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Fiscal and Monetary Policy Shocks and Private Sector Activity: Evidence Across Countries¹

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Abstract

This paper examines the relationship between fiscal- and monetary-policy shocks and private-sector outcomes, with a focus on private investment, private credit, and firm creation, by using an annual panel of 148 countries over the period 1970–2023. We construct measures of cyclically adjusted fiscal shocks and forecast-error monetary shocks and analyze their association with private-sector activity using long-run panel regressions and state-dependent local projections. The average long-run relationships between policy shocks and private-sector outcomes are generally weak and often statistically insignificant. Yet substantial heterogeneity does emerge across countries with different levels of fiscal space, financial development, informality, inequality, and institutional quality. Fiscal expansions are more strongly associated with private-sector activity in low-debt, institutionally stronger environments, while monetary easing is linked to greater firm creation and credit growth in financially constrained and highly informal economies. Overall, the findings suggest that the relationship between macroeconomic policy shocks and private-sector development depends critically on structural and institutional characteristics.

JEL Codes: E52, E62, O16, O23, F34

Keywords: Fiscal shocks, monetary shocks, private investment; firm creation, private credit

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1. Introduction

Fiscal and monetary policy remain the principal macroeconomic instruments available to governments and central banks for stabilizing economic activity and supporting long-term development. Beyond their effects on aggregate output, inflation, and employment, policy interventions may also influence key dimensions of private-sector activity, including investment, access to credit, and business formation. These outcomes are central to economic growth, productivity enhancement, and structural transformation, yet comparatively less attention has been devoted to understanding how they respond to fiscal- and monetary-policy shocks in a unified cross-country framework.

There is a substantial body of literature on the macroeconomic consequences of fiscal- and monetary-policy interventions. Fiscal-policy research has focused primarily on output multipliers, employment effects, public debt dynamics, and the consequences of fiscal consolidations and government spending shocks (Alesina and Ardagna, 2010; Alesina et al., 2015; Batini et al., 2014). Similarly, the monetary-policy literature has extensively investigated how interest-rate changes affect inflation, output, financial conditions, and credit markets through traditional interest-rate, credit, and balance-sheet channels (Bernanke and Gertler, 1995; Christiano et al., 2005; Romer and Romer, 2004; Gilchrist and Zakrajšek, 2012; Tenreyro and Thwaites, 2016). However, relatively few papers have examined the association of fiscal- and monetary-policy shocks with private-sector outcomes such as investment, credit expansion, and firm creation across a broad set of countries. Moreover, fiscal and monetary policies are often studied separately, despite operating simultaneously and interacting through financial conditions, sovereign-risk perceptions, public debt dynamics, and expectations.

Understanding these relationships is particularly important because the effects of macroeconomic policy are unlikely to be uniform across countries. A growing body of evidence suggests that fiscal space, financial development, institutional quality, and broader macroeconomic conditions influence the transmission of both fiscal and monetary policy (Auerbach and Gorodnichenko, 2013; Ilzetzki et al., 2013; Mishra et al., 2014; Huidrom et al., 2020). Economies characterized by stronger institutions, deeper financial markets, and more-sustainable fiscal positions may see different responses to policy interventions than economies facing tighter financing constraints, weaker governance, or larger informal sectors. Such heterogeneity raises important questions regarding the circumstances under which policy actions are more closely associated with private-sector dynamism.

Against this background, this paper addresses three related questions. First, how are fiscal- and monetary-policy shocks associated with private-sector outcomes, notably private investment, private credit, and firm creation? Second, to what extent do structural characteristics such as informality, inequality, governance, and financial development shape these relationships? Third, do fiscal- and monetary-policy shocks interact in ways that reinforce or offset their association with private-sector activity?

To address these questions, we construct measures of cyclically adjusted fiscal shocks and forecast-error monetary shocks using annual data for a broad panel of countries over the period 1970–2023. Fiscal shocks are defined as large changes in cyclically adjusted government spending, while monetary shocks are defined as deviations of policy rates from values predicted by standard macroeconomic fundamentals. These measures are designed to capture discretionary policy movements in a consistent cross-country framework rather than narrative or action-based policy interventions available only for a limited number of economies. The empirical analysis combines long-run panel regressions with local projections (Jordà, 2005), allowing us to examine both average relationships and dynamic responses across different macroeconomic and institutional environments.

This paper contributes to the literature in two principal respects. First, it provides cross-country evidence on the relationships between fiscal- and monetary-policy shocks and private-sector outcomes that have received comparatively less attention than traditional macroeconomic aggregates, namely private investment, private credit, and firm creation. The existing evidence largely relates to output, inflation, employment, and broad financial aggregates, while the implications of policy shocks for entrepreneurship and private-sector development remain less explored. Second, the paper examines how these relationships vary across countries with different levels of fiscal space, financial development, institutional quality, inequality, and informality. In doing so, it contributes to the broader literature that emphasizes the conditional effectiveness of macroeconomic policy and the importance of structural characteristics in shaping economic outcomes.

The findings suggest that average long-run relationships between fiscal- and monetary-policy shocks and private-sector outcomes are generally weak and often statistically insignificant, yet considerable heterogeneity does emerge across countries and policy environments. Fiscal expansions are more strongly associated with private-sector activity in countries characterized by lower public debt burdens and stronger institutional quality, while monetary easing is linked to stronger firm creation and credit growth in financially constrained and highly informal economies. Conversely, these relationships tend to be weaker in high-debt and weaker-governance environments. Dynamic estimates further indicate that monetary tightening is associated with relatively rapid and persistent declines in private investment and credit, while the relationship between fiscal shocks and private-sector outcomes appears more sensitive to institutional and structural conditions. Overall, the results suggest that the relationship between macroeconomic-policy shocks and private-sector development depends significantly on the economic and institutional environment in which policy operates.

The remainder of the paper is organized as follows: Section 2 reviews the related literature; Section 3 presents the conceptual framework and develops the main hypotheses; Section 4 describes the data, shock construction, and empirical methodology; Section 5 presents the empirical results and robustness analysis; and Section 6 concludes.

2. Literature Review

Fiscal and monetary policy remain central instruments of macroeconomic stabilization and economic development and their effects have been extensively studied across both advanced and developing economies. A large fiscal-policy literature examines how discretionary government spending and taxation influence economic activity, employment, public debt dynamics, and welfare outcomes (Blanchard and Perotti, 2002; Perotti, 2004; Ramey, 2011; Alesina et al., 2015; Batini et al., 2014). Similarly, monetary-policy research has documented the role of interest-rate changes in shaping inflation, output, financial conditions, and credit markets through a variety of transmission channels (Bernanke and Gertler, 1995; Christiano et al., 2005; Romer and Romer, 2004; Gilchrist and Zakrajšek, 2012; Tenreyro and Thwaites, 2016). More recently, attention has shifted toward understanding how policy transmission varies across institutional settings and macroeconomic environments, particularly following the global financial crisis, the COVID-19 pandemic, and the subsequent tightening cycle experienced by many economies.

The fiscal-policy literature highlights several channels through which government actions may influence private-sector activity. Traditional Keynesian frameworks emphasize aggregate-demand effects, whereby fiscal expansions stimulate output and private investment through stronger demand and improved expectations (Baxter and King, 1993; Miyamoto et al., 2020). Alternative perspectives stress the importance of fiscal sustainability, public debt accumulation, and sovereign-risk considerations, which may offset potential expansionary effects through higher financing costs and increased uncertainty (Corsetti et al., 2013). Empirical evidence increasingly suggests that fiscal outcomes depend on the composition of fiscal adjustment, prevailing debt conditions, and institutional quality (Alesina et al., 2015; Huidrom et al., 2020). Moreover, fiscal multipliers appear highly heterogeneous across countries and states of the business cycle, with larger effects often observed when fiscal positions are stronger and financial conditions more supportive (Auerbach and Gorodnichenko, 2013; Ilzetzki et al., 2013).

In parallel, monetary-policy transmission has been examined through interest-rate, bank-lending, balance-sheet, and expectations channels. Monetary tightening generally raises financing costs and weakens investment and credit growth, while monetary easing can alleviate borrowing constraints and support economic activity (Bernanke and Gertler, 1995; Gilchrist and Zakrajšek, 2012). However, a growing literature emphasizes that monetary transmission is neither constant nor uniform across countries. Financial development, banking-sector characteristics, policy credibility, exchange-rate regimes, and fiscal conditions all influence the strength of monetary-policy effects (Mishra et al., 2014; Tenreyro and Thwaites, 2016). Recent research further suggests that the effectiveness of monetary policy may vary across economic conditions, reflecting differences in debt burdens, financial frictions, and macroeconomic uncertainty (Christiano et al., 2005; Gilchrist and Zakrajšek, 2012).

Despite these advances, much of the literature remains focused on aggregate macroeconomic outcomes. Fiscal-policy studies typically examine output, employment, public debt, and distributional effects, while monetary-policy research concentrates on inflation, output, asset prices, and broad credit aggregates. Comparatively less attention has been devoted to understanding how policy shocks relate to private-sector outcomes such as investment, business formation, and access to credit. Yet these variables represent important channels through which macroeconomic policies may influence productive capacity, entrepreneurship, innovation, and long-term growth. The existing evidence is often derived from single-country analyses, specific policy episodes, or firm-level studies covering relatively short time periods (Aghion et al., 2019).

A related strand of research emphasizes the importance of institutional and structural conditions in shaping policy transmission. Fiscal space, governance quality, financial development, corruption, inequality, and labor-market informality can all influence the responsiveness of private-sector activity to policy interventions. Stronger institutions and deeper financial markets generally facilitate policy transmission by improving access to finance and reducing uncertainty, whereas weak governance, segmented credit markets, and extensive informality may attenuate the effectiveness of both fiscal and monetary policies (La Porta and Shleifer, 2014; Ulyssea, 2018). More broadly, recent contributions highlight the role of state capacity and institutional quality as fundamental determinants of macroeconomic performance and policy effectiveness (Besley and Persson, 2014; Acemoglu and Robinson, 2019).

Another important insight concerns the interaction between fiscal and monetary policies. Rather than operating independently, the two policy instruments often interact through debt dynamics, sovereign-risk premia, financial conditions, and expectations. Theoretical contributions have long emphasized the importance of fiscal-monetary interactions for macroeconomic stability (Sargent and Wallace, 1981; Leeper, 1991). More-recent empirical evidence suggests that fiscal conditions can materially influence the effectiveness of both fiscal and monetary interventions, particularly when public debt levels are elevated or policy credibility is limited (Corsetti et al., 2013; Huidrom et al., 2020; Jordà and Taylor, 2016). These findings reinforce the need to analyze fiscal and monetary shocks jointly rather than in isolation.

This paper contributes to these literatures in two respects. First, it examines the relationship between fiscal- and monetary-policy shocks and a set of private-sector outcomes (private investment, private credit, and firm creation) that have received comparatively less attention than traditional macroeconomic aggregates in cross-country analyses. Second, it investigates how these relationships vary across countries with different levels of fiscal space, financial development, governance quality, inequality, and informality. By combining long-run panel regressions with local projections in a large panel of countries spanning more than five decades, the paper provides new evidence on the extent to which structural and institutional characteristics shape the relationship between macroeconomic-policy shocks and private-sector activity.

3. Conceptual Framework and Transmission Channels

This section outlines the main mechanisms through which fiscal- and monetary-policy shocks may be associated with private-sector outcomes. Rather than presenting a fully specified structural model, the objective is to provide a conceptual framework that motivates the empirical analysis and highlights the channels through which policy shocks can influence private investment, private credit, and firm creation. The discussion emphasizes the roles of fiscal conditions, financial development, governance, and informality in shaping the transmission of macroeconomic policy.

3.1 Fiscal Policy and Private-Sector Activity

Fiscal policy may influence private-sector activity through both demand-side and confidence-related channels. In a simplified setting, private-sector activity can be expressed as

$$PSA_t = f(D_t, E_t, RP_t) \quad (1)$$

where PSA_t denotes private-sector activity (investment, credit, or firm creation), D_t captures aggregate demand conditions, E_t represents expectations regarding future economic activity, and RP_t denote sovereign and macroeconomic risk premia.

Fiscal expansions may stimulate demand and improve expectations:

$$\frac{\partial D_t}{\partial F_t} > 0, \frac{\partial E_t}{\partial F_t} > 0 \quad (2)$$

where F_t denotes a positive fiscal-policy shock.

However, fiscal expansions may also increase concerns about fiscal sustainability, particularly when public debt is elevated:

$$\frac{\partial RP_t}{\partial F_t} > 0 \text{ if } Debt_t \text{ is high} \quad (3)$$

The overall relationship between fiscal-policy shocks and private-sector activity therefore depends on the balance between demand-supporting effects and the potential increase in risk premia.

3.2 Monetary Policy and Private-Sector Activity

Monetary policy primarily affects private-sector decisions through borrowing costs and credit conditions. Let the effective cost of financing be given by

$$FC_t = i_t + \mu_t \quad (4)$$

Where i_t denotes the policy interest rate and μ_t represents a credit or external-finance premium.

Private investment and firm creation are expected to vary inversely with financing costs:

$$\frac{\partial PSA_t}{\partial FC_t} < 0 \quad (5)$$

Monetary easing may therefore be associated with greater investment, credit growth, and entrepreneurial activity by lowering financing costs and easing liquidity constraints. Conversely, monetary tightening may be associated with weaker private-sector outcomes through higher borrowing costs and tighter credit conditions.

3.3 Structural and Institutional Conditioning Factors

The transmission of both fiscal and monetary policy may depend on structural and institutional characteristics. We summarize these influences through a transmission parameter:

$$\theta_t = g(FD_t, GOV_t, INF_t, FS_t) \quad (6)$$

Where FD_t denotes financial development, GOV_t institutional quality, INF_t informality, and FS_t fiscal space.

Private-sector activity can therefore be represented as

$$PSA_t = \alpha + \beta_F F_t + \beta_M M_t + \theta_t(F_t, M_t) + \varepsilon_t \quad (7)$$

Where M_t denotes a monetary policy shock and θ_t captures the extent to which structural conditions modify the relationship between policy shocks and private-sector outcomes.

Stronger institutions, deeper financial systems, and greater fiscal space may facilitate policy transmission, whereas high informality, weak governance, and limited financial development may attenuate it.

3.4 Empirical Implications

The framework suggests three empirical implications. First, fiscal and monetary policy shocks may be associated with private-sector outcomes through demand, financing cost, and expectations channels. Second, these relationships are unlikely to be homogeneous across countries, because institutional and structural conditions can strengthen or weaken policy transmission. Third, short-run responses may differ from average long-run relationships, particularly when policy transmission depends on fiscal space, financial development, governance, or informality.

These considerations motivate the empirical strategy adopted in this paper. Long-run panel regressions are used to examine average cross-country relationships between

policy shocks and private-sector outcomes, while local projections are employed to trace their dynamic responses and assess the importance of state dependence and structural heterogeneity.

