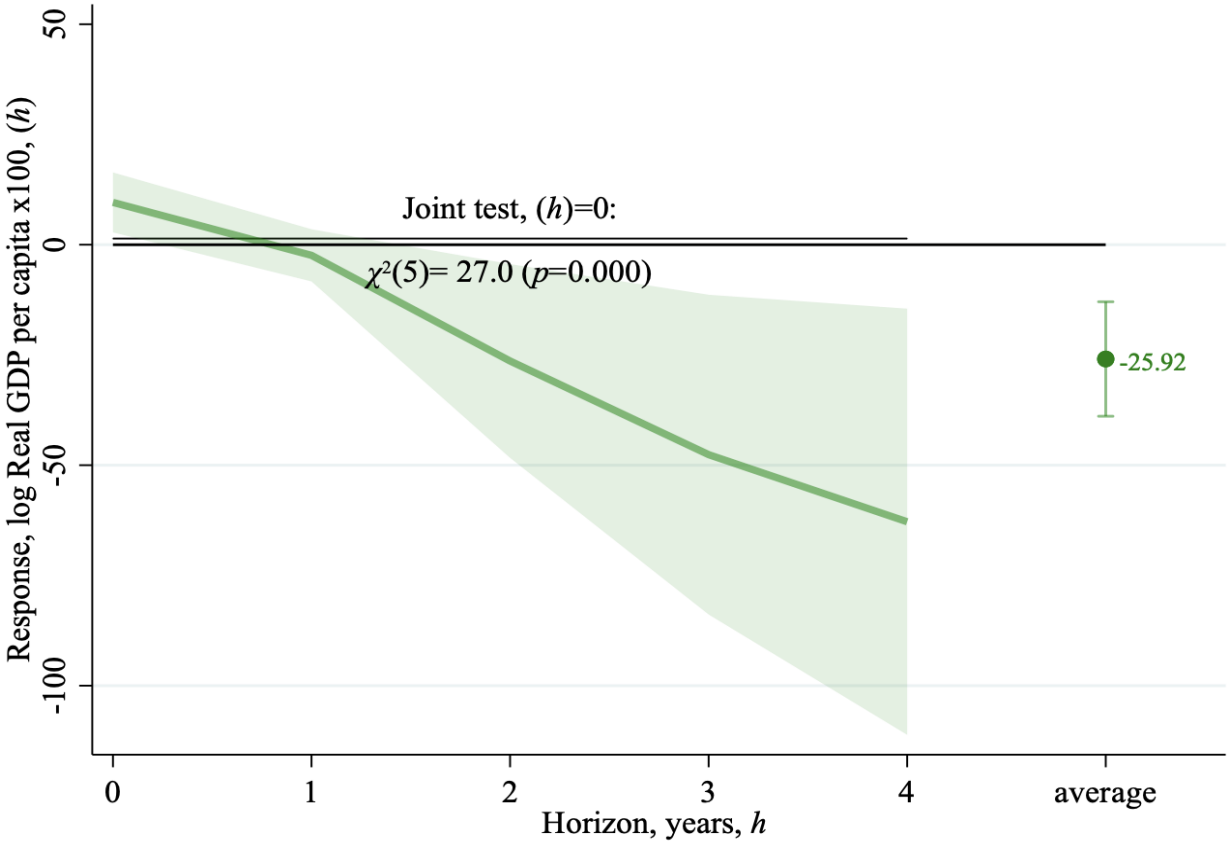


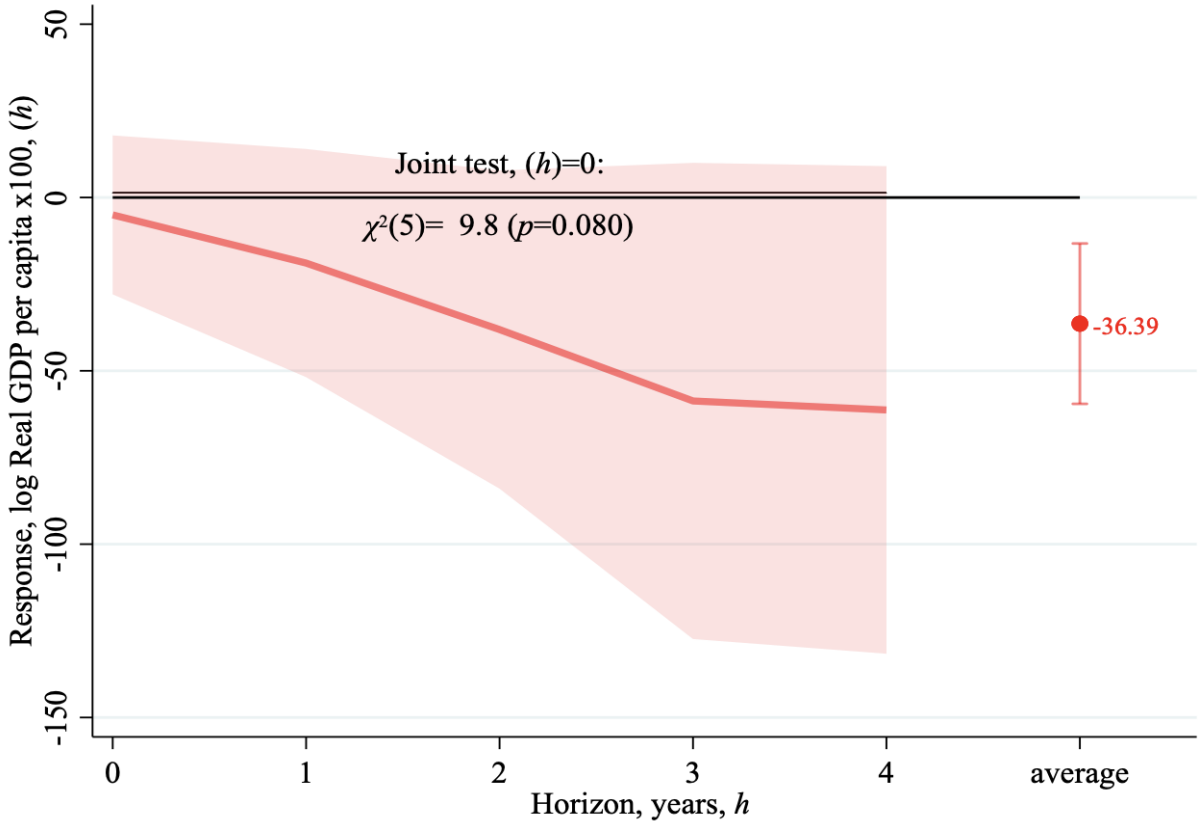
Fig. 3. Impact of fiscal consolidation on real GDP.
Notes: Fig. 3 presents the results derived from an IV-LP framework (i.e., two lags), where the log of GDP is the outcome variable, and FC shocks are the principal explanatory indicator. Standard errors are computed using clustering at the country level. The joint significance of coefficients across various forecast horizons h is assessed using a χ^2 test, with the corresponding p-value in each subplot indicating statistical relevance. The coefficients in Fig. 3 reflect the average dynamic response of GDP to FC shocks over time.

To illustrate how state-dependent analysis might be operationalized, consider defining a binary variable D_{t-r} that captures the economic condition at $t - r$, where $r > 0$ denotes a lead time before policy implementation. If this economic condition is identified in advance and remains uninfluenced by the policy action, as if assigned randomly, then this setup approximates an exogenous framework. Importantly, LPs are designed to circumvent the need for simulated counterfactuals. By conditioning on the current state and relevant controls, LPs estimate the expected dynamic response of the economy, averaging across all conceivable future paths, including those involving subsequent regime changes. The variable D_{t-r} is a stratification indicator, assigned a value of one during economic expansions and zero during

downturns. These phases are identified based on whether the cyclical deviation of output from its trend, obtained through HP filtering, is above or below zero. A crucial identifying assumption underpinning the analysis is that FC shocks occur independently of the prevailing state of the business cycle. The individual slump response is subject to considerable uncertainty; however, greater clarity emerges upon examining the average effect, which amounts to -25.92 in booms and -36.39 in slumps, respectively. The finding implies that economic shocks have more severe effects during slumps than in booms. Nonetheless, our baseline estimates remain robust regardless of which methods are unpacked. **Appendix A** details the multiplier effects.



