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# Determinants of Domestic Sovereign Bond Yields: Fiscal Policy and the Sovereign–Bank Nexus in Emerging Market and Developing Economies

**Manabu Nose**

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Institute for Economic Studies, Keio University
2-15-45 Mita, Minato-ku, Tokyo 108-8345, Japan
ies-office@adst.keio.ac.jp
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Manabu Nose
Keio University, Faculty of Economics
mnose@keio.jp

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# Determinants of Domestic Sovereign Bond Yields: Fiscal Policy and the Sovereign–Bank Nexus in Emerging Market and Developing Economies*

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†Keio University. Faculty of Economics. Email: mnose@keio.jp

# 1 Introduction

Global public debt remains elevated, and financing costs have risen with persistently high yields. IMF (2025a) projects that under an adverse scenario, global public debt could reach about 117 percent of GDP by 2027 (95th percentile of the debt-at-risk distribution), underscoring substantial upside risks to indebtedness (Furceri *et al.* (2025a)). Tighter global financial conditions, heightened market volatility, and geoeconomic uncertainty have reinforced these vulnerabilities, especially for Emerging Market and Developing Economies (EMDEs) with large financing needs and limited buffers. The IMF's recent studies underscore that growth prospects remain fragile and financial stability risks elevated, with accumulating public debt and the rising role of domestic sovereign bond market in meeting debt and financing challenges (IMF (2025b); IMF (2025d)).

Over the past two decades, many EMDEs have shifted toward domestic debt financing, supported by the expansion of local debt markets that provide a viable alternative to mitigate currency risks under tight external financing conditions. At the same time, creditor composition has shifted notably, with domestic banks holding a larger share of sovereign issuance. The shift toward resident buyers accelerated during the COVID-19 pandemic when governments met financing pressures through domestic bonds absorbed predominantly by domestic banks. This structural shift has provided short-term resilience to global shocks by reducing the risks stemming from both "original sin" (currency mismatch) and "original sin redux" (nonresident outflows). Yet, limited domestic absorption capacity and excessive concentration of sovereign holdings in the banking system have heightened the risk of fiscal–financial feedback loops in EMDEs (IMF (2025b); IMF (2025c)). The sovereign-bank nexus (elevated leverage and sovereign exposures of both banks and non-bank financial institutions) deepens, whereby sovereign stress can feed back into bank balance sheets, amplifying fiscal slippages into destabilizing 'doom loops'.

Under these vulnerabilities, recent evidence suggests that domestic bond yields in EMDEs have become more sensitive to fiscal fundamentals (Bolhuis *et al.* (2024)). Fitch's *Global Sovereign Outlook* (January 2025) emphasizes that elevated yields in many EMDEs reflect persistent concerns about fiscal sustainability and refinancing risks, with investors demanding higher risk premia against large financing needs and weak fiscal transparency. Taken together, today's elevated debt-servicing costs are tightly intertwined with fiscal–financial vulnerabilities. Against this backdrop, this paper examines how fiscal policy expectations affect domestic sovereign bond yields, and whether this effect is moderated

or amplified depending on who holds debt.

Empirical studies examining the determinants of domestic sovereign bond yields, particularly in relation to fiscal policy, have been limited, with a predominant focus on advanced economies and large emerging markets. Laubach (2009) shows that a percentage-point increase in expected deficits raises long-term forward rates by 20-30 basis points.[1] Laubach's identification approach has been applied to related studies for emerging markets (Jaramillo and Weber (2013); Gadanecz *et al.* (2018)), Japan (Ichiue and Shimizu (2015)), and the U.S.(Furceri *et al.* (2025b)). Recent studies suggest that the composition of sovereign debt investors influences yield behavior: greater home bias (high bank holdings) can raise borrowing costs under high debt or stress, whereas higher foreign investor participation may reduce yields but increase yield volatility.[2] In addition, a related strand of research emphasizes sovereign-bank nexus, where fiscal slippages and banking sector stress reinforce each other through direct and indirect channels.[3] Yet, despite these insights, no empirical study has systematically analyzed how fiscal policy expectations and debt holder composition jointly shape local bond yields across a broad set of EMDEs, especially after the COVID-19.

This paper fills this gap by constructing a novel panel dataset of domestic bond yields and external spreads for 75 EMDEs at a semiannual frequency over 2010-2023, including low-income nations. Using Local Projection (LP) method, impulse responses of domestic bond yields to fiscal policy are estimated and compared with the sensitivity of external bond spreads. To mitigate potential endogeneity, forecast-based measures of fiscal stance are employed, following Laubach (2009)'s approach, by relating yields of different maturities (5-year and 10-year) to forecasts of the primary fiscal deficits. Heterogeneity in fiscal sensitivity by investor composition is then analyzed using a Kitagawa-Blinder-Oaxaca (KBO) decomposition (Fortin *et al.* (2011); Cloyne *et al.* (2023)). Extensive robustness checks account for a wide range of confounding factors and an alternative forecast horizon.

To guide empirical interpretation, a simple conceptual framework links fiscal policy

[1] Similarly, Laubach (2009) found that 1 percentage-point increase in the projected debt-to-GDP ratio raises 5-year and 10-year forward rates by about 3-4 basis points in the U.S.

[2] Fang *et al.* (2025) find that demand from institutional and nonresident investors is the most yield-sensitive. Asonuma *et al.* (2015); and Acharya and Steffen (2015) show that high bank holdings (home bias) can raise borrowing costs under high debt level and market stress. Arslanalp and Poghosyan (2016) and Ebeke and Lu (2015) document that higher share of sovereign debt owned by foreign investors can lower yields but raise yield volatility.

[3] See Adrian *et al.* (2025), Dell'Ariccia *et al.* (2018), Brunnermeier *et al.* (2016), and Farhi and Tirole (2018)). Coimbra (2020) provides a theoretical framework linking bank leverage to sovereign bond yields.

expectations to domestic borrowing costs through two channels: an Fiscal Theory of the Price Level (FTPL)-type inflation expectation channel and a term-premium channel, with the sovereign–bank nexus acting as an amplification mechanism.[4] The framework is not meant to distinguish the relative importance of these mechanisms, but to highlight potential channels underlying high sensitivity of domestic bond yields to fiscal shocks and to derive testable predictions.