4. Empirical Methodology and Data

This section outlines the empirical strategy used to quantify the effects of fiscal and monetary shocks on private-sector outcomes. Guided by the theoretical framework in Section 3, we combine two complementary approaches. The first is a long-run panel regression that captures persistent relationships between exogenous policy shocks and private investment, credit, and firm creation. The second is a local projection (LP) framework that traces short- and medium-term dynamic responses to these shocks, allowing for nonlinear and state-dependent effects. Both strategies rely on newly constructed cross-country fiscal and monetary shock measures for a broad cross-country sample of advanced and emerging market economies.

4.1. Identification of Fiscal and Monetary Shocks

4.1.1 Fiscal shocks: Cyclically adjusted innovations in aggregate primary spending

We focus on aggregate primary expenditure (real terms), not balances, to capture discretionary government demand directly linked to private-sector outcomes (investment, entry, credit). The first step is to obtain country-specific output elasticities and cyclical adjustment. That is, for each country we estimate the output elasticity of primary spending by regressing on (and lags if needed) over available years with ≥ 15 consecutive observations. The cyclically adjusted series is then

$$\text{CAPEX}_{it} \equiv \frac{G_{it}}{(Y_{it}/Y_{it}^{\text{pot}})^{\hat{\epsilon}_i}},$$

where Y_{it}^{pot} is potential output (baseline Hodrick-Prescott [HP] filter; Hamilton [2018] filter in robustness), and the estimated elasticity.⁴

The second step relates to defining 'large' discrete episodes. Let $\Delta \text{CAPEX}_{it} \equiv \log \text{CAPEX}_{it} - \log \text{CAPEX}_{it-1}$ define the country-specific threshold as one standard deviation of ΔCAPEX_{it} of the sample. We record expansionary fiscal shocks when $\Delta \text{CAPEX}_{it} \geq \Delta \bar{\text{CAPEX}}_i + \sigma_i$ and contractionary shocks when $\Delta \text{CAPEX}_{it} \leq \Delta \bar{\text{CAPEX}}_i - \sigma_i$. The binary indicators $\varepsilon_{it}^{F,+}$ and $\varepsilon_{it}^{F,-}$ equal one in those years and zero otherwise. This discrete, cyclically adjusted definition targets salient, plausibly

⁴ Residual cyclical comovement can alternatively be purged by projecting on contemporaneous and lagged residuals; both routes produce near-identical adjusted changes in practice.

discretionary moves rather than small automatic stabilizers (see also the defense-function application, which uses identical logic for military outlays).

Step 3 addresses the need for normalization by fiscal event size (percentage of GDP). That is, for interpretability of impulse responses, we scale the binary shock by the average size of the underlying spending change in percentage of GDP during shock years in each country:

$$\tilde{\varepsilon}_{it}^{F,\pm} \equiv \varepsilon_{it}^{F,\pm} \times \Delta G_{it}^- / Y_{it} \text{ (mean over years with } \varepsilon_{it}^{F,\pm} = 1).$$

This allows the reading of the LP coefficients as the response to a 'typical' spending event (e.g., +0.4–0.6 pp of GDP in emerging market and developing economies, EMDEs), a practice shown to improve cross-country comparability.

The final step, step 4, involves putting together continuous measures for sensitivity. Alongside the discrete indicators, we compute two continuous counterparts: (1) growth of CAPEX: $g_{it}^F \equiv \Delta \log \text{CAPEX}_{it}$; and (2) level change (% of GDP): $\Delta(G_{it}/Y_{it})$ (winsorized at 1st/99th percentiles). The results are robust across these definitions.

4.1.2 Monetary shocks

To construct a measure of monetary policy shocks, we adopt a residual-based approach related to the forecast-error methodology of Furceri, Loungani, and Zdzienicka (2018). The objective is to identify policy-rate movements that are not explained by standard macroeconomic fundamentals or by the persistence typically observed in monetary policy decisions. The resulting measure captures the component of policy-rate changes that cannot be readily attributed to systematic responses to inflation, economic activity, or external conditions.

The shock estimation proceeds by regressing the annual change in the policy rate on a set of lagged macroeconomic determinants together with lagged policy-rate changes to account for policy inertia. Formally, for each country and year, we estimate

$$\Delta r_{i,t} = \alpha_i + \gamma_t + \beta_1 \pi_{i,t-1} + \beta_2 y_{i,t-1} + \beta_3 x_{i,t-1} + \beta_4 \Delta r_{i,t-1} + \varepsilon_{i,t},$$

Where $\Delta r_{i,t}$ denotes the annual change in the short-term policy rate, $\pi_{i,t-1}$ represents lagged inflation, $y_{i,t-1}$ captures lagged economic activity (typically an output-gap measure), and $x_{i,t-1}$ denotes lagged external conditions, such as the current-account balance as a share of GDP. Country fixed effects (α_i) absorb persistent differences in monetary-policy frameworks and institutional characteristics, while year fixed effects (γ_t) capture common global shocks and synchronized business-cycle movements. Estimation uses heteroskedasticity-robust standard errors clustered at the country level.

The residuals from this regression, denoted by $\varepsilon_{i,t}$, constitute the raw monetary shock measure. These residuals capture policy-rate movements that are not explained by lagged

inflation, economic activity, external conditions, or typical policy persistence. In this sense, they provide a proxy for discretionary policy movements beyond those predicted by observable macroeconomic fundamentals. Because the specification removes both systematic policy responses and common time effects, the resulting measure focuses on the unexplained component of monetary-policy changes.

To facilitate comparability across countries with different levels of monetary-policy volatility, the residuals are standardized within each country according to

$$Shock_{i,t}^* = \frac{\varepsilon_{i,t}}{sd_i(\varepsilon_{i,\cdot})},$$

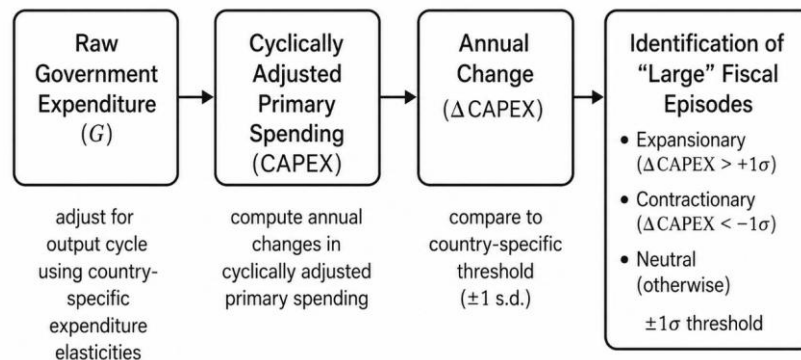
where $sd_i(\varepsilon_{i,\cdot})$ denotes the within-country standard deviation of the residual series. This transformation preserves the sign and timing of policy shocks while normalizing their magnitude, allowing for meaningful comparisons across countries with heterogeneous monetary-policy frameworks and levels of interest-rate volatility.

The resulting standardized series is used throughout the empirical analysis as the measure of monetary-policy shocks. The approach provides a transparent and replicable way of constructing comparable cross-country shock measures while focusing on policy-rate movements that are not explained by observed macroeconomic conditions.

4.1.3 A Unified Framework for Fiscal and Monetary Shock Identification

This joint identification approach extends the cross-country fiscal-monetary-shock tradition, combining country-specific output elasticities, cyclical adjustment, and large-episode detection for fiscal policy (as schematically summarized in Figure 1) with forecast-error-based monetary surprises for the interest-rate channel.

Figure 1. Construction of Fiscal Shock Episodes from Cyclically Adjusted Primary Spending

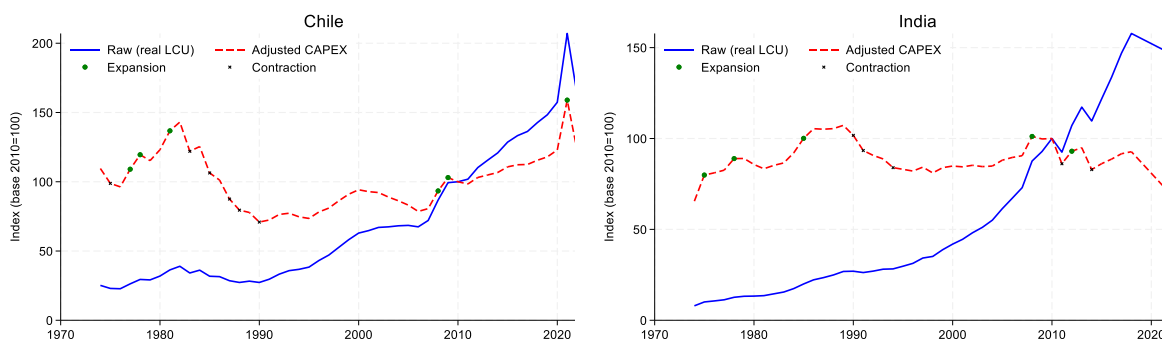


Note: This figure summarizes the sequential procedure used to identify discretionary fiscal shock episodes. Starting from raw government expenditure (G), the series is cyclically adjusted using country-specific expenditure elasticities to obtain cyclically adjusted primary spending (CAPEX). Annual changes in CAPEX

(Δ CAPEX) are then computed and compared with a country-specific threshold equal to one standard deviation of the historical distribution. Fiscal episodes are classified as expansionary (Δ CAPEX $> +1\sigma$), contractionary (Δ CAPEX $< -1\sigma$), or neutral ($|\Delta$ CAPEX| $\leq 1\sigma$). These discrete episodes proxy large discretionary changes in the fiscal stance and constitute the fiscal shock measure used throughout the empirical analysis.

Figure 2 illustrates the construction of discretionary fiscal shocks using cyclically adjusted primary expenditure (CAPEX) for two representative EMDEs, Chile and India. In both cases, the adjusted series (red dashed line) is visibly smoother than raw expenditure (blue line), confirming that the cyclical correction effectively filters out automatic responses to the business cycle. Expansionary and contractionary episodes—identified as large deviations of adjusted spending growth relative to country-specific historical volatility—are relatively infrequent and tend to cluster around periods of heightened macroeconomic stress, such as the global financial crisis and the COVID-19 pandemic. The divergence between raw and adjusted spending during these episodes highlights the importance of CAPEX-based identification for isolating discretionary fiscal policy from cyclical dynamics.

Figure 2. Cyclically Adjusted versus Raw Primary Expenditure and Identified Fiscal Shocks for Selected EMDEs

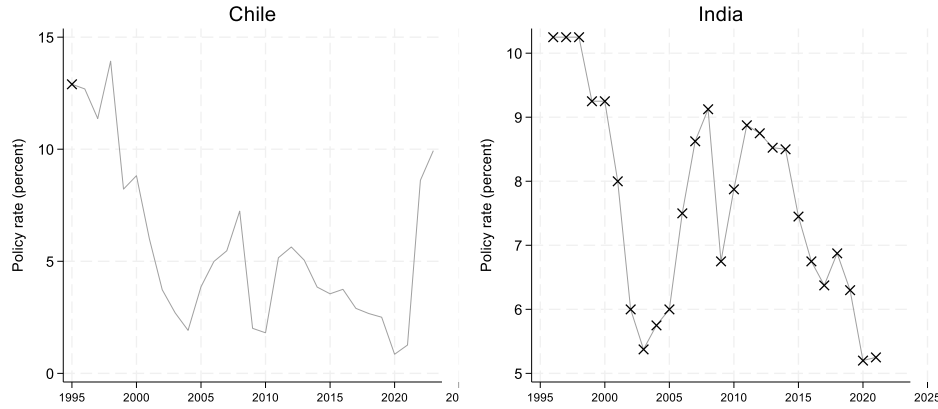


Note: Each panel compares raw real primary expenditure (blue solid line) with its cyclically adjusted counterpart (CAPEX, red dashed line), both indexed to 2010 = 100. Expansionary (green dots) and contractionary (black crosses) fiscal episodes correspond to years when the annual change in cyclically adjusted expenditure exceeds one standard deviation above or below the country-specific mean, respectively. The adjusted series controls for the output cycle using country-specific elasticities and HP-filtered potential GDP.

Figure 3 presents policy-rate paths and identified large monetary policy shocks for two representative EMDEs, Chile and India. Tightening and easing episodes, defined as one standard deviation in the standardized residualized changes of policy rates, are relatively infrequent and tend to cluster around periods of heightened macroeconomic adjustment. India displays several pronounced easing episodes, particularly in the late 1990s and again after the global financial crisis, consistent with periods of accommodative monetary policy in response to economic slowdowns. By contrast, Chile exhibits fewer large easing episodes and a more gradual normalization of interest rates over time. Overall, the figure illustrates how large discretionary monetary shocks are episodic rather

than continuous, reinforcing the empirical strategy we employ, which relies on sharp policy innovations rather than on persistent policy-stance movements.

Figure 3. Policy-Rate Paths and Identified Monetary Policy Shocks for Selected EMDEs



Note: Each panel shows the annual policy interest rate (percent). Large monetary-policy shocks are identified using the standardized residualized annual change in the policy rate. Tightening episodes correspond to years in which the standardized shock exceeds +1 country-specific standard deviation, while easing episodes correspond to years in which the standardized shock falls below -1 country-specific standard deviation. These thresholds identify large, unexpected monetary-policy innovations used in the empirical analysis.

4.2 Empirical Methodology

Having defined and identified exogenous fiscal and monetary shocks, the next step is to quantify their effects on private-sector outcomes. We adopt a two-pillar empirical strategy that combines (1) a long-run panel approach capturing persistent cross-country relationships and (2) a local projection framework estimating short- and medium-run dynamic responses. This combination enables a consistent interpretation of both steady-state correlations and transitional dynamics, while accommodating nonlinearities and state dependence predicted by the theoretical model.

The empirical design follows the principle that fiscal and monetary shocks operate through distinct but complementary channels: fiscal innovations affect aggregate demand and sovereign risk, while monetary surprises influence borrowing costs and balance-sheet conditions. Integrating both shocks in a unified specification allows us to examine the degree of policy complementarity or substitution across heterogeneous institutional and financial environments.

4.2.1 Long-Run Panel Specification

To assess the average relationship between policy shocks and private-sector activity, we estimate a fixed-effects panel model of the form

$$y_{it} = \alpha_i + \tau_t + \beta_F \varepsilon_{it}^F + \beta_M \varepsilon_{it}^M + \gamma' X_{it-1} + u_{it},$$

where y_{it} denotes the outcome variable of interest—log real private investment, log real private credit, the logarithm of new firm registrations, or firm-entry density. All specifications include country fixed effects α_i and year fixed effects τ_t to control for time-invariant heterogeneity and global shocks. The variables ε_{it}^F and ε_{it}^M denote the identified fiscal and monetary shocks, respectively, while X_{it-1} is a vector of lagged macrostructural controls including real GDP growth, inflation, financial depth, and additional external and institutional covariates.