(a) Boom episodes, i.e., $boom_{t-1} = 1$.



(b) Slump episodes, i.e., $slump_{t-1} = 1$.

Fig. 4. Impact of fiscal consolidation on real per capita GDP.

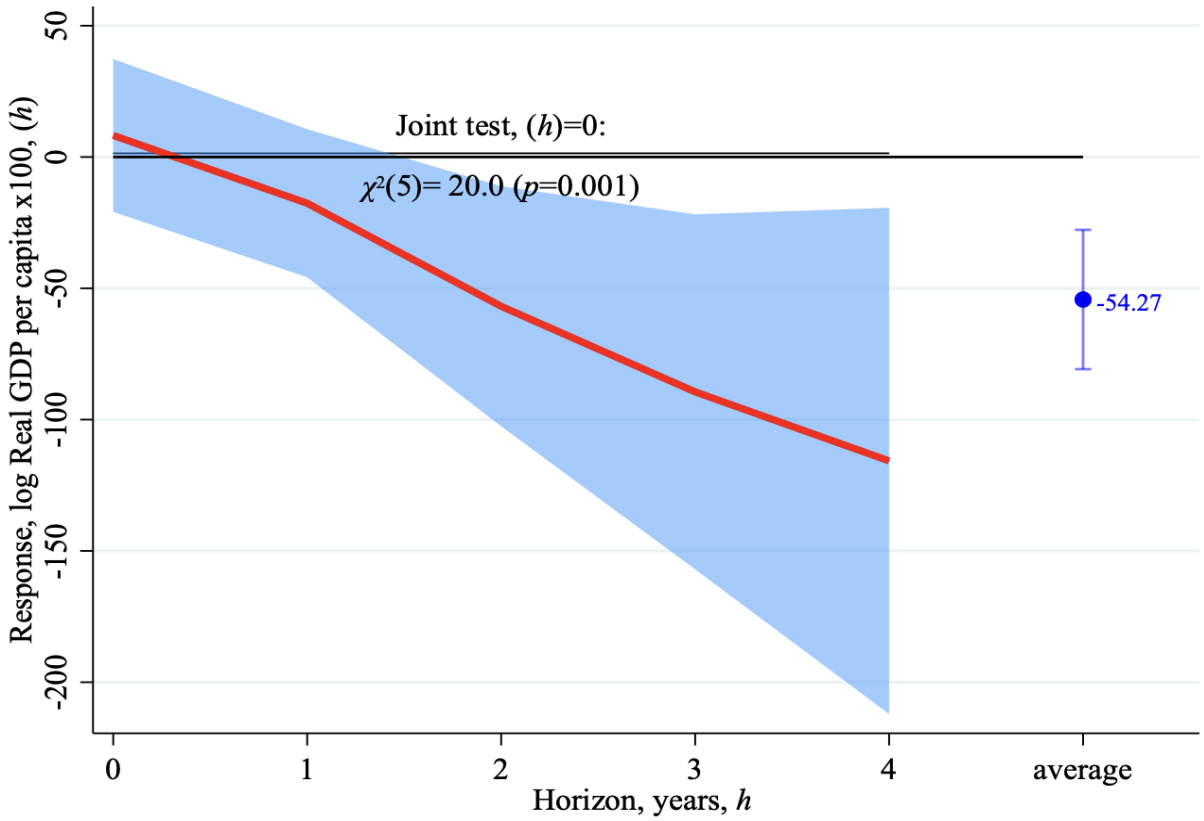
Notes: Fig. 4 presents the results derived from an IV-LP framework (i.e., two lags) based on boom and slump episodes, where the log of GDP is the outcome variable, and FC shocks are the principal explanatory indicator. Standard errors are computed using clustering at the country level. The joint significance of coefficients across various forecast horizons h is assessed using a χ^2 test, with the corresponding p-value in each subplot indicating statistical relevance. The coefficients in Fig. 4 reflect the average dynamic response of GDP to FC shocks over time.