The main results indicate that fiscal expectation significantly raises domestic borrowing costs, with effects amplified by bank exposures to sovereign debt. A 1 percentage point (p.p.) increase in 4-year ahead primary deficits is associated with a persistent rise in 5-year bond yields by about 31 basis points (bps) and 10-year bond yields by 26 bps over two years, peaking at 36 bps after 2.5 years in a sample excluding China and India. This pattern is consistent with a *fiscal dominance* interpretation, where fiscal policy rather than monetary policy anchors inflation expectations (Sargent and Wallace (1981)). In contrast to domestic bonds, external bond spreads are more sensitive to global risk factors. As expected, financial repression dampens this response. The findings are robust when controlling for other omitted factors, such as the country's sovereign credit risk, commodity terms-of-trade, global financial stress and domestic credit conditions, external bond spreads, and institutional quality. Moreover, the yield impact is materially larger in countries with a pronounced sovereign–bank nexus, where the cumulative effect can reach 50 basis points over two years.

Overall, the evidence suggests that local debt markets can discern default risk and hence fiscal credibility is critical for anchoring market confidence and local borrowing costs. Concentrated bank holdings heighten amplification, underscoring systemic risks from the sovereign–bank nexus and strengthening the case for credible fiscal anchors, robust prudential oversight, and effective resolution frameworks to mitigate feedback loops. Policies that deepen and diversify the investor base can enhance absorption capacity and reduce volatility due to abrupt shifts in risk appetite in local debt markets.

The remainder of the paper is structured as follows. Section 2 describes data and presents stylized facts on domestic debt structure. Section 3 outlines the conceptual framework. Section 4 estimates the baseline LP model and performs robustness checks. Section 5 estimates the heterogeneity by the creditor composition. Section 6 concludes.

[4] In the FTPL model (Sargent and Wallace (1981); Leeper (1991)), higher expected fiscal deficits raise inflation expectations and hence nominal interest rates. In preferred habitat models (Vayanos and Vila (2021)), larger duration-adjusted supply of sovereign debt issuance increases term premia.

# 2 Data and Background

## 2.1 Data

The bond yield data are sourced from the Bloomberg L.P. and cover sovereign bonds issued under domestic law in 75 EMDEs.[5] Domestic bonds are classified into two categories: (a) 5-year bonds (with maturities of three to seven years at issuance, representing medium-term bonds) and (b) 10-year bonds (with maturities of eight to thirteen years at issuance, representing long-term bonds). Bond-level data are aggregated at semi-annual frequencies and merged with the IMF's bi-annual World Economic Outlook (WEO) forecasts released in April and October. For each country and semi-annual period, the average yield of sovereign bonds is computed using the volume of sovereign bonds issued as weights.[6] Inflation-indexed sovereign bonds are excluded. The dataset also contains one-year up to four-year ahead WEO forecast for real GDP growth, annual inflation, primary fiscal deficits (in percent of GDP), and exchange rate depreciation rate, which are updated semi-annually or quarterly by the IMF country desks. The coverage of long-term bond yields is limited for many EMDEs given that there are no new issuances in some periods. After collapsing the data at semi-annual frequency, the panel dataset is reasonably balanced covering periods from 2010H1 to 2023H2.

Table 1 reports descriptive statistics for the main variables used in the regression analysis. As some variables contain missing observations, the analysis sample for 10-year bond yields (5-year bond yields) only covers 59 (71) countries (Annex A provides the full list of countries included in the analysis of 10-year yields). Domestic bond rates and macro-fiscal variables are winsorized at the top and bottom one percentile to trim outliers.

Panel A of Table 1 reveals wide cross-country dispersion in yields, with the 5-year and 10-year bond rates averaging 8.1 percent and 8.4 percent, respectively. External bond spreads are taken from IMF's Sovereign Spread Monitor (SSM) which offers broader EMDE coverage compared to standard data sources, such as JP Morgan Emerging Market Bond Index (EMBI) and the Global Financial Data. The SSM includes external sovereign bonds issued under foreign governing law (typically under UK or New York law), de-

[5]The sample includes a few countries that belong to the regional currency union. Because the bonds issued under each member's domestic law are included in the data, bonds issued in the regional market are treated as domestic debt, given that the legal framework and jurisdiction governing their debt obligation remain within each member state.

[6]Each bond's yield at issuance is weighted by volume at a given maturity – 5 years and 10 years. The maturity structure of new bonds issuances is therefore considered in aggregating bond-level to country-level yield data.

nominated in US dollar or euros (with outstanding amount above 250 million US dollar/Euro), and not covered by external guarantees. A country's external bond spreads are computed over U.S. Treasury yields (for USD-denominated bonds) or over German government yields (for euro-denominated bonds). The sample mean of external bond spreads is 4.4 percent (440 basis points), with the 95th percentile reaching about 11.6 percent (1160 basis points).

In Panel B, 4-year ahead primary deficits average modestly at 0.1 percent of GDP, while average public debt-to-GDP ratio stands at 56.4 percent of GDP. The average Central Bank monetary policy rate is 6.7 percent, which is significantly correlated with both domestic and external bond yields in the sample. Sovereign credit rating histories for each country were compiled from the three major rating agencies (Moody's, S&P, Fitch). A dummy variable indicates periods during which any of the three agencies' credit ratings fell into the non-investment grade rating (below Baa3/BBB-). Table 1 indicates that sovereign credit ratings were below Baa3/BBB- in 64 percent of the observations.

## 2.2 Evolving Landscape of Sovereign Debt Holder Composition

This subsection describes the evolution of the sovereign debt creditor base using an internationally comparable dataset on investor holdings compiled by Arslanalp and Tsuda (2014).[7] This dataset decomposes general government gross debt into six investor classes: domestic banks, domestic nonbanks, central bank, foreign banks, foreign nonbanks, and foreign official creditors.