Unlike standard specifications that express investment and credit as shares of contemporaneous GDP, we use log real investment and log real private credit, both deflated by the GDP deflator and expressed in constant-price USD. This choice addresses an important econometric concern inherent to ratio-based outcomes. When investment or credit is scaled by contemporaneous GDP, the dependent variable embeds the same macroeconomic aggregate that is directly affected by both fiscal and monetary shocks. As a result, ratio-based specifications are subject to mechanical denominator effects, whereby a positive GDP response to expansionary policy can generate spurious movements in investment or credit-to-GDP ratios even when the underlying real levels respond positively. By contrast, log real variables isolate the behavior of real private-sector quantities, eliminate scale effects induced by country size, and ensure that estimated policy coefficients reflect genuine quantity responses rather than accounting artifacts driven by the denominator. The logarithm of new firms is used so that coefficients can be interpreted as semi-elasticities of entrepreneurial entry at the extensive margin, while firm-entry density captures the same margin in per-capita terms. The coefficients β_F and β_M therefore measure the long-run semi-elastic response of real private-sector activity to fiscal and monetary shocks, respectively. Positive fiscal shocks ($\varepsilon_{it}^F > 0$) correspond to expansionary spending episodes, while positive monetary shocks ($\varepsilon_{it}^M > 0$) denote unanticipated monetary easings.

All control variables enter the model lagged by one year. This choice mitigates simultaneity and “bad control” problems by ensuring that the conditioning set reflects predetermined macroeconomic conditions known prior to the realization of the policy shock. In contrast, the inclusion of contemporaneous controls would risk partial absorption of the very transmission channels—through growth, inflation, and financial conditions—through which fiscal and monetary policy operate. By construction, the policy shocks are identified as unexpected innovations orthogonal to lagged macroeconomic fundamentals, and are therefore included contemporaneously to capture immediate and longer-run real responses.

All regressions are estimated using within-country least squares with Driscoll–Kraay standard errors, which are robust to heteroskedasticity, serial correlation, and cross-sectional dependence.

4.2.2 Local Projections for Dynamic Responses

To capture the short- and medium-term transmission of policy shocks, we employ the LP method of Jordà (2005). For each forecast horizon $h = 0, \dots, H$, with $H = 5$, and for each shock type $s \in \{M, F\}$ (monetary and fiscal), we estimate panel regressions of the form

$$F^h y_{i,t} = \alpha_i + \tau_t + \sum_{\ell=0}^3 \beta_{h,\ell}^{(s)} \varepsilon_{i,t-\ell}^{(s)} + \sum_{m=1}^h \phi_{h,m}^{(s)} \varepsilon_{i,t+m}^{(s)} + \sum_{j=0}^3 \psi_{h,j} y_{i,t-j} + \sum_{p=0}^1 \Gamma'_{h,p} X_{i,t-p} + u_{i,t+h},$$

Where $F^h y_{i,t} \equiv y_{i,t+h}$ denotes the h -step-ahead value of the outcome variable for country i at time t ; $\varepsilon_{i,t}^{(s)}$ is the standardized structural policy innovation of type s (monetary or fiscal); and $X_{i,t}$ is a vector of control variables including real GDP growth, the GDP deflator, and private bank credit to GDP. The coefficients $\beta_{h,\ell}^{(s)}$ trace the dynamic responses of the outcome variable to a one-standard-deviation shock of type s .

The specification includes up to three lags of the policy shock, three lags of the dependent variable, and one lag of the controls, as well as leads of the policy shock up to horizon h in the spirit of Teulings and Zubanov (2014) to absorb predictable components of future policy changes and mitigate overlapping-horizon and anticipation biases. Lag and lead orders are selected on the basis of the Akaike information criterion (AIC) in preliminary exercises and the results are robust to reasonable variations in these choices. All LPs are estimated with country α_i and time τ_t fixed effects, and we compute Driscoll–Kraay standard errors with a lag length of three to account for serial correlation and cross-sectional dependence. For each shock type s , the reported impulse response functions (IRFs) rescale the coefficient on the contemporaneous shock by the cross-sectional standard deviation of $\varepsilon_{i,t}^{(s)}$, so that the responses correspond to a one-standard-deviation policy shock, and we display 68% and 90% confidence bands.⁵

4.3 Data and Key Stylized Facts

The baseline estimations are conducted on an unbalanced annual panel covering up to 148 countries over the period 1970–2023.⁶ Effective country coverage varies across specifications. The data set integrates fiscal, monetary, financial, institutional, and structural indicators drawn from multiple international sources and harmonized to ensure

⁵ Reporting 68% confidence intervals (one-standard-deviation bands) is standard practice in the monetary-policy shock literature, particularly in studies based on external or narrative instruments. Prominent examples include Romer and Romer (2004, 2010), who use 68% bands to depict the dynamic effects of monetary shocks on output and prices, as well as subsequent applications in the LP and external-instrument literature. Following this convention facilitates comparability with existing empirical work and highlights the central tendency of monetary transmission dynamics.

⁶ The country list (Table A1) is available in Appendix A.

cross-country and intertemporal comparability. The baseline estimations are conducted on a broad cross-country sample comprising both advanced economies (AEs) and emerging market and developing economies (EMDEs). This wide coverage allows us to examine whether the relationship between fiscal- and monetary-policy shocks and private-sector outcomes differs across countries with varying levels of economic development, institutional quality, and financial depth.

Fiscal variables—including primary government expenditure, the primary balance, and gross public debt—are sourced from the IMF World Economic Outlook (WEO) database (IMF 2024). Monetary policy indicators, notably the policy interest rate, inflation, and monetary aggregates, are drawn from the IMF International Financial Statistics (IFS)⁷. Private-sector outcomes—gross fixed capital formation (private share of GDP), domestic credit to the private sector (percent of GDP), and firm-entry density (new limited-liability firms per 1,000 working-age people)—are obtained from the World Bank’s World Development Indicators (WDI) (World Bank 2024).

Institutional and structural controls are compiled from several sources. Income inequality is proxied by the Gini index, which ranges from 0 (perfect equality) to 100 (maximum inequality). Our primary source is the Standardized World Income Inequality Database (SWIID) developed by Solt (2009, 2020), which provides internationally comparable series for both market (gross) and disposable (net) income inequality for up to 177 countries since 1960.

Corruption is measured using a composite “corruption-worsening” index constructed from international corruption indicators. The baseline source is the Transparency International Corruption Perceptions Index (CPI) (Transparency International 2024), originally scaled from 0 (highly corrupt) to 100 (very clean), which is transformed so that higher values denote worse corruption. Where available, this measure is complemented by the World Bank Country Policy and Institutional Assessments⁸ transparency, accountability, and corruption score. The resulting index is normalized to ensure cross-country comparability and a consistent interpretation across specifications.

Informality is also captured using multiple sources. The primary measures come from Elgin et al. (2021), who provide DSGE-model-based estimates of informal output as a share of GDP as well as MIMIC-based estimates and indicators of informal employment.

All nominal variables are converted into constant-price series using country-specific GDP deflators. Fiscal aggregates are expressed as ratios to GDP where appropriate, while private-sector indicators are collected from ratio-based sources. However, for the purposes of estimation private investment and private credit are transformed into real constant-price series and expressed in logarithms. This approach avoids mechanical denominator effects associated with GDP-scaled measures and allows the analysis to focus on changes in underlying private-sector activity. To mitigate the influence of outliers

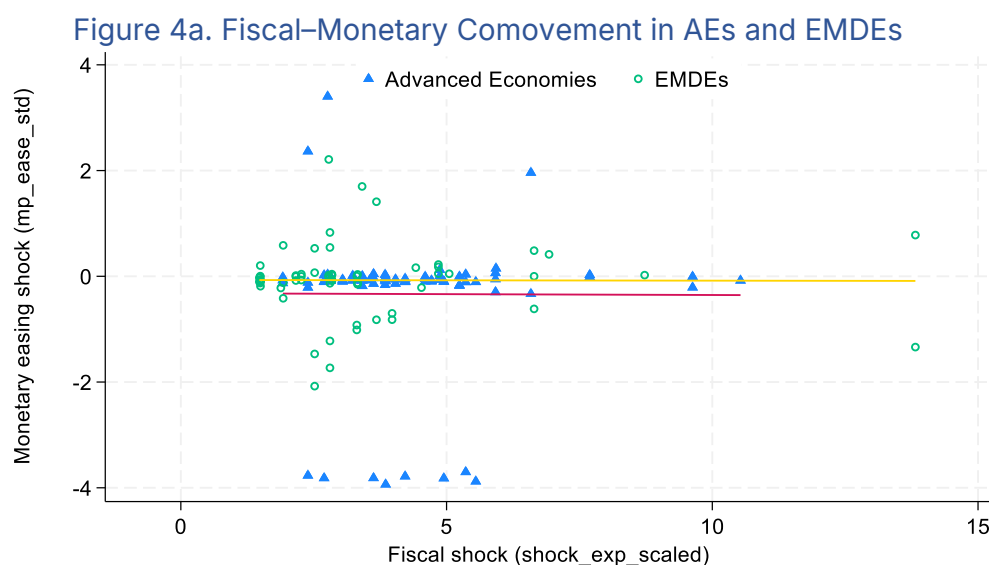
⁷ <https://data.imf.org/en/news/accessing%20international%20financial%20statistics>

⁸ <https://databank.worldbank.org/source/country-policy-and-institutional-assessment>

and extreme crisis observations, all series are winsorized at the 1st and 99th percentiles. The raw data are collected as shares of GDP, but investment and private credit are converted into real constant-price series and expressed in logarithms for estimation.

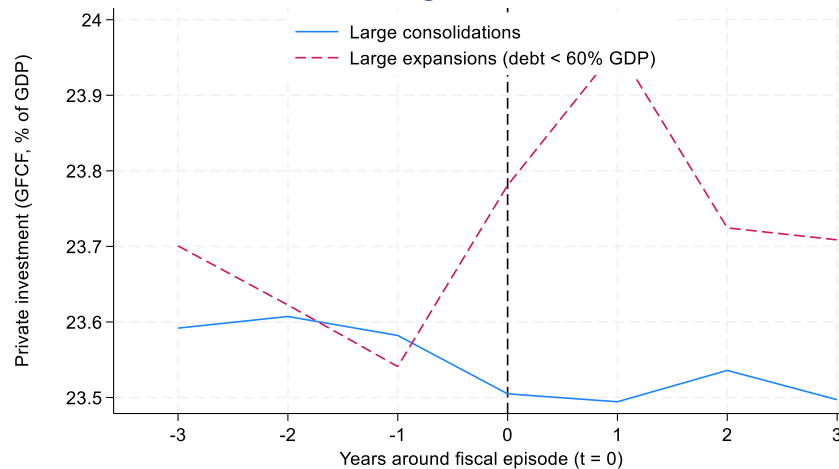
Several stylized facts emerge from the data and motivate the subsequent empirical analysis. First, fiscal and monetary shocks exhibit a modest positive correlation, suggesting some degree of policy comovement (Figure 4a). The relationship appears stronger in AEs than in EMDEs, where greater dispersion points to more -heterogeneous policy frameworks and coordination mechanisms.

Second, private investment displays an asymmetric response around large fiscal episodes (Figure 4b). While investment remains broadly stable following major fiscal consolidations, expansionary fiscal episodes that occur under relatively low public debt are associated with a more pronounced increase in investment. This pattern is consistent with the view that fiscal space may influence the relationship between fiscal policy and private-sector activity.



Note: This figure plots fiscal expansion shocks against monetary-easing shocks for AEs (triangles) and EMDEs (circles). Solid lines represent group-specific linear fits. Observations with zero fiscal shocks are excluded for visual clarity. Monetary shocks are defined such that positive values denote unanticipated policy easing.

Figure 4b. Private Investment around Large Fiscal Consolidations and Expansions

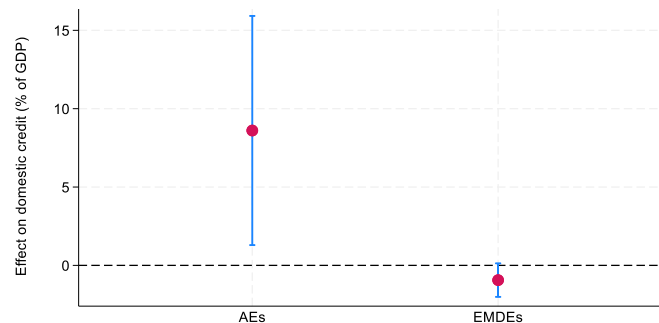


Note: This figure shows the average level of private investment (GFCF, percent of GDP) in a ± 3 -year window around large fiscal consolidation and expansion episodes ($t=0$). Large episodes are defined as fiscal shocks exceeding ± 1 country-specific standard deviation. Expansion episodes are further restricted to cases in which public debt is below 60% of GDP. The vertical dashed line marks the timing of the fiscal episode.

Third, the relationship between monetary policy and credit differs across country groups (Figure 4c). A one-standard-deviation monetary tightening is associated with a modest decline in domestic credit in EMDEs, whereas the corresponding response is considerably weaker—and even positive—in AEs. This suggests that financial development and banking-sector characteristics may shape the transmission of monetary policy.

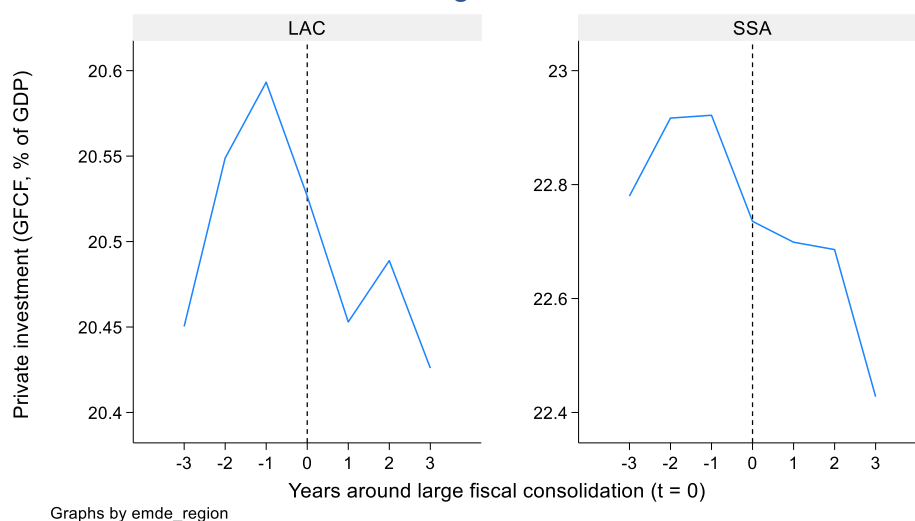
Fourth, substantial regional heterogeneity is evident in investment dynamics around fiscal consolidations (Figure 4d). Asian EMDEs maintain comparatively high and stable investment levels, while investment responses appear weaker and more persistent in Latin America and Sub-Saharan Africa.

Figure 4c. One-Year Response of Domestic Credit to Monetary Tightening: EMDEs vs. AEs



Note: This figure reports the estimated one-year-ahead effect on domestic credit (percent of GDP) of a one-standard-deviation positive monetary-policy shock (monetary tightening). Estimates are obtained from fixed-effects panel regressions with Driscoll-Kraay standard errors (lag=3), separately for AEs and EMDEs. Dots denote point estimates and vertical bars indicate 90% confidence intervals.