3.3 The impact of uncertainties

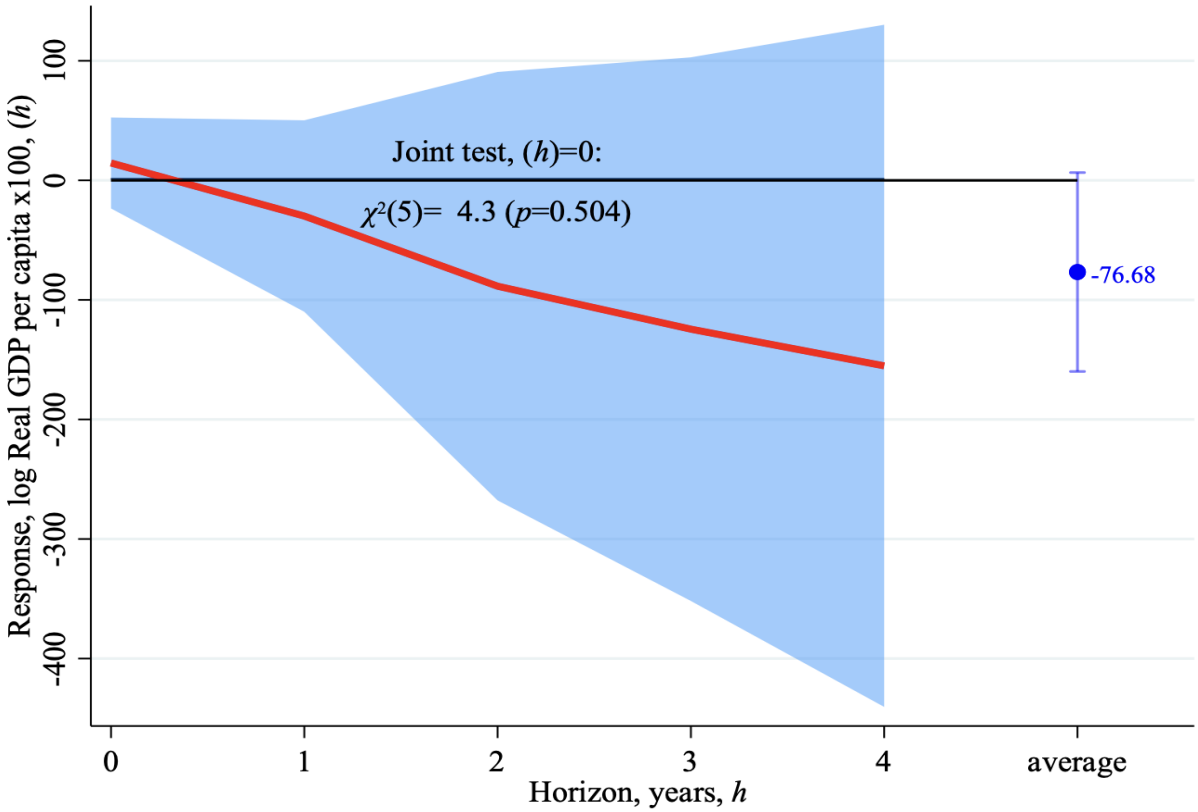
We examine two distinct indicators of uncertainty – GPR and EPU – as visualized in Figs. 5 and 6. These uncertainty levels are categorized based on whether their annual values exceed or fall below the 25th percentile of the sample distribution. To investigate how economic growth responds to FC across varying uncertainty regimes, we estimate Eq. (2). The IV-LP framework reveals that, relative to the baseline estimates, the cumulative impulse response of FC becomes more pronounced under extreme conditions. Notably, while the estimated impact of FC is consistently larger during periods of low geopolitical and policy-related uncertainty compared to high-uncertainty contexts, these differences are not statistically significant in absolute terms. For instance, the cumulative response under low GPR conditions fails to reject the null hypothesis at the 5% level (p = 0.07). This suggests that although economic growth appears to react more strongly to FC shocks in stable environments, the adverse effects tend to gain statistical relevance when uncertainty is elevated.