Figure 1 shows that the level of sovereign debt held by domestic banks and institutional investors has risen substantially in recent years among emerging markets and developing economies. On average, domestic banks' holdings increased from 9 percent of GDP in 2010 to about 14 percent of GDP in 2020. The figure also shows an even sharper increase in sovereign debt holding by Non-Banking Financial Institutions (NBFIs), with its level reaching nearly 20 percent of GDP by 2020. The growing diversification of sovereign financing in many developing countries reflects (a) strengthened policy efforts to broaden the investor base, and (b) implementation of the the medium-term debt management strategy (MTDS). The MTDS lays foundations for domestic sovereign bond market development through risk management improvements and the introduction of primary deal-

[7]The dataset has been updated regularly every April and October by IMF's Money and Capital Market Department. It uses a definition of general government gross debt including securities and loans.

ers systems, which encourages domestic and foreign investors' participation (Clevy *et al.* (2021); IMF and World Bank, 2021, 2020). It may also reflect government's proactive measures by establishing hard and soft market infrastructure, strengthening market liquidity, deepening domestic financial sector with enhanced regulatory framework, and implementing structural reforms to attract diverse domestic and foreign investors toward developing countries.

Simultaneously, many EMDEs have continued to rely on foreign private investors via Eurobond issuance or foreign participation in local-currency (LC) bond markets. Large EMs earlier succeeded in attracting nonresident investors to their LC denominated bonds (Figure 2). Despite such progress, returns on the emerging market LC bond have been persistently weak over the past decade, primarily undermined by poor currency returns amid a strong dollar cycle (IMF (2025b)). The nonresident share of LC debt has declined after the COVID-19 pandemic, reflecting a significant increase in net issuance alongside subdued foreign inflows (Figure 2, left). At the country level, the reduction in LC sovereign bond holdings by foreign investors is particularly evident in large EMs such as Indonesia, Mexico, and South Africa (Figure 2, right).

Turning to domestic creditors, domestic banks have remained principal holders of government debt over the past decades in EMDEs. Figure 3 shows the distribution of sovereign debt among domestic creditors (residency-based definition). In both EMs and LICs, domestic banks and nonbanks (NBFIs) provide dominant source of financing for government. Notably for LICs, the share of domestic bank holdings rose from 30 percent to 50 percent of domestic debt.

Since the Global Financial Crisis, commercial banks' exposure to their sovereign debt has steadily increased, with an acceleration following the COVID-19 pandemic, thereby reinforcing the sovereign-bank nexus (Figure 4). The sovereign–bank nexus is defined as the share of each financial sector's assets invested in government securities or loans to the public sector, based on the IMF's Monetary and Financial Statistics (MFS) database, which measures the strength of the sovereign-financial linkages.[8]

As shown in Figure 4, COVID-related fiscal expansions pushed sovereign bond portfolios of domestic banks toward nearly one-fifth of total banking sector assets in major EMs and LICs by 2021 (IMF (2022)). Although the level differs across countries, most EMDEs

[8]The IMF's MFS database provides monthly aggregate surveys for about 160 countries, with which the exposure of commercial banks, central banks, and other financial corporations (OFC) to the public sector (defined as general government and SOEs) can be assessed.

experienced a sharp increase in the sovereign-bank nexus between 2020 and 2022 (Annex B). With public debt now at historically high levels, a deeper nexus heightens the risk of "doom loops", whereby sovereign distress and banking sector vulnerabilities mutually reinforce each other, amplifying credit risk across both sectors.

# 3 Conceptual Framework

This section develops a conceptual framework linking fiscal policy expectations to domestic sovereign borrowing costs. The analysis integrates three transmission channels:(a) inflation expectations (FTPL channel), (b) bond supply and term premia, and (c) the sovereign–bank nexus—into a unified framework. Full model derivations are provided in Annex C and Annex D, while this section focuses on the economic mechanisms and the key relationships that guide the subsequent empirical analysis.

## 3.1 FTPL Channel

Let $g_t$ denote the primary deficit-to-GDP ratio, positive when the government runs a deficit. Under fiscal dominance, expected inflation responds proportionally to expected future deficits, such that:

$$E_t[\pi_{t+k}] = \bar{\pi} + E_t[g_{t+k}] + \nu_{t+k}$$

where $\bar{\pi}$ is steady-state inflation and $\nu_{t+k}$ a shock term. The short-term nominal rate $i_{t+k}$ follows Fisher relation $i_{t+k} \approx r^*_{t+k} + E_t[\pi_{t+k}]$, where $r^*_{t+k}$ denotes the natural real rate. Averaging over maturities implies that expected short-term rates incorporate a baseline component $\bar{\imath}^{(n)}_t = r^* + \bar{\pi}$ and the expected path of future primary deficits. Intuitively, higher expected fiscal deficits raise expected inflation and, through the Fisher channel, increase nominal short-term rates. This constitutes the inflation expectation channel through which fiscal expectations are priced into yields.

## 3.2 Bond Supply and Term-Premium Channel

Fiscal deficits also influence yields through their effect on the net supply of sovereign bonds and associated term premia. Let $b_{t-1}$ denote the outstanding debt-to-GDP ratio and $\rho$ the fraction maturing each period, representing rollover needs. Over a finite forecast

horizon $K$ (e.g., $K = 4$ years), define the discounted sum of expected primary deficits as:

$$G_t^{(K)} = \sum_{k=0}^{K} \beta^k E_t[g_{t+k}]$$

with discount factor $\beta \in (0,1)$. When rollover needs or new issuances rise, investors demand higher returns to absorb additional bond supply. The sensitivity of investors' demand to fiscal shocks for a given maturity depends on the slope parameter $\alpha > 0$, which captures the price elasticity of investors' demand, and $\lambda_t$, the share of sovereign supply that must be absorbed domestically. When local financial markets are shallow (large $\lambda_t$), the price effect of additional issuance is magnified, leading to higher term premia.