Figure 4d. Private Investment around Large Fiscal Consolidations by Selected EMDE region



Note: The figure shows the average level of private investment (percent of GDP) in the three years before and after large fiscal consolidation episodes ($t=0$). Fiscal consolidation episodes are identified using the baseline fiscal-shock methodology and correspond to years in which the annual change in cyclically adjusted primary expenditure falls by more than one country-specific standard deviation below its historical mean. The sample is restricted to EMDEs, which are grouped by the following regions: Latin America, Sub-Saharan Africa, and Asia (East Asia & Pacific and South Asia). The vertical dashed line marks the year of the fiscal consolidation episode.

Taken together, these descriptive patterns point to considerable heterogeneity in the relationship between fiscal- and monetary-policy shocks and private-sector outcomes. They also highlight the potential importance of fiscal space, financial development, and broader institutional conditions, motivating the more formal econometric analysis presented in the following sections.

5. Empirical Results

This section presents the empirical findings on the relationship between fiscal- and monetary-policy shocks and private-sector outcomes. We begin by reporting long-run panel estimates that capture average associations between policy shocks and private investment, credit, and firm creation. We then examine the dynamic responses of these variables using local projections. Next, we explore heterogeneity across institutional and structural characteristics, focusing on informality, inequality, and governance. Finally, we assess the robustness of the results to alternative specifications and sample definitions.

5.1 Long-Run Panel Results

Table 1 reports the baseline panel estimates relating fiscal expansions and monetary easings to real private investment, real private credit, and firm creation. For each outcome, we estimate a fiscal-shock specification, a monetary-shock specification, and a joint model including both shocks simultaneously. All regressions include country and year fixed effects and are estimated using Driscoll–Kraay standard errors. Macroeconomic controls enter with a one-period lag, while policy shocks are included contemporaneously.

Overall, the results point to weak average long-run relationships between policy shocks and private-sector outcomes. Fiscal expansions are small in magnitude and statistically insignificant across all outcomes, both when considered on their own and jointly with monetary shocks. These findings suggest that expansionary fiscal episodes are not systematically associated with stronger long-run investment, credit growth, or firm creation.

Table 1. Baseline Panel Regressions: Fiscal and Monetary Shocks

Variables	(1) Log real GFCF – fiscal only	(2) Log real GFCF – monetary only	(3) Log real GFCF – fiscal & monetary	(4) Log real credit – fiscal only	(5) Log real credit – monetary only	(6) Log real credit – fiscal & monetary	(7) Log new firms – fiscal only	(8) Log new firms – monetary only	(9) Log new firms – fiscal & monetary	(10) Firm density – fiscal only	(11) Firm density – monetary only	(12) Firm density – fiscal & monetary
Fiscal-expansionary shock	0.015 (0.020)		-0.002 (0.009)	0.008 (0.021)		-0.007 (0.008)	-0.001 (0.004)		-0.003 (0.006)	-0.015 (0.043)		-0.065 (0.053)
Monetary-easing shock		-0.068** (0.031)	-0.046** (0.020)		-0.030 (0.052)	0.013 (0.031)		0.065** (0.026)	0.002 (0.023)		-0.122 (0.085)	-0.075 (0.103)
Real GDP growth (<i>t</i> -1)	-0.002 (0.010)	0.017*** (0.005)	0.022*** (0.004)	-0.044** (0.018)	-0.015*** (0.004)	-0.020*** (0.004)	0.009*** (0.002)	0.017*** (0.005)	0.011*** (0.003)	0.050*** (0.012)	0.063*** (0.017)	0.088*** (0.021)
GDP deflator inflation (<i>t</i> -1)	-0.001*** (0.000)	-0.007*** (0.001)	-0.007*** (0.001)	-0.001*** (0.000)	-0.007*** (0.002)	-0.008*** (0.001)	0.001*** (0.000)	0.002*** (0.000)	0.001* (0.001)	0.000 (0.000)	-0.001 (0.002)	0.004* (0.002)
Private bank credit (% of GDP) (<i>t</i> -1)	0.014*** (0.003)	0.004*** (0.001)	0.002** (0.001)				0.004*** (0.001)	0.003*** (0.001)	0.003*** (0.001)	0.009 (0.006)	0.016** (0.006)	0.017** (0.008)
Observations	3,153	1,524	1,197	2,979	1,498	1,156	1,537	852	725	1,537	852	725
Number of groups	135	61	55	148	62	56	131	57	50	131	57	50
Fixed effects	Country & year	Country & year	Country & year	Country & year	Country & year	Country & year	Country & year	Country & year	Country & year	Country & year	Country & year	Country & year

Note: The dependent variables are log of real private investment, log of real private credit, log of new firms, and firm density. Country and year fixed effects included in all specifications. Driscoll–Kraay standard errors (lag=3) in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Monetary easings also exhibit limited long-run associations with private-sector activity. For private investment, the estimated coefficients are negative and statistically significant. This finding likely reflects the countercyclical nature of monetary policy, whereby policy easing tends to occur during periods of weak economic activity and subdued investment demand. As such, the estimated relationship should be interpreted as an association rather than evidence that accommodative monetary policy reduces investment. For private credit, the coefficients are generally small and statistically insignificant. Firm creation exhibits a positive association with monetary easing in some specifications, although this result is not robust across alternative models and measures of entrepreneurial activity.

Among the control variables, real GDP growth is positively associated with investment and firm creation, reflecting the procyclical nature of private-sector activity. Inflation is negatively related to investment and credit, while financial depth is positively associated with investment and entrepreneurial outcomes, underscoring the importance of financial development in supporting private-sector dynamism.

Appendix Tables A3 and A4 present the baseline estimates separately for AEs and EMDEs. Although some differences emerge across country groups, the broad message remains unchanged. Fiscal expansions are generally not associated with robust long-run improvements in private-sector outcomes, while the relationship between monetary easing and private-sector activity remains mixed and often statistically weak. Overall, the evidence suggests that average long-run relationships between policy shocks and private-sector outcomes are limited, motivating the subsequent analysis of dynamic responses and structural heterogeneity.

Tables 2a and 2b present the results of the examination of whether the relationship between fiscal- and monetary-policy shocks and private-sector outcomes varies with fiscal space and institutional quality. Here, the baseline specifications have been augmented with interactions between policy shocks and public debt, as a proxy for fiscal space, and government effectiveness from the World Governance Indicators (WGI).⁹

Table 2a provides limited evidence that fiscal-space or governance conditions systematically modify the relationship between fiscal shocks and private-sector outcomes. Fiscal expansion shocks remain small and statistically insignificant across investment, credit, and entrepreneurial measures, while the interaction terms are generally insignificant. The only exception is a weakly significant positive interaction between fiscal shocks and public debt in the firm-density specification. By contrast, government effectiveness is positively associated with investment, credit, firm creation, and firm density, highlighting the importance of institutional quality for private-sector development. Overall, the results suggest that governance operates primarily through level effects rather than by altering the relationship between fiscal shocks and private-sector activity.

Table 2b points to somewhat stronger heterogeneity for monetary shocks. Higher public debt is consistently associated with weaker private-sector outcomes,

⁹ <https://www.worldbank.org/en/publication/worldwide-governance-indicators>

particularly investment, credit, and firm density. The interaction between monetary easing and public debt is negative and weakly significant in the investment specification, suggesting that highly indebted economies may experience weaker investment responses to accommodative monetary conditions. Government effectiveness again presents positively and significantly across most specifications. The evidence that governance modifies the relationship between monetary shocks and private-sector outcomes is more limited, although the interaction term is negative and statistically significant in the credit regressions.

Taken together, the results provide only limited evidence that fiscal space and governance systematically alter the relationship between policy shocks and private-sector outcomes. However, both public debt and institutional quality remain important correlates of private-sector development, supporting the view that structural conditions shape the broader environment in which fiscal and monetary policies operate.

Table 2a. Fiscal Heterogeneity: Public Debt, Governance, and Private-Sector Responses

	1	2	3	4	5	6	7	8
Variables	GFCF – Debt het.	GFCF – Gov het.	Credit – Debt het.	Credit – Gov het.	Log firms – Debt het.	Log firms – Gov het.	Density – Debt het.	Density – Gov het.
Fiscal- expansionary shock	0.006 (0.024)	-0.004 (0.008)	0.029 (0.024)	-0.010 (0.009)	0.003 (0.012)	0.002 (0.005)	-0.071 (0.088)	-0.017 (0.036)
Real GDP growth	0.024** (0.009)	0.028*** (0.005)	-0.055* (0.028)	0.002 (0.004)	0.015*** (0.002)	0.009*** (0.002)	0.086*** (0.017)	0.049*** (0.010)
GDP deflator inflation	-0.003* (0.001)	-0.001*** (0.000)	-0.010* (0.006)	-0.001*** (0.000)	0.002*** (0.000)	0.001** (0.000)	0.004*** (0.001)	-0.000 (0.001)
Private bank credit (% of GDP)	0.000 (0.001)	0.001* (0.001)			0.003*** (0.001)	0.003*** (0.001)	0.006 (0.008)	0.003 (0.007)
Public debt (% of GDP)	0.000 (0.002)		-0.000 (0.002)		0.001 (0.001)		-0.009 (0.006)	
Fiscal- expansionary shock × public debt	-0.000 (0.000)		-0.001 (0.000)		0.000 (0.000)		0.001* (0.000)	
Government effectiveness (WGI)		0.131** (0.063)		0.281*** (0.081)		0.260** (0.106)		0.989** (0.383)
Fiscal- expansionary shock × government effectiveness		0.008 (0.007)		0.004 (0.005)		-0.006 (0.009)		-0.001 (0.047)
Observations	1,618	2,245	1,579	2,247	884	1,442	884	1,442
Number of countries	71	133	75	146	70	129	70	129
Fixed effects	Country & year	Country & year	Country & year	Country & year	Country & year	Country & year	Country & year	Country & year

Note: Joint specifications including fiscal and monetary shocks with interactions between fiscal shocks, public debt, and governance. Country and year fixed effects included in all regressions. Driscoll–Kraay standard errors (lag=3) in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 2b. Monetary Heterogeneity: Public Debt, Governance, and Private-Sector Responses

Variables	1	2	3	4	5	6	7	8
	GFCF – Debt het.	GFCF – Gov het.	Credit – Debt het.	Credit – Gov het.	Log firms – Debt het.	Log firms – Gov het.	Density – Debt het.	Density – Gov het.
Monetary-easing shock	0.031 (0.024)	-0.068*** (0.008)	-0.024 (0.046)	0.026 (0.020)	0.036 (0.063)	0.074 (0.049)	0.243 (0.311)	-0.097 (0.073)
Real GDP growth	0.021** (0.008)	0.028*** (0.005)	-0.027*** (0.006)	-0.009** (0.003)	0.016*** (0.004)	0.009* (0.004)	0.087*** (0.024)	0.064*** (0.014)
GDP deflator inflation	-0.009*** (0.001)	-0.005*** (0.001)	-0.006*** (0.002)	-0.004*** (0.001)	-0.003*** (0.001)	0.001** (0.000)	0.001 (0.004)	-0.002 (0.002)
Private bank credit (% of GDP)	0.000 (0.001)	0.001 (0.001)			0.003*** (0.001)	0.002*** (0.001)	0.013 (0.008)	0.007 (0.005)
Public debt (% of GDP)	-0.008*** (0.001)		-0.007*** (0.001)		0.001 (0.001)		-0.018** (0.007)	
Monetary-easing shock × Public debt	-0.001* (0.000)		0.000 (0.001)		-0.001 (0.001)		-0.006 (0.005)	
Government effectiveness (WGI)		0.272*** (0.059)		0.427*** (0.084)		0.223*** (0.073)		1.224*** (0.322)
Monetary-easing shock × Government effectiveness		-0.009 (0.018)		-0.078*** (0.025)		-0.063 (0.038)		-0.056 (0.096)
Observations	973	1,306	939	1,291	548	799	548	799
Number of countries	41	61	41	62	38	57	38	57
Fixed effects	Country & year	Country & year	Country & year	Country & year	Country & year	Country & year	Country & year	Country & year

Note: Joint specifications including fiscal and monetary shocks with interactions between fiscal shocks, public debt, and governance. Country and year fixed effects included in all regressions. Driscoll–Kraay standard errors (lag=3) in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Appendix Table A5 explores the joint fiscal–monetary policy stance by introducing an interaction between fiscal and monetary shocks. The results suggest the evidence of complementarities between the two policy instruments that could explain long-run private-sector outcomes is limited. Fiscal shocks are generally statistically insignificant across specifications, while monetary easing is negatively associated with private investment. For private credit, neither fiscal nor monetary shocks exhibit robust independent associations, and their interaction remains statistically insignificant. For firm creation, the interaction term is negative and weakly significant, suggesting that simultaneous fiscal and monetary expansions are not systematically associated with stronger entrepreneurial activity. Overall, the evidence provides little support for strong long-run complementarities between fiscal- and monetary-policy shocks.

The preceding analysis highlighted substantial heterogeneity in the relationship between policy shocks and private-sector outcomes. To explore this issue more formally, Tables 3a and 3b augment the baseline specifications with interaction terms that capture key structural characteristics, namely informality, inequality, and corruption. These factors may influence the environment in which fiscal and monetary

policies operate and therefore help explain cross-country differences in private-sector outcomes. Specifically, we estimate

$$y_{it} = \alpha_i + \tau_t + (\beta_1 + \beta_2 Z_{it-1})\varepsilon_{it} + \gamma' X_{it-1} + u_{it},$$

where Z_{it-1} alternatively denotes informality, inequality, or corruption. A statistically significant interaction coefficient indicates that the relationship between policy shocks and private-sector outcomes varies with the corresponding structural characteristic.

Table 3a reports the results for fiscal shocks. Overall, the evidence points to limited heterogeneity. Informality is negatively associated with baseline levels of private credit and, to a lesser extent, investment, but the interaction terms are generally insignificant. Inequality is positively associated with several private-sector outcomes in levels, although the interaction between fiscal shocks and inequality is negative for firm creation measures. Corruption is negatively associated with private credit, while the interaction between fiscal shocks and corruption is positive for some entrepreneurial outcomes. Taken together, the results suggest that structural characteristics are more strongly related to baseline levels of private-sector development than to the relationship between fiscal shocks and private-sector activity.

Table 3b presents the corresponding results for monetary shocks. Here, the evidence of heterogeneity is somewhat stronger. Informality is negatively associated with investment and credit in levels, while the interaction between monetary easing and informality is positive for investment and entrepreneurial outcomes. Inequality appears primarily relevant for the credit channel, with monetary easing displaying a weaker association with private credit in more unequal economies. Corruption also conditions some of the estimated relationships, particularly for credit and firm creation, although the direction and magnitude of these effects vary across specifications.