From a theoretical perspective, periods of heightened geopolitical or economic uncertainty alter the decision-making behavior of firms and households. Specifically, uncertainty increases the option value of waiting, prompting economic agents to delay irreversible investments and consumption (Bernanke, 1983; Bloom, 2009). This precautionary behavior dampens the responsiveness of the economy to fiscal actions. In contrast, when uncertainty is low, agents

are more likely to interpret FC as a credible and stable policy shift, leading to stronger and more immediate responses. Auerbach and Gorodnichenko (2012) showed that fiscal multipliers vary depending on the prevailing economic regime, with consolidation exerting a more contractionary effect in recessive or high-uncertainty environments. Similarly, Caggiano et al. (2015) contended that fiscal shocks have larger macroeconomic effects when policy credibility and confidence are high, conditions more likely to prevail in low-uncertainty periods. Nonetheless, our results align with Romer and Romer (2010) and Guajardo et al. (2014), who argued that the impact of fiscal adjustments depends crucially on the context in which they are implemented. Further, Ramey and Zubairy (2017) validated that the state of the economy conditions the economic response to fiscal interventions.

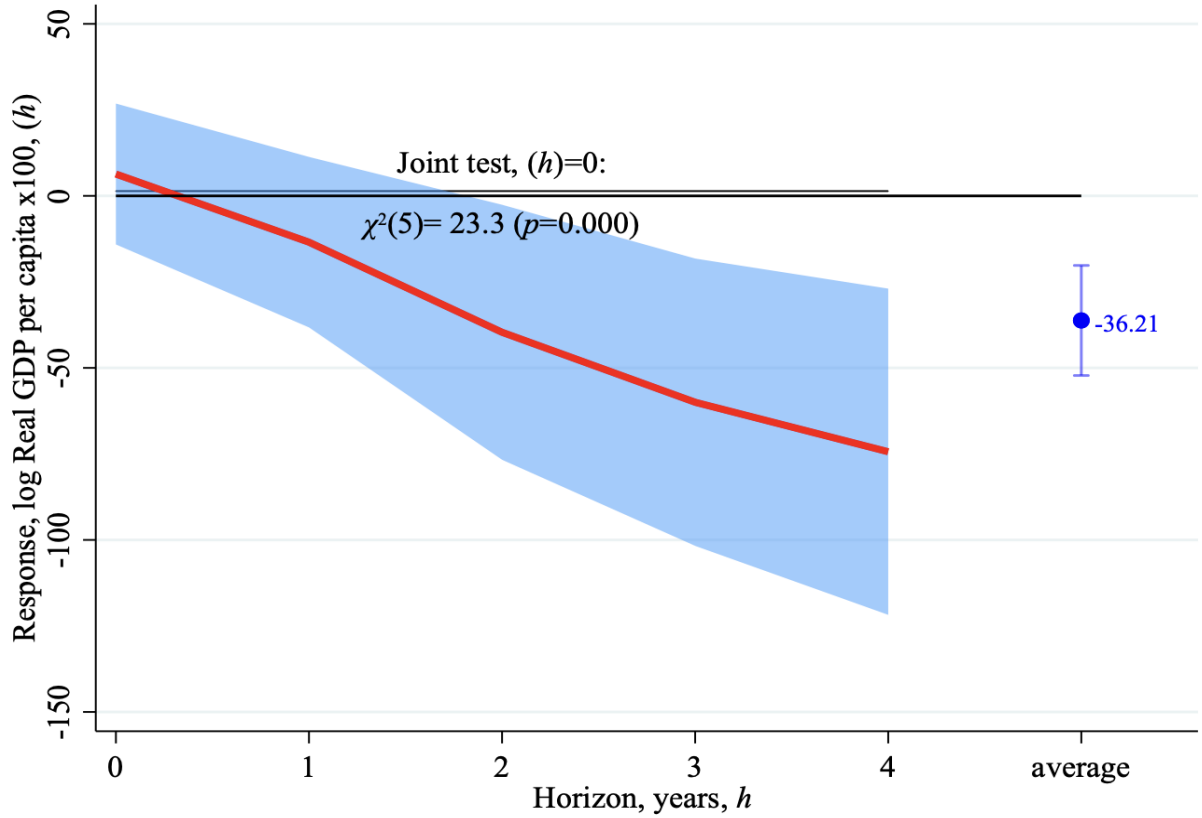


(a) High GPR scenario.