### 3.3 Sovereign-Bank Nexus Channel

In many EMDEs, domestic banks hold a large portion of government debt, creating feedback between sovereign risk and financial stability. Let $s_{b,t}(n)$ denote the share of maturity-$n$ bonds held by banks. When yields rise, valuation losses weaken bank balance sheets, which in turn increase sovereign risk. This feedback can be represented by an amplification factor $(1 - \kappa s_{b,t}(n))^{-1}$, where $\kappa \in (0,1)$ measures the strength of the sovereign–bank nexus. A higher bank share ($s_{b,t}(n)$) or a stronger feedback intensity ($\kappa$) increases the overall sensitivity of yields to fiscal shocks, consistent with the "doom loop" mechanism.

### 3.4 Domestic Yield Equation

Combining the above channels yields an expression for the $n$-period domestic bond yield (see Annex C):

$$y_t^D(n) = \frac{\bar{\imath}_t^{(n)} + \frac{1}{n}\sum_{k=0}^{n-1} E_t[g_{t+k}] + \alpha\lambda_t \left(G_t^{(K)} + \frac{\rho}{1-\beta} b_{t-1}\right) + \gamma Z_t}{1 - \kappa s_{b,t}(n)} \tag{1}$$

where $Z_t$ represents global risk factors (e.g., U.S. Treasury interest rates, VIX), and $\gamma$ denotes their loading. Eq. (1) highlights that domestic yields depend on (a) a baseline interest rate component, (b) expected fiscal deficits and debt rollover pressures, (c) the depth of domestic financial markets, and (d) global risk conditions. The overall response is magnified by the degree of bank exposure to sovereign debt.

### 3.5 Comparative statics

Differentiating eq. (1) with respect to $G_t^{(K)}$ gives:

$$\frac{\partial y_t^D(n)}{\partial G_t^{(K)}} = \frac{\alpha\lambda_t + (1-\beta)/n}{1 - \kappa s_{b,t}(n)} > 0 \tag{2}$$

From these comparative statics, three testable hypotheses are derived. First, expected primary deficits increase domestic yields through both the inflation-expectation and bond-supply channels, with stronger effects when bank exposures are high (H1). Second, shorter-maturity yields respond more strongly to fiscal expectations than longer-maturity yields through the $1/n$ term (H2). Third, fiscal sensitivity is amplified when domestic banks dominate the investor base, reflecting sovereign-bank feedback effects (H3).

Following the IMF (2025b) framework, sovereign-debt resilience depends jointly on domestic savings and the composition of debt holders. Countries with greater domestic absorption capacity (lower $\lambda_t$) and more diversified resident investor bases (lower $\kappa$) should exhibit lower sensitivity of yields to fiscal expectations. The sensitivity of yield also increases when investors' demand is more elastic to fiscal shocks ($\alpha > 0$).

### 3.6 Dynamic Implications of Fiscal Expansions

In a forward-looking setting, anticipated fiscal expansions affect bond yields dynamically. Markets at time $t$ revise expectations about future primary deficits according to eq. (19) in Annex D. The resulting yield path (as expressed in eq. (20)) depends not only on the size of expected fiscal expansion but also on their timing (relative to bond maturities) and the persistence of fiscal shocks.

Two dynamic channels coexist and shape the trajectory of yield responses as expressed in eq. (21). First, through the FTPL inflation expectation channel, expected primary deficits that fall within the maturity horizon gradually feed into higher expected short-term rates, raising near- to medium-term bond yields. Second, through the term-premium channel, expectations of larger future bond supply increase the compensation investors demand for holding longer maturities, with effects intensifying as rollover dates approach. Over time, these effects are amplified by the sovereign–bank nexus, as banks' exposure reinforces the pass-through of fiscal risk into funding costs.

The dynamic analysis delivers three empirical patterns: yield responses are (a) hump-

shaped peaking as $t \to K$ and moderating thereafter; (b) maturity dependent ( shorter maturities react strongly when expected fiscal expansion falls within their short-term horizon, while longer maturities reflect term-premium effects when fiscal shock is distant); and (c) strong (costly) in financial systems where sovereign debt is concentrated with domestic banks.

This dynamic framework extends the static model by tracing the full adjustment path of yields to fiscal expectations, providing a theoretical foundation for the empirical analysis presented in the next section.

# 4 Econometric Analysis

## 4.1 Panel Local Projection (LP) Estimation

Drawing on domestic yield equation (eq. 1), the following reduced-form model estimates the sensitivity of domestic bond yields to an increase in expected primary deficits over time using the LP method.

$$y_{i,t+h}(n) - y_{i,t-1}(n) = \beta^h E_t(g_{i,t+4}) + \theta_1^h E_t(m_{i,t+4}) + \theta_2^h X_{i,t} + \sigma_i + \tau_t + \Delta\epsilon_{i,t+h} \quad (3)$$

where the left-hand side of the equation represents the cumulative change in the $n$-maturity domestic bond yields (in percentage) for country $i$ over eight semesters ($h = 0, ...8$) relative to the pre-shock period $t-1$.[9] $E_t(g_{i,t+4})$ is the IMF desk economists' 4-year ahead forecast of the expected level of primary fiscal deficits (in percent of GDP). $\sigma_i$ and $\tau_t$ are country and year-semester fixed effects.

Because fiscal conditions are not the sole determinant of long-term interest rates, the regression model includes an extensive set of control variables $X_{i,t}$. These controls account for baseline short-term interest rates, global risk conditions, and structural factors that influence the term premium. Forecasts are used as independent variables to the utmost extent, since long-horizon forecasts are presumably little affected by the contemporaneous state of the business cycle.

[9]Similar to Jaramillo and Weber (2013), long-horizon forward rates of domestic bond yields at semi-annual frequency are not available for many EMDEs. As noted in Laubach (2009), the absence of long-horizon forward bond yields may introduce a downward bias in the estimated effect of expected primary deficits, reflecting endogeneity arising from cyclical responses of fiscal variables and interest rates. Therefore, the reported estimates can be interpreted as conservative.