Overall, the results suggest that structural characteristics such as informality, inequality, and corruption help explain cross-country differences in the relationship between policy shocks and private-sector outcomes. While the evidence of heterogeneity is generally stronger for monetary than for fiscal shocks, the findings reinforce the broader conclusion that institutional and structural conditions are important correlates of private-sector development and may shape how policy shocks are associated with investment, credit, and entrepreneurial activity.

Table 3a. Informality, Inequality, and Corruption in the Long-Run Transmission of Fiscal Shocks

Variables	(1) GFCF – Informality	(2) GFCF – Inequality	(3) GFCF – Corruption	(4) Private credit – Informality	(5) Private credit – Inequality	(6) Private credit – Corruption	(7) Log new firms – Informality	(8) Log new firms – Inequality	(9) Log new firms – Corruption	(10) New firm density – Informality	(11) New firm density – Inequality	(12) New firm density – Corruption
Fiscal shock	-0.026 (0.016)	0.022 (0.127)	0.010* (0.006)	-0.016 (0.021)	-0.069 (0.140)	0.010 (0.007)	-0.038** (0.016)	0.084** (0.038)	0.004 (0.008)	-0.162 (0.117)	0.525* (0.272)	-0.007 (0.031)
Informality (share of informal GDP)	-0.036*			-0.192***			-0.025			-0.041		
	(0.019)			(0.066)			(0.018)			(0.055)		
Fiscal shock × Informality	0.001			0.000			0.002*			0.004		
	(0.001)			(0.001)			(0.001)			(0.004)		
Market-income Gini (SWIID)		0.147**			0.220***			0.005			0.100*	
		(0.059)			(0.073)			(0.007)			(0.045)	
Fiscal shock × Market-income Gini		-0.000			0.002			-0.002**			-0.013*	
		(0.003)			(0.003)			(0.001)			(0.006)	
Corruption (higher = worse)			0.001			-0.002**			0.001			0.028
			(0.001)			(0.001)			(0.001)			(0.016)
Fiscal shock × Corruption			-0.000			0.000			0.001*			0.010**
			(0.000)			(0.000)			(0.001)			(0.004)
Observations	2,183	2064	717	2049	1861	794	1057	805	613	1057	805	613
Countries	125	125	90	132	134	99	116	111	91	116	111	91
R-sq (within)	0.176	0.211	0.318	0.216	0.207	0.349	0.288	0.210	0.345	0.0848	0.0956	0.131

Note: This table reports panel estimates of the long-run effects of fiscal and monetary shocks on private investment, private credit, log of new firms, and firm density, allowing for heterogeneous transmission through informality, market-income inequality, and corruption. Each block of columns introduces one interaction term at a time. All regressions include country and year fixed effects. Real GDP growth, inflation, and private credit growth are included as control variables in all specifications but are omitted from the table for reasons of parsimony. Driscoll–Kraay standard errors (lag=3) are reported in parentheses. ***, *, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

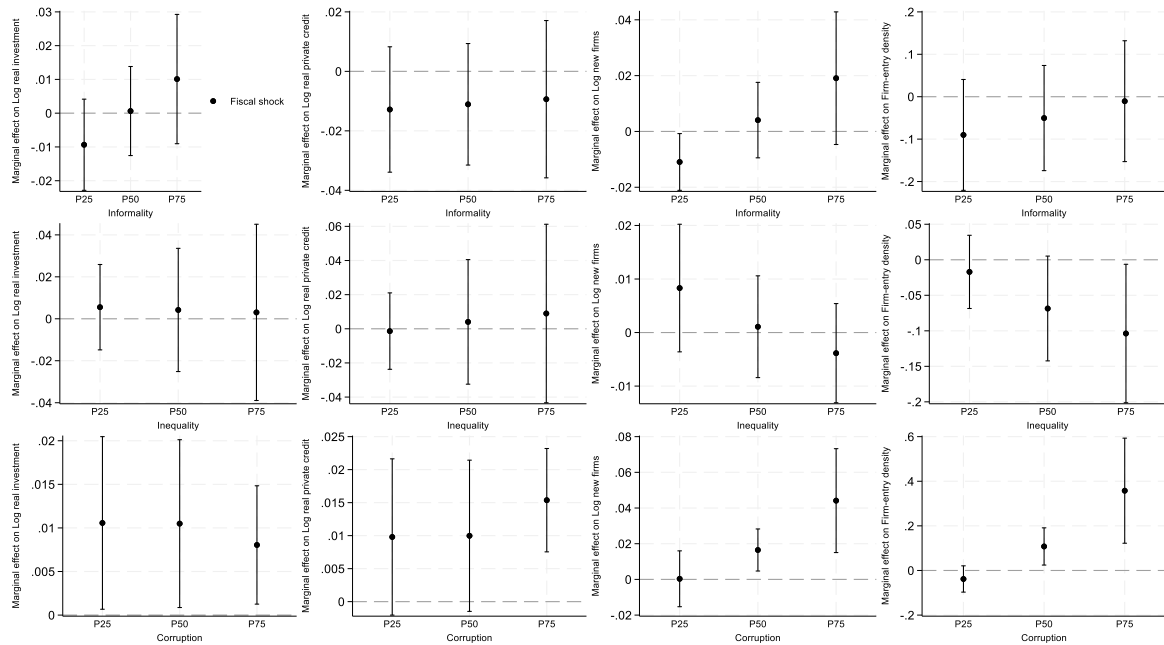
Table 3b. Informality, Inequality, and Corruption in the Long-Run Transmission of Monetary Shocks

Variables	(1) GFCF – Informality	(2) GFCF – Inequality	(3) GFCF – Corruption	(4) Private credit – Informality	(5) Private credit – Inequality	(6) Private credit – Corruption	(7) Log new firms – Informality	(8) Log new firms – Inequality	(9) Log new firms – Corruption	(10) New firm density – Informality	(11) New firm density – Inequality	(12) New firm density – Corruption
Monetary-easing shock	-0.197*	0.039	-0.007	-0.137	0.194	0.121***	-0.081***	0.019	0.160***	-1.003***	-0.130	0.048
	(0.098)	(0.091)	(0.030)	(0.100)	(0.129)	(0.018)	(0.022)	(0.124)	(0.050)	(0.194)	(0.158)	(0.066)
Informality (share of informal GDP)	-0.098***			-0.102***			-0.012			-0.066*		
	(0.009)			(0.016)			(0.019)			(0.033)		
Monetary-easing shock × Informality	0.004*			0.003			0.004***			0.028***		
	(0.002)			(0.002)			(0.001)			(0.004)		
Market-income Gini (SWIID)		0.034			0.053			-0.023			0.055	
		(0.033)			(0.042)			(0.014)			(0.068)	
Monetary-easing shock × Market- income Gini		-0.002			-0.005**			-0.001			-0.001	
		(0.002)			(0.002)			(0.002)			(0.005)	
Corruption (higher = worse)			0.006***			0.009***			0.002			0.069**
			(0.001)			(0.002)			(0.002)			(0.030)
Monetary-easing shock × Corruption			-0.001			-0.004***			-0.004***			-0.009
			(0.001)			(0.001)			(0.001)			(0.007)
Observations	1,225	1086	355	1177	1,021	371	605	502	328	605	502	328
Countries	60	61	46	61	62	47	56	57	45	56	57	45
R-sq (within)	0.281	0.247	0.336	0.365	0.327	0.335	0.342	0.264	0.512	0.116	0.0829	0.263

Note: This table reports panel estimates of the long-run effects of fiscal and monetary shocks on private investment, private credit, log of new firms, and firm density, allowing for heterogeneous transmission through informality, market-income inequality, and corruption. Each block of columns introduces one interaction term at a time. All regressions include country and year fixed effects. Real GDP growth, inflation, and private credit growth are included as control variables in all specifications but are omitted from the table for reasons of parsimony. Driscoll–Kraay standard errors (lag=3) are reported in parentheses. ***, *, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Figure 5a reports the marginal effects of fiscal shocks on private investment, private credit, firm creation, and firm density evaluated at the 25th, 50th, and 75th percentiles of informality, inequality, and corruption. For informality and inequality, the confidence intervals generally include zero across the distribution, indicating evidence is limited that these characteristics systematically modify the relationship between fiscal shocks and private-sector outcomes. In contrast, some evidence of heterogeneity emerges along the corruption dimension, particularly for entrepreneurial outcomes. The estimated relationship between fiscal shocks and firm-creation measures becomes more positive at higher levels of corruption, whereas the corresponding effects are weaker or negative at lower levels of corruption. Overall, the results suggest that the relationship between fiscal shocks and private-sector activity varies across institutional environments, although the evidence is stronger for entrepreneurial outcomes than for investment or credit.

Figure 5a. Structural Heterogeneity in the Transmission of Fiscal Shocks

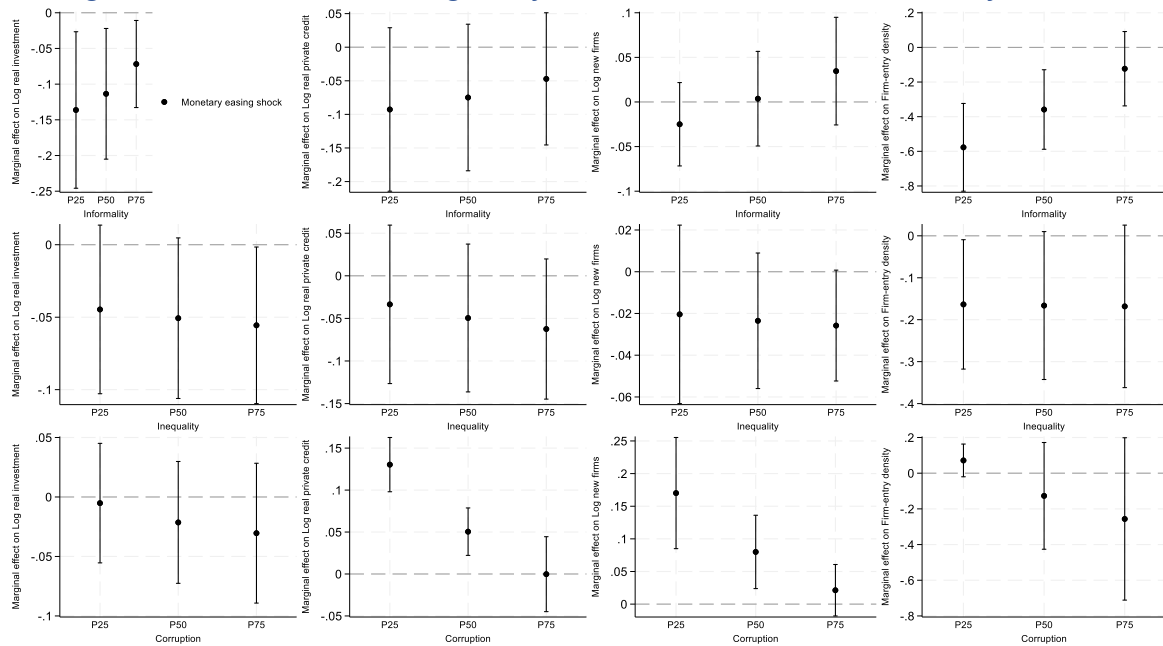


Note: The figure reports marginal effects of fiscal shocks on private investment, private credit, new firms, and firm density evaluated at the 25th, 50th, and 75th percentiles of informality, market-income inequality, and corruption. Dots denote point estimates and whiskers represent 90% confidence intervals. All specifications include country and year fixed effects and control for real GDP growth, inflation, and financial depth. Standard errors are computed using Driscoll–Kraay corrections with three lags.

Figure 5b reports the corresponding marginal effects for monetary shocks. Compared with those involving fiscal shocks, the estimated relationships are generally larger in magnitude and more precisely estimated, although they vary considerably across structural characteristics. Along the informality dimension, monetary shocks display stronger associations with investment and firm-density measures than with credit or firm creation. Along the inequality dimension, the relationship between monetary shocks and private investment and credit becomes more negative at higher levels of inequality, suggesting that monetary-policy shocks may be associated with different outcomes across countries with varying income distributions. Finally, the

corruption results indicate substantial heterogeneity in the relationship between monetary shocks and private-sector outcomes, particularly for credit and entrepreneurial activity. While the sign and magnitude of the estimated effects vary across specifications, the overall pattern reinforces the broader finding that institutional and structural characteristics are important in understanding cross-country differences in private-sector responses to monetary policy shocks.

Figure 5b. Structural Heterogeneity in the Transmission of Monetary Shocks



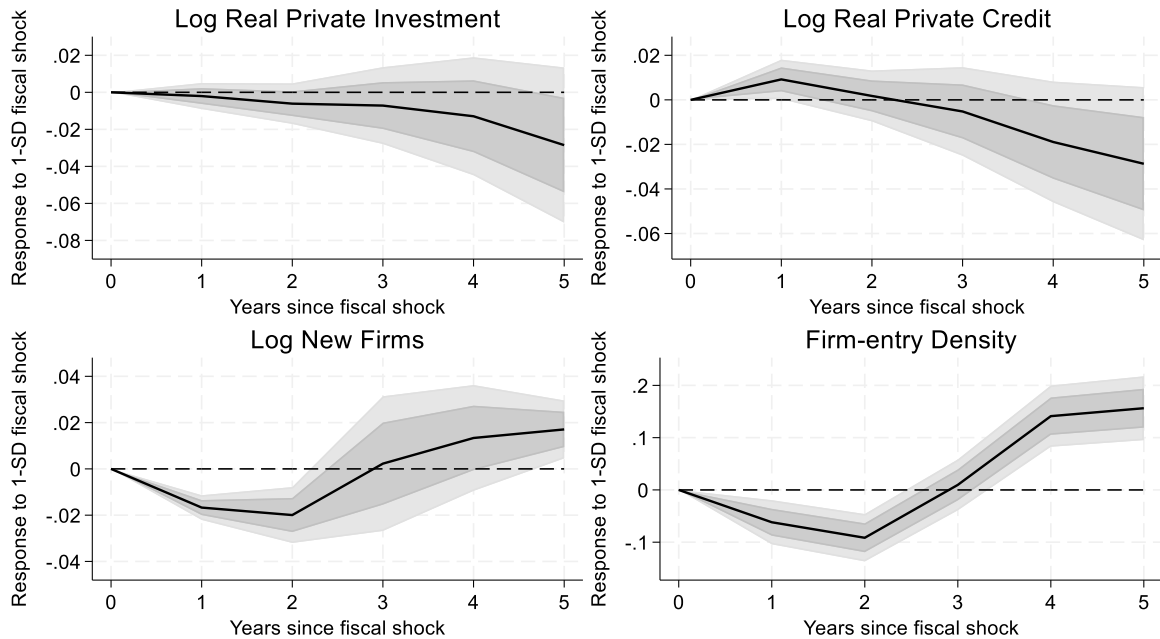
Note: The figure reports marginal effects of monetary shocks on private investment, private credit, new firms, and firm density evaluated at the 25th, 50th, and 75th percentiles of informality, market-income inequality, and corruption. Dots denote point estimates and whiskers represent 90% confidence intervals. All specifications include country and year fixed effects and control for real GDP growth, inflation, and financial depth. Standard errors are computed using Driscoll-Kraay corrections with three lags.