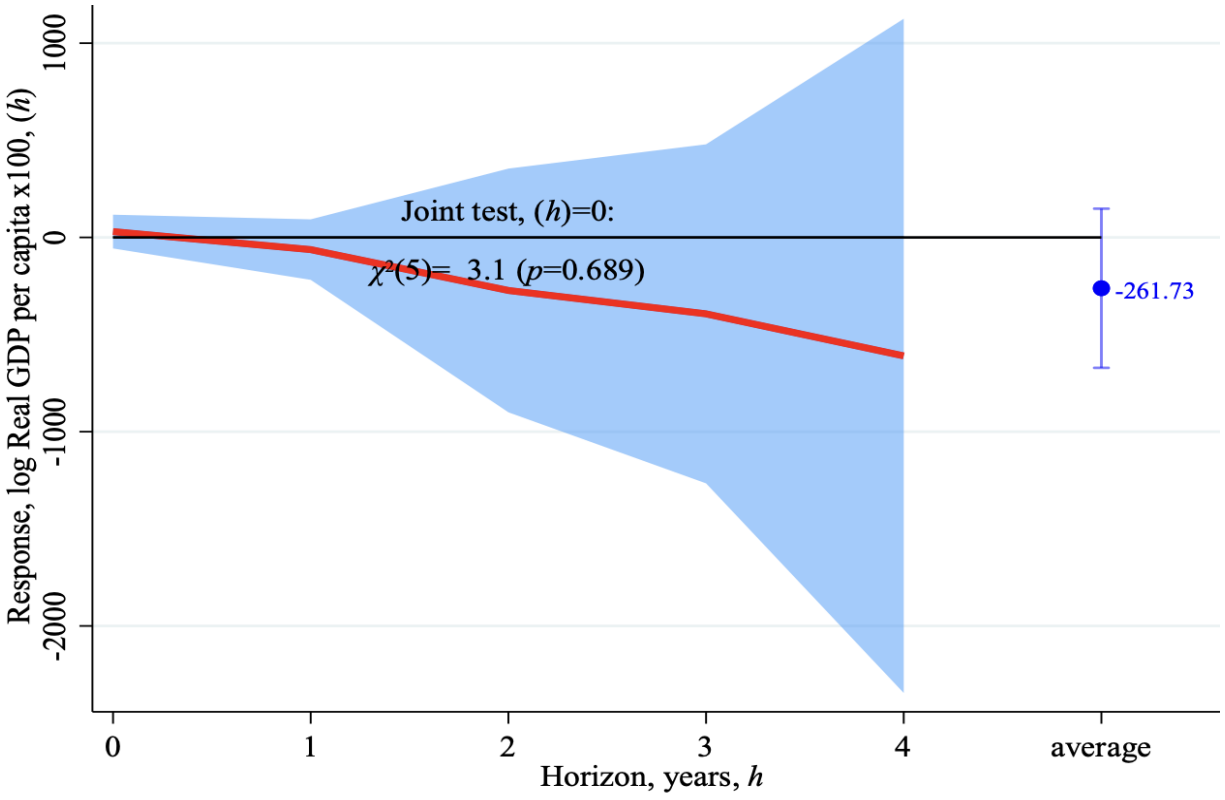


(b) Low GPR scenario.

Fig. 5. Impact of fiscal consolidation on real per capita GDP conditional on varying GPR levels. *Notes*: Fig. 5 presents the results derived from an IV-LP framework (i.e., two lags) based on different GPR levels, where the log of GDP is the outcome variable, and FC shocks are the principal explanatory indicator. Standard errors are computed using clustering at the country level. The joint significance of coefficients across various forecast horizons h is assessed using a χ^2 test, with the corresponding p-value in each subplot indicating statistical relevance. The coefficients in Fig. 5 reflect the average dynamic response of GDP to FC shocks over time.