**Macro cyclical conditions:** Bond yields typically increase as expectations of future growth and inflation rise, as investors demand higher returns to compensate for anticipated price pressures. In EMDEs that depend more heavily on foreign investment, expectations of currency depreciation can also raise bond yields. Domestic bond yields may further be influenced by unanticipated macroeconomic shocks (Jaramillo and Weber (2013)). To account for these effects, 4-year ahead forecasts of real GDP growth, CPI inflation, and exchange rate (FX) depreciation ($E_t(m_{i,t+4})$) are included as control variables.

**Short-term interest rate:** Changes in the monetary policy rate are added to isolate the effects of monetary policy and to control for long-term trend in interest rates.

**Global financial spillovers:** Potential financial spillovers from global markets to EMDEs are addressed following Miranda-Agrippino and Rey (2020). The specification includes the U.S. 10-year Treasury forward rates and the Chicago Board Options Exchange's Volatility Index (VIX) as proxies for global financial conditions.

**Sovereign risk:** The level of sovereign risk at the time of fiscal loosening is controlled for by including a dummy variable indicating whether the sovereign credit rating is investment grade or non-investment grade.

**Demography, Inequality, Income level:** Demographic change and inequality can both influence equilibrium interest rates and the term premium. Population ageing tends to place downward pressure on interest rates by increasing aggregate savings and reducing investment demand, although it may exert upward pressure through expectations of fiscal deterioration driven by lower tax revenues and higher social security spending (Ichiue and Shimizu (2015)). Similarly, high inequality may depress the natural rate of interest as savings concentrate among high-income households with lower marginal propensities to consume, while in developing economies it can increase yields through expectations of greater fiscal burdens related to social spending. The combined effects of demographic trends and inequality therefore depend on investor demand for long- versus short-term assets, such as pension funds versus risk-averse households, as well as fiscal policy stance. To control for these structural factors, long-term population growth projection from the United Nations and the income share of the bottom 50th percentile from the World Inequality Database are included. In addition, GDP per capita (at purchasing power parity

(PPP), in international US$) is added to capture correlations between bond yields and income levels.

Previous studies have adopted varying horizons for fiscal expectations, ranging from same-year to one-year-ahead projections (Cimadomo *et al.* (2016)). However, using long-horizon expectations of fiscal variables serves two purposes. First, it helps mitigate potential reverse causality, whereby bond yields may affect primary fiscal balances, which could otherwise bias coefficient estimates downward. This is driven by the fact that both fiscal balances and bond yields may be influenced by common cyclical factors: fiscal policy tends to be more expansionary during recessions (resulting in larger deficits), while economic downturns are often associated with lower interest rates due to monetary policy easing. Employing long-horizon expectations of fiscal variables allows the effects of fiscal policy to be distinguished from cyclical fluctuations, consistent with standard approaches in the reduced-form empirical literature. Second, four-year ahead expectations of fiscal deficits capture the anticipated long-term fiscal stance, reflecting market perceptions and the forward-looking behavior of investors.

## 4.2 Panel LP Results

The impulse responses from the LP regression show high and increasing sensitivity of domestic bond yields to expected fiscal loosening with the effects peaked in 2-3 years (Figure 5; Annex E). In response to a 1 p.p. of GDP increase in 4-year ahead primary deficits, the contemporaneous yield response at time $t$ is about 7-12 basis points (bps) for 5-year bonds (column 1 in Table A2) and 6-10 bps for 10-year bonds (column 2).[10] The information on fiscal policy that investors receive remains relevant over time, exhibiting high persistence. After one year (two semesters), the point estimates nearly double in magnitude, suggesting that markets gradually price in the risks associated with expected fiscal loosening with some lag. After two years (four semesters), 1 p.p. of GDP increase in primary deficits leads to a sustained rise in 5-year and 10-year bond yields by about 31 bps and 26 bps respectively in a full sample. The short-term yield response is relatively stronger for 5-year bonds than 10-year bonds, in consistent with the model prediction. When China and India are excluded, or when the sample is restricted to major (frequent) bond issuers in EMDEs, the estimated effects become even larger.

[10]The point estimates in Figure 5 and Annex E show the impact in percentage. The impact in basis point is derived by multiplying estimates by 100.

The peak impact on 10-year bond yields reaches around 36 bps after 2.5 years in EMDEs excluding China and India. Beyond three years, the effect begins to diminish, showing a hump-shaped response as predicted by the model. The estimated magnitudes are economically significant and broadly consistent with Jaramillo and Weber (2013), who find that a 1 p.p. increase in the overall fiscal deficit-to-GDP ratio raises yields by 30 bps in emerging economies. The estimates also lie within the midrange of results found for advanced economies in the existing literature.

Additional evidence suggests that the sensitivity of bond yields to expected fiscal loosening has somewhat increased since the COVID-19 pandemic. Eq. (3) is estimated for both the full sample (blue line) and the pre-COVID period (red line) (Figure 6). The results consistently indicate that the average responsiveness of 10-year bond yields to a 1 p.p. increase in 4-year-ahead primary deficits has risen in the post-COVID period. Two years after the fiscal shock, the estimated impact on bond yields is about 10 bps higher for the full sample compared with the pre-COVID subsample among all EMDEs excluding China and India (left chart), and about 9 bps higher among major issuers in EMDEs.

## 4.3 Robustness Checks

### 4.3.1 Financial repression

The impulse response of 10-year bond yields to expected primary deficits becomes stronger, with a more pronounced short-term effect, when periods of financial repression are excluded from the sample (Table 2). Following the sharp increase in public debt after the Global Financial Crisis, several jurisdictions imposed administrative ceilings on interest rates. Using the database of Jafarov *et al.* (2019) and Calice *et al.* (2020), periods of financial repression are identified for each country based on the presence of legal restrictions on interest rates, credit allocation, capital movements, and other financial operations.[11] While noting that interest rate caps serve as an incomplete proxy for financial repression, the robustness of the baseline result reported in Figure 5 is assessed by re-estimating eq. (3) on a subsample excluding all periods with interest rate restrictions. In both the full sample (excluding China and India) and the subset of major EMDEs, the short-term responses of 10-year bond yields to 1 p.p increase in 4-year ahead primary deficits is found to be

[11] Interest rate caps capture one dimension of financial repression but miss other non-market operations in government security issuances, such as private placements. World Bank's domestic debt securities heat map provides complementary information on such nonmarket-based practices, although its country-year coverage is limited for my analysis.

significantly stronger - rising by 28 bps and 31 bps, respectively - with the effect peaked in one year (columns 2 and 4).