5.2 Short-Run Dynamics: Local Projections

To examine short- and medium-run dynamics, we estimate local projections following Jordà (2005), tracing the responses of private investment, private credit, firm creation, and firm-entry density to fiscal- and monetary-policy shocks.

Figure 6 reports the responses to a one-standard-deviation fiscal-expansion shock over a five-year horizon. Private investment displays little systematic response, with estimates remaining close to zero and statistically insignificant throughout the horizon. Private credit exhibits a short-lived positive response that fades after the first year. Entrepreneurial outcomes show a more pronounced dynamic pattern. Both the number of new firms and firm-entry density decline initially following the shock but gradually recover over time, becoming positive at longer horizons. Overall, the results suggest the short-run responses of investment and credit to fiscal expansions are limited, with somewhat stronger medium-run adjustments in entrepreneurial activity.

Figure 6. Impulse Responses of Private Investment, Credit, and Firm Dynamics to a Fiscal-Policy Expansionary Shock

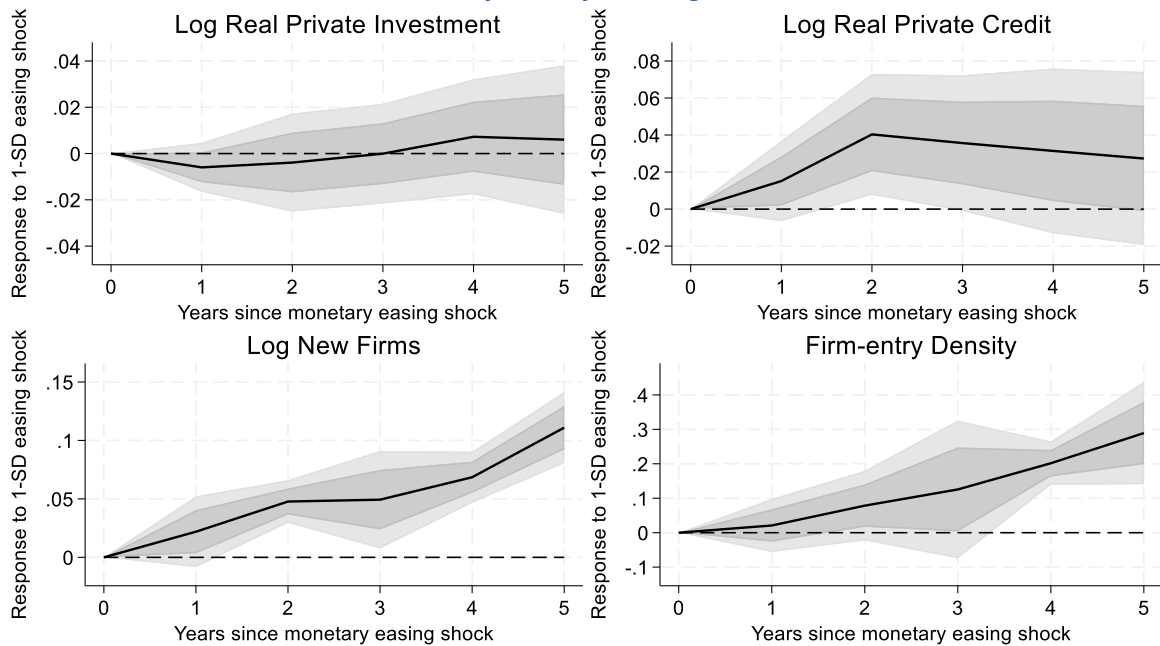


Note: This figure reports IRFs to a one-standard-deviation fiscal-policy shock, estimated using the LP method. For each horizon $h = 0, \dots, 5$, the dependent variables are projected on contemporaneous and lagged values of the fiscal-policy shock, forward values of the shock up to horizon h , and a common set of controls including real GDP growth, the GDP deflator, and private bank credit to GDP (except when private credit is the dependent variable). All specifications include country and year fixed effects. Standard errors are computed using Driscoll-Kraay corrections with a lag length of three. IRFs are scaled to reflect a one-standard-deviation monetary-policy shock. Shaded areas represent 68% and 90% confidence intervals.

Figure A1 presents the corresponding responses separately for AEs and EMDEs. While investment responses are broadly similar across country groups, greater heterogeneity emerges for private credit and firm-entry density. Credit expands temporarily in EMDEs but contracts in AEs at longer horizons. Firm-entry density also declines more noticeably in AEs, whereas responses in EMDEs remain comparatively muted. By contrast, the differences in the response of the number of new firms are generally not statistically significant.

Figure 7 reports the responses to a one-standard-deviation monetary-easing shock. Unlike fiscal shocks, monetary easing is associated with a clear short-run expansion in private credit that persists for approximately two years before gradually dissipating. Private investment again shows little systematic response. Entrepreneurial outcomes display the strongest dynamics, with both firm creation and firm-entry density increasing significantly following monetary easing and remaining positive over much of the projection horizon. These results indicate that monetary shocks are more strongly associated with credit and entrepreneurial activity than with aggregate investment.

Figure 7. Impulse Responses of Private Investment, Credit, and Firm Dynamics to a Monetary-Policy-Easing Shock



Note: This figure reports IRFs to a one-standard-deviation monetary-policy shock, estimated using the LP method. For each horizon $h = 0, \dots, 5$, the dependent variables are projected on contemporaneous and lagged values of the monetary-policy shock, forward values of the shock up to horizon h , and a common set of controls including real GDP growth, the GDP deflator, and private bank credit to GDP (except when private credit is the dependent variable). All specifications include country and year fixed effects. Standard errors are computed using Driscoll-Kraay corrections with a lag length of three. IRFs are scaled to reflect a one-standard-deviation monetary-policy shock. Shaded areas represent 68% and 90% confidence intervals.

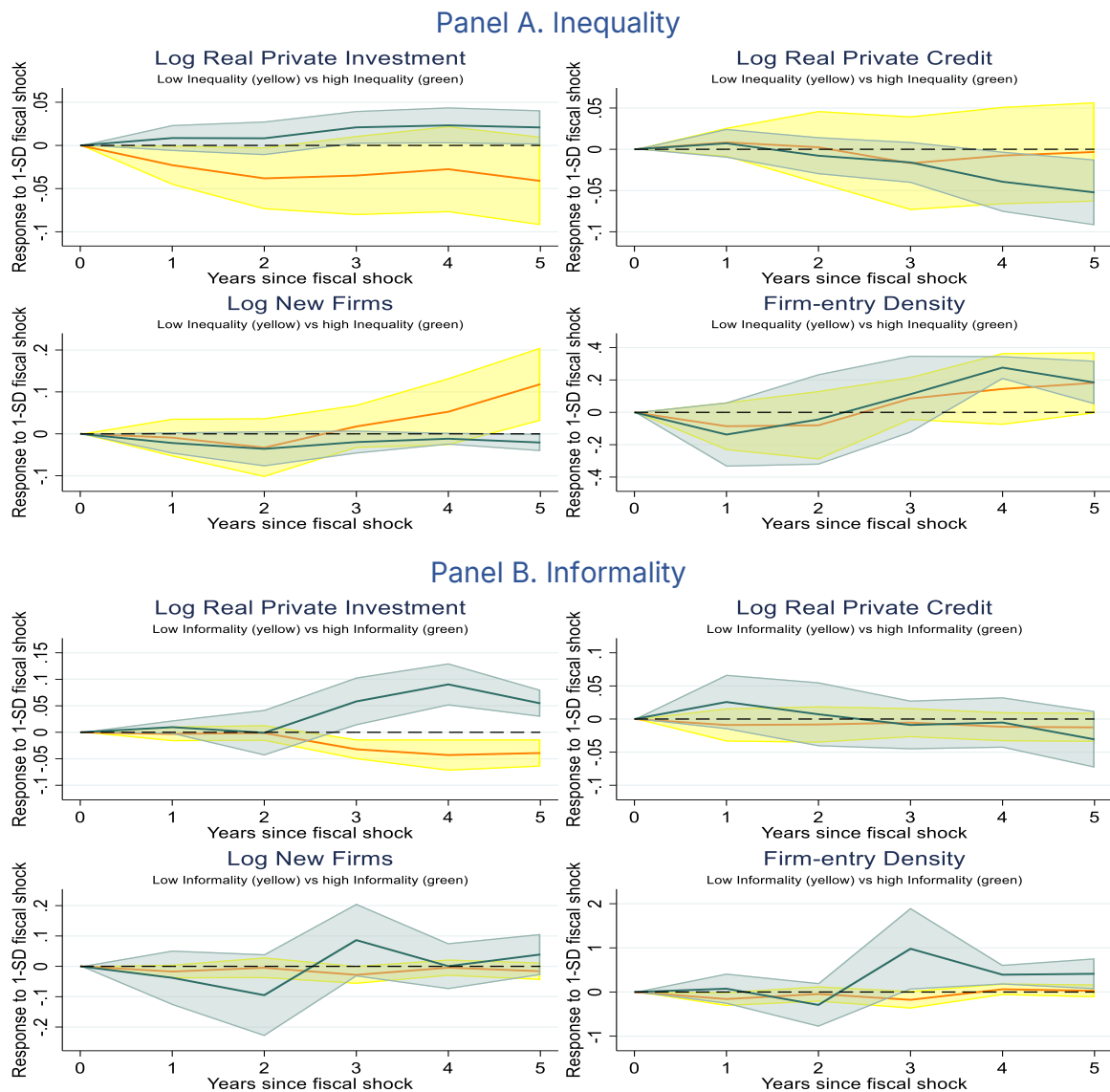
Figure A2 reports the responses separately for AEs and EMDEs. The results reveal notable differences in the responses of investment and credit. Investment rises in AEs following monetary easing but declines modestly in EMDEs, while credit expansion is stronger in EMDEs than in AEs. In contrast, entrepreneurial outcomes are remarkably similar across country groups, with confidence intervals largely overlapping throughout the projection horizon. Overall, the findings suggest that the relationship between monetary-policy shocks and private-sector outcomes differs across levels of economic and financial development, particularly for investment and credit.

5.3 Nonlinearities and State Dependence

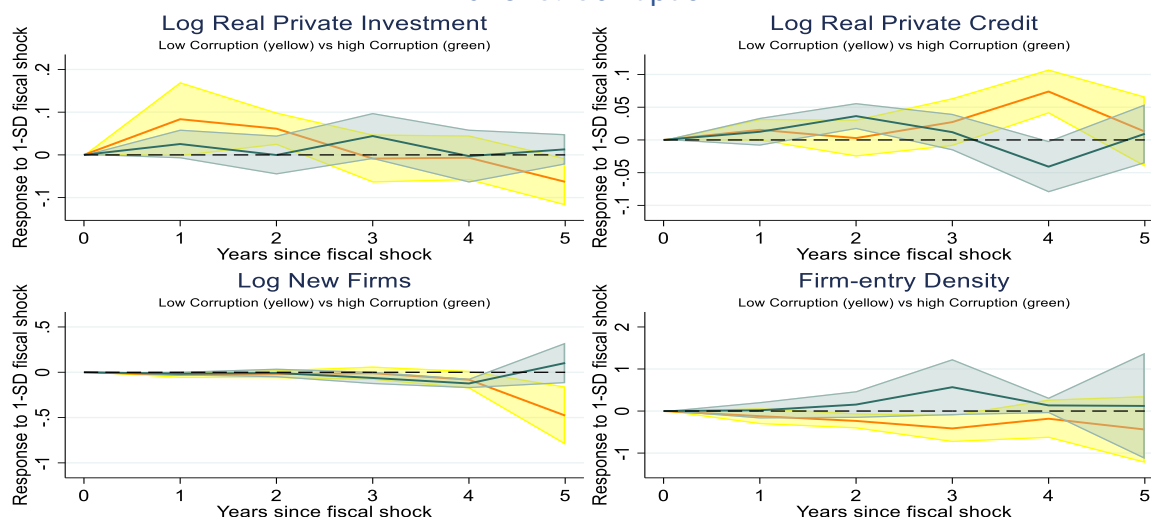
The previous results suggest that the relationship between policy shocks and private-sector outcomes may vary across countries with different structural characteristics. To explore this possibility, we estimate smooth-transition local projections (STAR-LPs) that allow impulse responses to vary continuously with informality, inequality, and corruption. Rather than imposing discrete regimes, this approach allows responses to evolve gradually across the distribution of the conditioning variable while preserving the full cross-sectional variation in the data.

Figure 8a reports state-dependent responses to a one-standard-deviation fiscal-expansion shock. Overall, evidence of state dependence is limited. Across most outcomes and conditioning variables, confidence intervals overlap substantially, indicating relatively similar responses across low- and high-state environments. The clearest differences emerge for private investment. Fiscal expansions are associated with weaker investment responses in low-informality and low-inequality environments, while responses become somewhat more positive in high-informality and high-inequality settings. However, these differences are generally modest and often imprecisely estimated. For private credit, firm creation, and firm-entry density, the responses are broadly similar across states, which translates into the evidence's being limited that informality, inequality, or corruption systematically alter the dynamic relationship between fiscal shocks and private-sector outcomes.

Figure 8a. State-Dependent IRFs of Private Investment, Credit, and Firm Dynamics to Fiscal Policy Expansionary Shocks



Panel C. Corruption

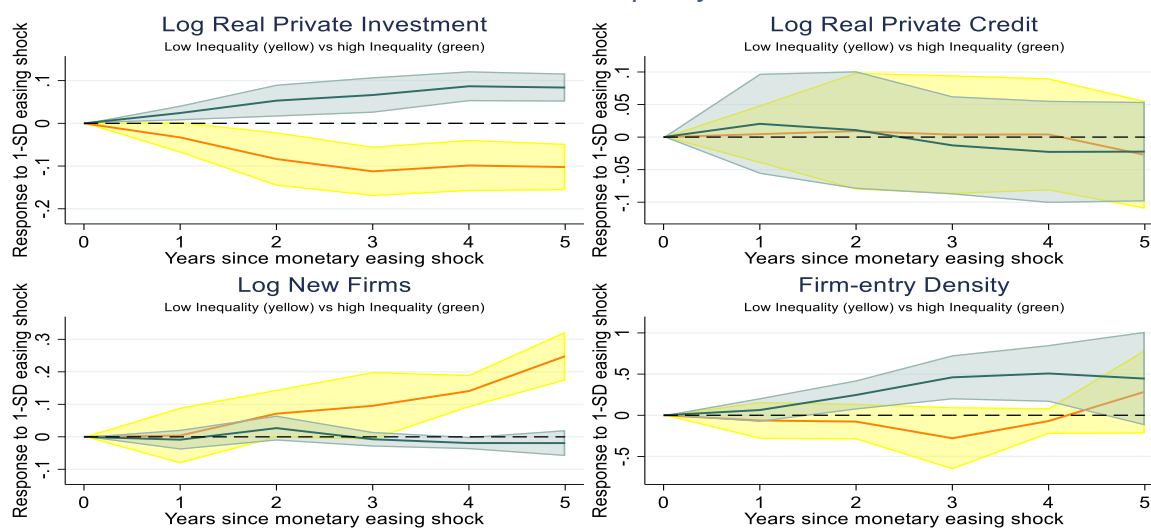


Note: This figure reports STAR-LP impulse responses to a one-standard-deviation fiscal-policy shock, conditioning on income inequality, informality, and corruption. For each conditioning variable, the yellow line and band correspond to low- Z states and the green line and band to high- states, where Z denotes the respective structural characteristic. Shaded areas denote 90% confidence intervals based on Driscoll-Kraay standard errors. Responses are scaled to a one-standard-deviation monetary shock.