(a) High EPU scenario.



(b) Low EPU scenario.

Fig. 6. Impact of fiscal consolidation on real per capita GDP conditional on varying EPU levels. *Notes*: Fig. 6 presents the results derived from an IV-LP framework (i.e., two lags) based on different EPU levels, where the log of GDP is the outcome variable, and FC shocks are the

principal explanatory indicator. Standard errors are computed using clustering at the country level. The joint significance of coefficients across various forecast horizons h is assessed using a χ^2 test, with the corresponding p-value in each subplot indicating statistical relevance. The coefficients in Fig. 6 reflect the average dynamic response of GDP to FC shocks over time.

4. Conclusions

Employing the IV-LP estimation strategy, we find consistent evidence that fiscal consolidation efforts exert a contractionary effect on economic growth across Sub-Saharan African economies, independent of the specific adjustment instruments used. This finding diverges from the conclusions drawn by Badru et al. (2025) and Woldu and Szakálné Kanó (2023). Furthermore, our analysis underscores that under elevated global uncertainty – irrespective of the uncertainty metric adopted – the adverse impact of fiscal tightening on growth dynamics becomes notably more severe than periods characterized by lower uncertainty.

Policymakers in SSA should avoid procyclical fiscal tightening during periods of global uncertainty. Instead, countercyclical fiscal frameworks, supported by international financial buffers and adaptive spending mechanisms, can mitigate economic contraction. Strengthening institutional resilience and enhancing transparency in public finance will also improve the effectiveness of fiscal policy under uncertainty.

Appendix A: Multiplier effects based on full sample, boom, and slump episodes.

Table A1 presents the estimated fiscal multipliers derived using the IV-LP approach. Identifying boom and downturn phases is consistent with the criteria outlined in Section 3.2. Across all model variants, the estimated multipliers tend to be negative, though not statistically distinguishable from zero. Notably, impulse response functions exhibit considerable heterogeneity across different model configurations. A recurring pattern emerges: fiscal contraction exerts more pronounced effects when the scale of discretionary adjustments increases, particularly at the three- and four-year horizons. During periods of economic downturn, the impulse responses consistently show negative values, in contrast to boom and full-sample conditions, which trace comparable response paths. One of the central insights from these estimates is that fiscal tightening delivers significantly more contractionary outcomes for economic activity in SSA during slumps than during expansions or in the aggregate sample.

Modern macroeconomic theory reinforces that the effect of fiscal policy is state-dependent, that is, the same fiscal action (i.e., spending cuts) can yield different output responses depending on the prevailing economic conditions. In recessionary periods, aggregate demand is typically constrained by slack in labor and capital markets. Under these conditions, Keynesian models with price and wage rigidities predict larger multipliers, since fiscal contractions reduce demand further when the economy is already below potential (Auerbach and Gorodnichenko, 2012).

Table A1
Multiplier effects.

H	Full	Boom	Slump
0	5.25	9.60	-5.01
	(19.67)	(14.86)	(38.10)
1	-2.10	2.65	-10.03
	(7.14)	(5.66)	(16.19)
2	-5.42	-1.96	-12.11
	(3.38)	(3.05)	(7.82)
3	-7.12***	-5.54***	-13.18***
	(2.02)	(2.01)	(4.63)
4	-7.51***	-7.80***	-12.83***
	(1.31)	(1.42)	(3.02)
Avg.	-3.39	-0.61	-10.63
	(4.27)	(3.28)	(8.50)

Notes: ***, p<1%; standard errors are reported in parentheses. Table A1 presents the multiplier effects derived from an IV-LP framework (i.e., two lags) based on full, boom, and slump episodes, where the log of GDP is the outcome variable, and FC shocks are the principal explanatory indicator. The abbreviation Avg. suggests the average dynamic response of GDP to FC shocks over time under different scenarios.

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