#### 4.3.2 Controls for other channel

To assess the robustness of the baseline results to potential omitted variable bias, additional control variables are introduced to capture alternative channels related to (a) sovereign credit risk, (b) commodity price cycles, (c) financial stress and credit conditions, (d) external bond spreads, and (e) institutional quality. These extensions are implemented in an alternative specification that includes only country fixed effects (Table 3).

**Expected public debt (columns 2 and 9):** Fiscal vulnerabilities also depend on market expectations regarding future government debt levels which influence the impact on long-term interest rates (Reinhart *et al.* (2001)). When 4-year ahead public debt-to-GDP ratio is added to eq. (1), the point estimate on expected primary deficits slightly declines in magnitude but remains significantly positive, suggesting that anticipated fiscal deterioration continues to exert upward pressure on domestic bond yields.

**Commodity prices (columns 3 and 10):** For commodity exporting EMDEs, exogenous shifts in global commodity prices constitute a key driver of business cycles and government revenues (both tax and non-tax revenues), commonly referred to as the "commodity roller coaster" (Fernández *et al.* (2018)). Improvements in the terms-of-trade (TOT) can enhance growth prospects and fiscal balances, potentially reducing bond yields. In columns 3 and 10, the commodity net export price index from Gruss and Kebhaj (2019) is included. The coefficient on commodity TOT on 10-year bond yields is statistically insignificant on average, although it inclusion slightly increases the estimated impact of expected primary deficits.

**Financial stress and credit conditions (columns 4, 5, 11, and 12):** Global financial tightening - through changes in interest rates, liquidity, or investor risk perceptions- can raise sovereign bond spreads (Gilchrist *et al.* (2022)). Periods of financial stress are often associated with weaker fiscal discipline and higher borrowing costs. To account for this channel, columns 4 and 11 include the Financial Stress Index (FSI) (Ahir *et al.* (2023)), a country-specific composite indicator capturing financial stress related to stock market volatility, credit spreads and liquidity conditions. With FSI included, the coefficient on

expected primary deficits remains strong and significant. Alternatively, columns 5 and 12 control for domestic credit cycles, measured by credit gaps defined as deviations of private credit-to-GDP ratios from their long-term trends (Hodrick-Prescott (HP) filtered), as a potential driver of sovereign spreads using quarterly data from the International Financial Statistics. A positive credit gap - indicating credit growth above each country's long-term trend- tends to be associated with higher bond yields, particularly in semi-elasticity specifications, yet the effect of expected primary deficits remains robust.

**External bond spread (columns 6 and 13):** External financing conditions also affect domestic borrowing costs. A widening of sovereign external bond spreads reflects higher perceived default risk, which can raise domestic yields as governments face higher external borrowing costs or lose market access, thus substitute toward domestic financing. The analysis employs data from the IMF's Sovereign Spread Monitor, which provides broader coverage of EMDEs than alternative sources such as J.P. Morgan Emerging Market Bond Index. Results in columns 6 and 13 confirm a strong correlation between domestic yields and external bond spreads, consistent with shared exposure to sovereign credit risk. Even after controlling for this effect, 1 p.p. increase in the expected 4-year ahead primary deficits continues to raise 10-year bond yields with larger magnitudes.

**Institutional quality (columns 7 and 14):** Institutional quality—political, economic, and financial—has long been identified as a key determinant of sovereign borrowing costs in emerging markets (Sonenshine and Kumari (2022); Huang *et al.* (2015)). To capture this dimension, the International Country Risk Guide (ICRG) composite risk rating is included as a proxy for overall institutional strength. Higher ICRG scores, reflecting stronger institutional frameworks, are associated with lower domestic bond yields. Results in columns 7 and 14 show that the effect of expected primary deficits remains statistically significant and slightly larger in magnitude compared to the baseline estimates, underscoring the robustness of the fiscal channel.

#### 4.3.3 Alternative forecast horizon

To examine whether the results are sensitive to the choice of forecast horizon in the expected primary deficit variable, an alternative specification using 2-year ahead forecasts is estimated. While longer forecast horizon (such as 4-year ahead expectation) is preferable

for capturing a country's medium-term fiscal stance and mitigating endogeneity bias, Table 4 reports the results comparable to Table A2 based on 2-year ahead primary deficit forecasts. The magnitude of the estimated coefficients declines modestly—by approximately 7 basis points for ten-year bond yields—relative to the baseline estimates, yet the results remain robust. The expected fiscal expansion continues to exert a statistically and economically significant upward effect on sovereign bond yields, confirming the consistency of the main findings across different expectation horizons.

## 4.4 Comparison with External Bond Spread Sensitivity

To contrast the response of domestic and external sovereign borrowing costs to fiscal expectations, the same LP specification is used to estimate the cumulative impulse response of external bond spreads to 4-year ahead expected primary deficits. In addition to the explanatory variables in eq. (3), the baseline specification additionally includes 4-year ahead forecasts of current account balance and total external debt (both in percent of GDP). The dependent variable is the external bond spread obtained from the IMF's SSM database.

As shown in Figure 7, the estimated sensitivity of external bond spread to 4-year ahead expected primary deficits is statistically insignificant over the three-year horizons.[12] In contrast to domestic bond yields, external bond spreads respond more strongly to global financial variables—such as the U.S. Treasury interest rate and the VIX—as well as to external sector indicators including the current account balance and total external debt. The influence of local fiscal expectations is comparatively limited.

This pattern remains consistent when controlling for additional confounding factors, such as the ratio of foreign reserves to GDP, suggesting that global risk sentiment and external balance conditions play a dominant role in shaping external bond spreads in EMDEs. These findings align with existing evidence, including the IMF's Fiscal Monitor (October 2024) and Du and Schreger (2016)), which similarly emphasize the greater sensitivity of external yields to global financial conditions relative to domestic bonds.[13]

[12]The point estimates in Figure 7 report the impact in percentage. The equivalent impact in basis point is the estimates multiplied by 100.