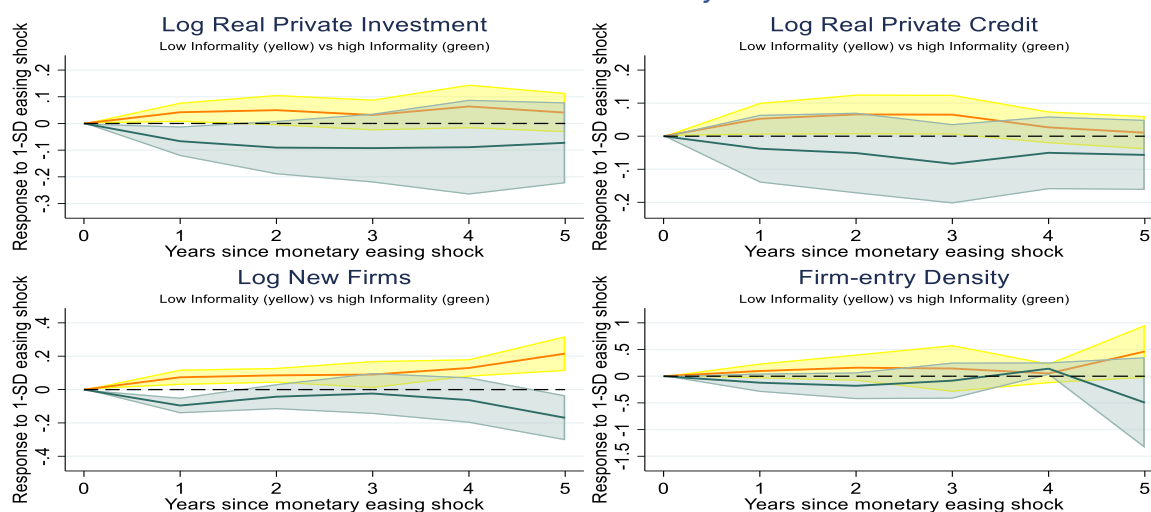
Figure 8b presents the corresponding results for monetary-easing shocks. Compared with fiscal shocks, the evidence of state dependence is somewhat stronger. Along the inequality dimension, investment responses differ more noticeably across states, with more-positive responses observed in high-inequality environments. Entrepreneurial outcomes also display some heterogeneity, although the magnitude and statistical significance of these differences vary across horizons and measures. Conditioning on informality reveals stronger responses of firm creation in low-informality environments, whereas responses are weaker and less precisely estimated when informality is high. By contrast, conditioning on corruption produces relatively limited differences, with confidence intervals for high- and low-corruption states overlapping across most outcomes and horizons. Overall, the results suggest that inequality and informality are more closely associated with heterogeneity in monetary-policy responses than is corruption.

Figure 8b. State-Dependent IRFs of Private Investment, Credit, and Firm Dynamics to Monetary-Policy Easing Shocks

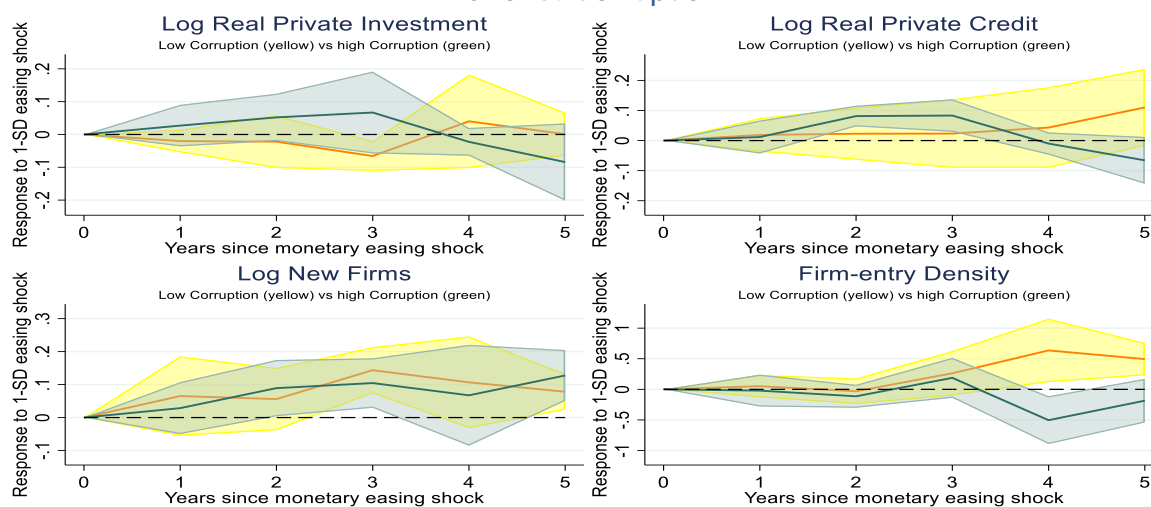
Panel A. Inequality



Panel B. Informality



Panel C. Corruption



Note: This figure reports STAR-LP impulse responses to a one-standard-deviation monetary-policy shock, conditioning on income inequality, informality, and corruption. For each conditioning variable, the yellow line and band correspond to low- Z states and the green line and band to high- Z states, where Z denotes the respective structural characteristic. Shaded areas denote 90% confidence intervals based on Driscoll–Kraay standard errors. Responses are scaled to a one-standard-deviation monetary shock.

Taken together, the STAR-LP results reinforce the broader conclusion that average responses often mask important cross-country heterogeneity. At the same time, the evidence indicates that such heterogeneity is generally more pronounced for monetary than for fiscal shocks, and that inequality and informality appear more relevant than corruption in explaining differences in dynamic private-sector responses.

5.4 Robustness, Sensitivity, and Identification Tests

This section reports an extensive battery of robustness, sensitivity, and identification checks designed to validate the empirical strategy and assess the stability of the baseline findings. Overall, the evidence consistently confirms the credibility of the identified fiscal and monetary shocks and strongly supports the main conclusions of the paper. The robustness protocol closely follows the validation strategies commonly employed in narrative and defense-spending shock frameworks, adapted here to aggregate fiscal- and monetary-policy innovations with explicit state dependence.

5.4.1 Shock Exogeneity, Asymmetry, and Orthogonality

We implement three complementary diagnostic exercises to evaluate the plausibility of the identification strategy.

First, we explicitly distinguish between fiscal expansions and fiscal consolidations, as well as between monetary-easing and monetary-tightening episodes. This allows us to assess whether the estimated responses are driven by directional asymmetries rather than symmetric average effects. The resulting impulse responses closely mirror those obtained from the baseline STAR-LP specifications. In particular, the asymmetric estimates confirm that nonlinearities operate primarily along the extensive margin of firm dynamics and credit transmission, which is fully consistent with the main results.

Second, to mitigate potential collinearity between macroaggregates and to express outcomes in economically interpretable terms, we rescale investment and credit variables by lagged GDP. The corresponding impulse responses remain both quantitatively and qualitatively indistinguishable from those obtained using log-level specifications, confirming that the baseline findings are not driven by scale effects or functional form assumptions.

Third, we formally test the orthogonality of the identified shocks to the business cycle. Fiscal shocks, constructed from cyclically adjusted expenditure innovations, are orthogonal to contemporaneous macroeconomic conditions by construction. Monetary shocks, defined as forecast errors in inflation and output expectations, are similarly purged of systematic macroeconomic components. Consistent with this design, formal correlation tests reveal no statistically significant relationship between

either class of shocks and contemporaneous GDP growth, inflation, or interest rates. These results strongly support the exogeneity of the identified policy innovations.

5.4.2 Foresight (Placebo) Tests

To further rule out anticipatory effects, we conduct placebo (foresight) tests by augmenting the local projection equations with leads of fiscal and monetary shocks, including their STAR-weighted components. Across all horizons, future policy shocks do not predict current private-sector outcomes once overlapping-horizon corrections are applied. These null effects are highly robust and provide strong evidence against foresight or pretrends. This reinforces the interpretation of the identified fiscal and monetary innovations as genuinely unanticipated at the annual frequency.

5.4.3 Alternative Fiscal-Shock Definitions and Threshold Robustness

We next assess the sensitivity of the results to alternative constructions of fiscal shocks. Specifically, we consider (1) shocks derived from cyclically adjusted primary balances (CAPB) instead of expenditure-based measures; (2) alternative filtering methods used to compute cyclically adjusted components, including the HP filter ($\lambda=6.25$) and the Hamilton filter ($h=8$); and (3) alternative thresholds for defining large fiscal episodes (± 1.5 , ± 2.0 , and ± 3.0 standard deviations). Across all specifications, both the baseline semielasticities and the nonlinear state-dependent coefficients remain tightly clustered around the benchmark estimates and well within the one-standard-error band. These findings demonstrate that the main fiscal results are highly robust to the choice of fiscal instrument, filtering methodology, and episode definition. For monetary shocks, we additionally winsorize the forecast-error distribution at the 1st and 99th percentiles to remove extreme crisis-driven outliers. The resulting impulse responses remain virtually unchanged, with both $\beta_h^{(M,0)}$ and $\beta_h^{(M,1)}$ exhibiting remarkable stability. This confirms that the monetary transmission results are not driven by tail events or extreme observations.

5.4.4 Alternative Sets of Controls

Finally, we examine the sensitivity of the results to alternative sets of conditioning information. We estimate a wide range of specifications, ranging from a parsimonious model that includes only the output gap and inflation to richer specifications that additionally incorporate financial depth, terms of trade, and other macrofinancial controls. For each specification, we reestimate the local projections and recover the total state-dependent responses at each horizon. The distribution of estimated coefficients is summarized using box-and-whisker plots for horizons one to five. Across all horizons, the interquartile ranges are narrow and tightly centered around the baseline responses. This indicates a high degree of stability of both the baseline and nonlinear transmission coefficients across alternative macroeconomic environments.

6. Conclusion and Policy Implications

This paper examined the relationship between fiscal- and monetary-policy shocks and private-sector outcomes, focusing on private investment, private credit, and firm creation. Using a panel of up to 148 countries over the period 1970–2023, we constructed measures of cyclically adjusted fiscal shocks and forecast-error monetary shocks and analyzed their association with private-sector activity through a combination of long-run panel regressions and state-dependent local projections. The analysis was motivated by the observation that although fiscal and monetary policy have been extensively studied in relation to aggregate macroeconomic outcomes, less is known about how shocks driven by these types of policy relate to key dimensions of private-sector development in a broad cross-country setting.

The results point to a consistent pattern. On average, long-run relationships between fiscal- and monetary-policy shocks and private-sector outcomes are generally weak and often statistically insignificant. Fiscal expansions are not systematically associated with stronger long-run investment, credit growth, or firm creation, while the relationship between monetary easing and long-run private-sector activity also appears weak. These findings suggest that any positive associations between macroeconomic policy and private-sector outcomes may be offset over time by factors such as debt dynamics, expectations, financial frictions, institutional constraints, or broader macroeconomic conditions.

At the same time, the analysis reveals substantial heterogeneity across countries and policy environments. Fiscal expansions tend to be more strongly associated with private-sector activity in countries characterized by lower public debt and stronger institutional quality, whereas monetary easing is more closely associated with firm creation and credit growth in financially constrained and highly informal economies. Conversely, these relationships appear weaker in environments characterized by high debt burdens, weaker governance, or limited financial development. Dynamic estimates further indicate that monetary tightening is associated with relatively rapid and persistent declines in private investment and private credit, while the relationship between fiscal shocks and private-sector outcomes appears more asymmetric and dependent on institutional and macroeconomic conditions.

More broadly, the findings are consistent with the view that structural and institutional characteristics play an important role in shaping the relationship between macroeconomic policy and private-sector development. Fiscal space, governance quality, financial depth, and the degree of informality appear to influence the extent to which policy shocks are associated with investment, credit, and entrepreneurial activity. As a result, similar policy interventions may be associated with markedly different outcomes across countries depending on their underlying economic and institutional environments.

The results also suggest that fiscal and monetary policy should not be evaluated in isolation from broader structural conditions. In countries with stronger institutions, deeper financial systems, and more-sustainable fiscal positions, policy shocks tend to be associated with more-favorable private-sector responses. In contrast, in environments characterized by weaker institutions, limited fiscal space, or

underdeveloped financial markets, the relationship between policy interventions and private-sector outcomes appears considerably weaker. These findings underscore the importance of complementing macroeconomic stabilization policies with reforms that strengthen institutions, improve governance, deepen financial markets, and support private-sector development.

Several limitations should be acknowledged. First, although the analysis covers a large number of countries over a long-time horizon, data availability varied across outcomes and specifications, particularly for firm-level measures, reducing sample size in some exercises. Second, while the shock measures are designed to capture large discretionary policy movements in a comparable cross-country framework, they should not be interpreted as narrative or action-based policy shocks. Consequently, the findings are best viewed as evidence on the relationship between identified policy shocks and private-sector outcomes rather than definitive causal estimates. Third, the analysis relies on aggregate indicators of private-sector activity and therefore cannot fully capture firm-level heterogeneity, resource reallocation effects, or distributional consequences within countries.

These limitations suggest several avenues for future research. First, linking policy shocks to firm-level and establishment-level data sets could provide richer evidence on investment behavior, firm dynamics, productivity, and business survival. Second, incorporating more-detailed measures of financial conditions and banking-sector characteristics may help clarify the channels through which fiscal and monetary shocks are associated with private-sector outcomes. Third, future work could explore how institutional reforms, fiscal frameworks, and monetary-policy regimes influence the relationship between policy shocks and private-sector development. Finally, the examination of the interaction between macroeconomic policy, climate-related shocks, and structural transformation represents a promising area for future investigation.

Overall, the analysis suggests that the relationship between fiscal- and monetary-policy shocks and private-sector outcomes is highly heterogeneous across countries and institutional settings. While the average long-run relationships are generally weak, important differences emerge depending on fiscal space, financial development, governance, and informality. These findings highlight the importance of considering structural and institutional conditions when evaluating the potential role of macroeconomic policy in shaping private-sector development.