[13]Figure 7 presents results from the baseline specification. Foreign reserves-to-GDP is one of the critical determinants of external bond yields, but its 4-year ahead forecast is available from the IMF's Balance of Payment and International Investment Position (BOP/IIP) statistics only after 2014. Including this variable reduces the sample size but does not materially affect the estimated impulse responses.

# 5 Heterogeneity by Debt Holder Composition

This section extends the LP model to account for nonlinear effects of fiscal policy on domestic bond yields arising from differences in investor composition and the sovereign-bank nexus. Given the evolving structure of public debt across EMDEs (as discussed in Section 2.2), the analysis explores how the sensitivity of yields to fiscal expectations varies across countries depending on shifts in debt composition.

To quantify this heterogeneity, the Kitagawa-Blinder-Oaxaca (KBO) decomposition is applied following Cloyne *et al.* (2023), allowing impulse responses to vary across countries and over time with differences in debt structure:

$$\begin{aligned} y_{i,t+h} - y_{i,t-1} &= \beta^h E_t(g_{i,t+4}) + \gamma^h (s_{i,t-1} - \bar{s}) \cdot E_t(g_{i,t+4}) + \eta_i^h (s_{i,t-1} - \bar{s}) \\ &+ \theta_1^h E_t(m_{i,t+4}) + \theta_2^h X_{i,t} + \sigma_i + \tau_t + \Delta\epsilon_{i,t+h} \end{aligned} \tag{4}$$

In this specification, $s_{i,t-1}$ is structural variables, including (a) the sovereign-bank nexus ratio and (b) the investor composition of sovereign debt - that is, the shares held by foreign non-banks, domestic banks, and domestic non-banks. Each variable is lagged by one year, and demeaned relative to the pre-COVID global average $(s_{i,t-1} - \bar{s})$. The term $\eta_i^h$ captures country-specific effects associated with debt composition.

Country- and year-specific marginal effects of the 4-year ahead primary deficits on bond yields are then estimated using this flexible linear-interaction specification, which allows for continuous variation rather than the state-dependent LP model with binary state (high vs. low regimes). The interaction term $\gamma^h(s_{i,t-1} - \bar{s})$ measures the contribution of debt composition – proxied by the sovereign-bank nexus or investor base – to the responsiveness of yields, in addition to the direct fiscal effect. The marginal effect is defined as follows:

$$\frac{\partial(y_{i,t+h} - y_{i,t-1})}{\partial E_t(g_{i,t+4})} = \beta^h + \gamma^h(s_{i,t-1} - \bar{s}) \tag{5}$$

$\beta^h$ is the direct effect of expected primary deficits when the sovereign-bank nexus or the level of investors' holding is at its pre-COVID global average ($s_{i,t-1} = \bar{s}$). The KBO decomposition framework enables this effect to vary across countries and over time, depending on the estimated value of $\hat{\gamma^h}(s_{i,t-1} - \bar{s})$, while controlling for differences in debt structure (Cloyne *et al.* (2023)). This approach captures key developments in domestic debt composition over the past decade, including the increasing share of domestic

bank and nonbank holdings of government securities (Figure 1), the decline in nonresident holdings of local-currency denominated bonds in major EMDEs (Figure 2), and the strengthening of the sovereign-bank nexus (Figure 3).

## 5.1 Results

### 5.1.1 Sovereign-Bank Nexus

Results show that domestic bond yields are more sensitive to expected fiscal loosening in countries with stronger sovereign-bank nexus. The cumulative impact over a two-year horizon ($h = 4$) is estimated, and the estimated parameters from eq. (4) are reported in Annex F. The coefficient $\gamma$ for the sovereign-bank nexus is positively signed on average (column 1), suggesting that higher bank exposures to government securities amplify the effect of fiscal expansion on domestic borrowing costs. Figure 8 plots the marginal effect of expected primary deficits on 10-year bond yields as a y-axis, and how it varies across the distribution of the centered sovereign-bank nexus ratio as x-axis. The figure reveals a clear positive relationship and substantial cross-country heterogeneity: the greater the sovereign-bank nexus, the higher the sensitivity of domestic bond yields to fiscal policy. This pattern reflects investors' concerns about financial stability risk associated with high sovereign exposures in the banking system. A shift from the 25th to the 75th percentile of the sovereign-bank nexus implies an average increase in yields of about 13 bps for all EMDEs excluding China and India, and about 17 bps for major EMDEs. At the upper end of the nexus distribution – where banks' exposure to government securities approaches 40-50 percent of total banking sector assets – the estimated effect of fiscal loosening on 10-year bond yields can reach 50 bps, underscoring the amplifying role of the sovereign–bank nexus.

### 5.1.2 Concentration of Sovereign Debt's Holder Composition

The sensitivity of domestic bond yields to fiscal policy is strengthened when sovereign debt holdings become more concentrated among specific types of creditors. Annex F reports the estimated $\gamma$ for foreign NBFIs holdings (column 2), domestic bank holdings (column 3) and domestic NBFIs holdings (column 4). The coefficients are positive and statistically significant – except for domestic nonbank holding – indicating that fiscal loosening is associated with higher borrowing costs when the exposure to sovereign debt is

concentrated in certain investor groups.

**Foreign investor base** (Figure 9, left): In large EMs, the result suggests that greater participation of nonresident investors in local bond markets (Figure 2) tends to amplify the transmission of fiscal shocks to domestic bond yields. From a financial development perspective, foreign investor participation in local bond markets can help alleviate "original sin" constraints and mitigate credit risks associated with "home bias" (Saka (2020); Andreeva and Vlassopoulos (2019)). However, such participation can also become a "double-edged sword" for EMDEs, as dependence on foreign creditors heightens vulnerability to shifts in global risk sentiment and investor perceptions. While low-income countries continue to rely more on foreign investors, major EMDEs have experienced a decline in nonresident holdings since the COVID-19 pandemic. The combination of limited external market access and large sell-offs of local-currency bonds by foreign investors has reduced sovereign exposure to foreign creditors. Taking this trend into account, the contribution of foreign NBFI exposure to domestic bond yield dynamics appears to have weakened.