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Appendix A

Table A1. Country List

United States, United Kingdom, Austria, Belgium, Denmark, France, Germany, San Marino, Italy, Luxembourg, Netherlands, Norway, Sweden, Switzerland, Canada, Japan, Finland, Greece, Iceland, Ireland, Malta, Türkiye, Australia, New Zealand, South Africa, Chile, Colombia, Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Paraguay, Peru, Uruguay, Bahamas, Barbados, Belize, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Trinidad and Tobago, Arab Republic of Egypt, Bahrain, Cyprus, Israel, Jordan, Lebanon, West Bank and Gaza, Afghanistan, Bangladesh, Bhutan, Cambodia, Sri Lanka, India, Lao PDR, Malaysia, Maldives, Palau, Philippines, Republic of Korea, Singapore, Thailand, Angola, Botswana, Cabo Verde, Central African Republic, Democratic Republic of Congo, Equatorial Guinea, Ethiopia, Ghana, Cote d'Ivoire, Lesotho, Madagascar, Malawi, Mali, Mauritius, Morocco, Zimbabwe, Namibia, Republic of Congo, Sudan, Eswatini, Tanzania, Togo, Tunisia, Burkina Faso, Zambia, Federated States of Micronesia, Fiji, Vanuatu, Marshall Islands, Armenia, Azerbaijan, Belarus, Georgia, Bulgaria, Moldova, Russian Federation, Ukraine, Czechia, Slovak Republic, Estonia, Latvia, Serbia, Hungary, Lithuania, Mongolia, Croatia, Slovenia, North Macedonia, Bosnia and Herzegovina, Poland, Romania.

Table A2. Summary Statistics

Variable	Obs.	Mean	Std. Dev.	Min	P25	Median	P75	Max
Fiscal expansion shock (ε^F ,+)	3,976	0.45	1.45	0	0	0	0	26.48
Public debt (% of GDP)	3,080	53.23	35.86	0.74	29.39	45.65	68.46	327.72
Government effectiveness (WGI)	4,730	-0.06	0.98	-2.44	-0.78	-0.20	0.59	2.47
GDP growth (%)	9,362	3.52	6.79	- 64.05	1.12	3.71	6.19	149.97
GDP deflator (index)	9,414	167.90	5,104.45	0	16.86	55.56	97.17	462,510.9
Private credit (% of GDP)	7,853	37.37	35.46	0	13.08	26.10	49.60	304.58

Table A3. Panel Regressions: Fiscal and Monetary Shocks in Advanced Economies

Variables	(1) Log real GFCF – fiscal only	(2) Log real GFCF – monetary only	(3) Log real GFCF – fiscal & monetary	(4) Log real credit – fiscal only	(5) Log real credit – monetary only	(6) Log real credit – fiscal & monetary	(7) Log new firms – fiscal only	(8) Log new firms – monetary only	(9) Log new firms – fiscal & monetary	(10) Firm density – fiscal only	(11) Firm density – monetary only	(12) Firm density – fiscal & monetary
Fiscal-expansionary shock	0.046 (0.040)		-0.002 (0.006)	0.059 (0.042)		0.005 (0.009)	-0.006 (0.012)		-0.002 (0.010)	-0.078 (0.086)		-0.064 (0.089)
Monetary-easing shock		-0.058*** (0.020)	-0.053*** (0.019)		-0.096* (0.056)	-0.086 (0.055)		-0.059** (0.024)	-0.057** (0.026)		-0.218 (0.210)	-0.014 (0.219)
Real GDP growth (<i>t</i> -1)	0.019* (0.010)	0.028*** (0.008)	0.027*** (0.008)	-0.022* (0.012)	-0.022*** (0.006)	-0.021*** (0.005)	0.019*** (0.005)	0.020*** (0.005)	0.018*** (0.005)	0.185*** (0.038)	0.173*** (0.046)	0.159*** (0.041)
GDP deflator inflation (<i>t</i> -1)	-0.027*** (0.010)	0.003** (0.001)	0.001 (0.001)	-0.024** (0.009)	0.005** (0.003)	0.002 (0.003)	-0.008*** (0.002)	-0.012*** (0.002)	-0.012*** (0.003)	0.133*** (0.035)	0.032 (0.027)	0.055 (0.039)
Private bank credit (% of GDP) (<i>t</i> -1)	0.002* (0.001)	0.000 (0.001)	-0.000 (0.001)				0.002** (0.001)	0.001** (0.000)	0.001* (0.001)	0.021* (0.010)	0.010* (0.006)	0.014 (0.010)
Observations	1,016	796	709	957	762	685	455	425	399	455	425	399
Number of groups	34	31	30	34	31	30	32	29	28	32	29	28
Fixed effects	Country & year	Country & year	Country & year	Country & year	Country & year	Country & year	Country & year	Country & year	Country & year	Country & year	Country & year	Country & year

Note: The dependent variables are log of real private investment, log of real private credit, log of new firms, and firm density. Country and year fixed effects included in all specifications. Driscoll–Kraay standard errors (lag=3) in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A4. Panel Regressions: Fiscal and Monetary Shocks in Emerging Markets and Developing Economies

Variables	(1) Log real GFCF – fiscal only	(2) Log real GFCF – monetary only	(3) Log real GFCF – fiscal & monetary	(4) Log real credit – fiscal only	(5) Log real credit – monetary only	(6) Log real credit – fiscal & monetary	(7) Log new firms – fiscal only	(8) Log new firms – monetary only	(9) Log new firms – fiscal & monetary	(10) Firm density – fiscal only	(11) Firm density – monetary only	(12) Firm density – fiscal & monetary
Fiscal-expansionary shock	0.007 (0.018)		-0.005 (0.011)	-0.027 (0.031)		-0.001 (0.011)	0.004 (0.008)		0.001 (0.008)	0.024 (0.031)		-0.004 (0.036)
Monetary-easing shock		-0.057* (0.029)	-0.042* (0.021)		-0.008 (0.057)	0.045 (0.033)		0.101* (0.056)	0.022 (0.038)		0.041 (0.072)	0.066 (0.091)
Real GDP growth (<i>t</i> -1)	0.009 (0.010)	0.019** (0.009)	0.039*** (0.010)	-0.031* (0.017)	-0.012*** (0.003)	0.007 (0.007)	0.007** (0.003)	0.003 (0.003)	0.006 (0.004)	0.012 (0.010)	0.012 (0.009)	0.019 (0.015)
GDP deflator inflation (<i>t</i> -1)	-0.001*** (0.000)	-0.007*** (0.002)	-0.008*** (0.002)	-0.001*** (0.000)	-0.011*** (0.002)	-0.012*** (0.001)	0.001* (0.000)	-0.000 (0.001)	0.002*** (0.000)	0.001 (0.001)	0.000 (0.001)	0.005* (0.003)
Private bank credit (% of GDP) (<i>t</i> -1)	0.024*** (0.006)	0.013*** (0.003)	0.005 (0.003)				0.007*** (0.001)	0.005** (0.002)	0.010*** (0.002)	0.006 (0.004)	0.040*** (0.006)	0.038*** (0.006)
Observations	2,115	715	477	1,970	709	446	987	374	284	987	374	284
Number of groups	100	30	25	113	31	26	97	28	22	97	28	22
Fixed effects	Country & year	Country & year	Country & year	Country & year	Country & year	Country & year	Country & year	Country & year	Country & year	Country & year	Country & year	Country & year

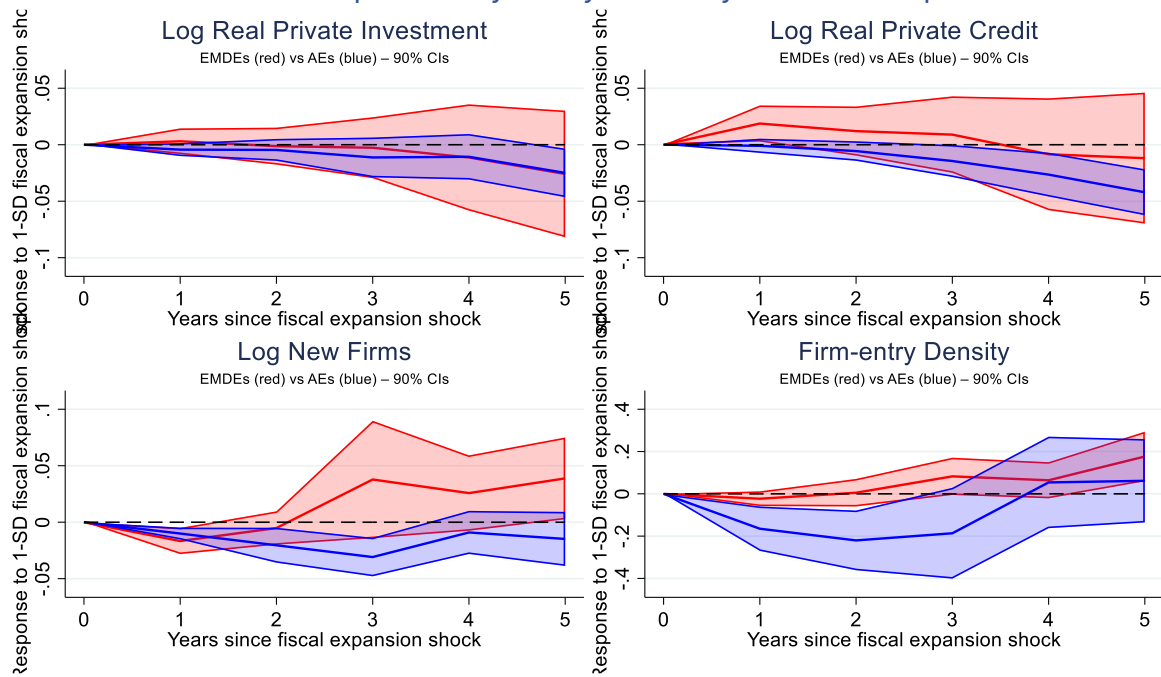
Note: The dependent variables are log of real private investment, log of real private credit, log of new firms, and firm density. Country and year fixed effects included in all specifications. Driscoll–Kraay standard errors (lag=3) in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A5. Joint Fiscal–Monetary Policy Stance and Long-Run Private-Sector Outcomes

Variables	GFCF (% GDP) – joint stance	Private credit (% GDP) – joint stance	Log new firms – joint stance	New firm density – joint stance
Real GDP growth	0.034*** (0.005)	-0.009* (0.005)	0.011*** (0.003)	0.077*** (0.022)
GDP deflator inflation	-0.007*** (0.001)	-0.007*** (0.001)	0.001 (0.001)	0.004* (0.002)
Private bank credit (% of GDP)	0.001 (0.001)		0.003*** (0.001)	0.011 (0.009)
Fiscal-expansionary shock	-0.005 (0.009)	-0.004 (0.006)	-0.002 (0.008)	-0.053 (0.064)
Monetary-easing shock	-0.050*** (0.016)	-0.008 (0.033)	0.012 (0.031)	0.025 (0.129)
Fiscal-expansionary shock × Monetary- easing shock	0.017 (0.013)	0.019 (0.018)	-0.029* (0.014)	-0.119 (0.086)
Observations	1,186	1,131	683	683
Number of countries	55	56	50	50
Fixed effects	Country & year	Country & year	Country & year	Country & year
R-sq (within)	0.164	0.347	0.474	0.315

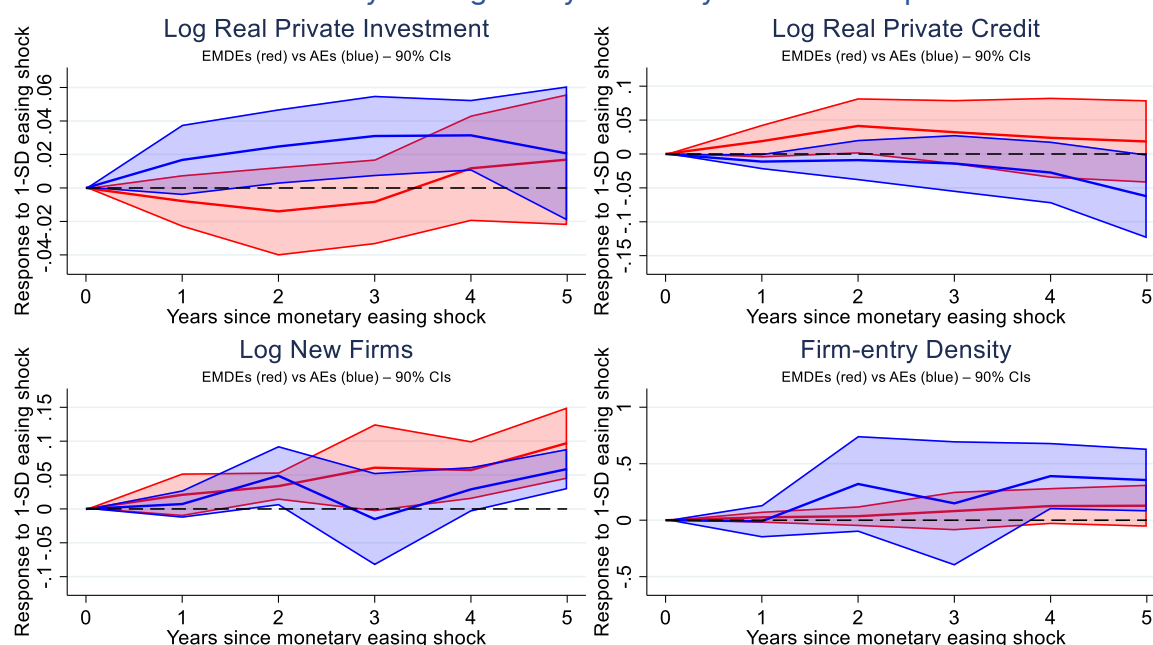
Note: The dependent variables are log of real private investment, log of real private credit, and firm creation. Country and year fixed effects included in all specifications. Driscoll–Kraay standard errors (lag=3) in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.

Figure A1. Impulse Responses of Private Investment, Credit, and Firm Dynamics to a Fiscal-Expansionary Policy Shock by Income Group



Note: This figure reports IRFs to a one-standard-deviation fiscal policy shock, estimated using the LP method. For each horizon $h = 0, \dots, 5$, the dependent variables are projected on contemporaneous and lagged values of the fiscal policy shock, forward values of the shock up to horizon h , and a common set of controls including real GDP growth, the GDP deflator, and private bank credit to GDP (except when private credit is the dependent variable). All specifications include country and year fixed effects. Standard errors are computed using Driscoll–Kraay corrections with a lag length of three. IRFs are scaled to reflect a one-standard-deviation monetary-policy shock. Shaded areas represent 68% and 90% confidence intervals.

Figure A2. Impulse Responses of Private Investment, Credit, and Firm Dynamics to a Monetary-Easing Policy Shock by Income Group



Note: This figure reports IRFs to a one-standard-deviation monetary-policy shock, estimated using the LP method. For each horizon $h = 0, \dots, 5$, the dependent variables are projected on contemporaneous and lagged values of the monetary policy shock, forward values of the shock up to horizon h , and a common set of controls including real GDP growth, the GDP deflator, and private bank credit to GDP (except when private credit is the dependent variable). All specifications include country and year fixed effects. Standard errors are computed using Driscoll-Kraay corrections with a lag length of three. IRFs are scaled to reflect a one-standard-deviation monetary-policy shock. Shaded areas represent 68% and 90% confidence intervals.