**Domestic investor base** (Figure 9, center and right): Following the pandemic, many large EMDEs have reallocated government financing from external to domestic sources, leading to increased concentration of sovereign debt holdings among domestic banks and NBFIs. As these institutions expanded their exposure to government securities, they began to demand higher yields on new issuances, thereby increasing the responsiveness of local bond yields to fiscal expansion. This relationship is particularly pronounced where government debt is heavily concentrated in domestic banks. The marginal effect curve in Figure 9 (center panel) shows a steep positive slope, indicating that a higher share of bank-held debt amplifies the yield response to fiscal loosening. A shift from the 25th to the 75th percentile of domestic bank holdings relative to GDP corresponds to an average yield increase of approximately 11 bps for all EMDEs excluding China and India. This pattern underscores the growing importance of domestic financial institutions as both stabilizers and amplifiers in sovereign debt markets.

## 5.2 Heterogeneous Effect of Fiscal Policies on External Bond Spreads

As a comparitive exercise, Annex G examines how the effect of fiscal policies on external bond spreads varies with the strength of sovereign-bank nexus and the composition

of sovereign debt holders. Compared with the result for domestic bond yields (Figures 8 and 9), the estimated interaction effects of fiscal policy with the sovereign–bank nexus or domestic bank holdings become statistically insignificant. By contrast, a significantly stronger effect emerges in countries with larger shares of sovereign debt held by foreign nonbank investors (Figure A3, left). An increase in the ratio of foreign nonbank holdings to GDP from the 25th to the 75th percentile is associated with an average rise in external bond spreads of about 25 basis points. The steep positive slope of the marginal effect line indicates a markedly higher fiscal sensitivity in economies with substantial foreign nonbank exposure to sovereign bonds. These findings underscore the contrasting transmission mechanisms between domestic and external borrowing costs: domestic bond yields are primarily influenced by domestic financial intermediaries, while external bond yields are more vulnerable to shifts in global investor sentiment and foreign portfolio behavior.

### 5.3 A Counterfactual Local Projection: Sensitivity-based Estimation

To further explore the interaction between fiscal policy and debt composition, a counterfactual local projection (LP) framework is developed that exploits cross-country variation in the responsiveness of domestic debt financing to fiscal policy. The reduced-form KBO specification in eq. (4) treats the debt composition variable $s_{i,t}$ as exogenous, even though both investors' portfolio decisions and governments' reliance on specific financing sources are likely to respond endogenously to future fiscal policy stance. To address this identification concern, the analysis adopts a sensitivity-instrument approach (Cloyne *et al.* (2023); Guren *et al.* (2021); Nakamura and Steinsson (2014)). The identification assumption is that there is cross-country differences in the average response of domestic debt financing – whether from domestic banks, domestic NBFIs, or foreign NBFIs – to fiscal shocks, but that this variation is not, on average, correlated with other omitted macroeconomic disturbances. The proposed method proceeds in two steps:

**Step 1:** The first step estimates the cross-country "sensitivity proxy" ($\varphi_i^h$) of domestic debt $s_{i,t}$ in response to expected fiscal expansion, allowing the coefficient to vary across countries. This specification captures how domestic debt holdings by different investor groups (domestic banks, domestic nonbanks, or foreign nonbanks) respond to changes in

expected fiscal loosening.

$$s_{i,t+h} = \varphi_i^h E_t(g_{i,t+4}) + \theta_1^h E_t(m_{i,t+4}) + \theta_2^h X_{i,t} + \sigma_i + \tau_t + \Delta\nu_{i,t+h} \tag{6}$$

**Step 2:** The second step estimates the heterogeneous response of domestic bond yields to fiscal policy under counterfactual scenarios where the estimated sensitivity proxy $\hat{\varphi}_i^h$ deviates from its mean value. These counterfactuals represent hypothetical increases in governments' reliance on deficit financing from specific investor groups (domestic banks, NBFIs, or foreign NBFIs).

$$y_{i,t+h} - y_{i,t-1} = \beta^h E_t(g_{i,t+4}) + \gamma^h \hat{\varphi}_i^h \cdot E_t(g_{i,t+4}) + \theta_1^h E_t(m_{i,t+4}) + \theta_2^h X_{i,t} + \sigma_i + \tau_t + \Delta\epsilon_{i,t+h} \tag{7}$$

where all covariates and $\hat{\varphi_i^h}$ are centered relative to their sample mean. The marginal effect of fiscal policy on domestic bond yields is given by $\frac{\partial y_{i,t+h} - y_{i,t-1}}{\partial E_t(g_{i,t+4})} = \beta^h + \gamma^h \hat{\varphi}_i^h$.

## 5.4 Results of the Counterfactual LP Regression

The impulse responses from **the first-stage estimation** indicate that sovereigns tend to increase their reliance on debt financing from domestic banks, domestic nonbanks, and foreign nonbanks in response to expected fiscal expansion (Figure 10). A 1 p.p. of GDP increase in 4-year ahead primary deficits is associated with a 0.2 p.p. rise in domestic banks' holdings of government debt (left panel) and a cumulative 0.3 p.p. increase in foreign nonbanks' holdings over two years (right panel), both statistically significant at the 95 percent significance level. The response of domestic nonbank financing appears statistically insignificant (center panel).

**The second-stage regression** result (Figure 11) shows that the sensitivity of 10-year bond yields to fiscal expansion is stronger in countries with greater reliance on domestic banks for deficit financing – that is, where the sovereign-bank nexus is more pronounced. Figure 11 plots the marginal effect of 1 p.p. fiscal expansion ($\beta^h + \gamma^h \hat{\varphi}_i^h$) over two years ($h = 4$) on the y-axis against different percentiles (10th – 90th) of the financing sensitivity proxy on the x-axis.

Result confirms that 10-year bond yields respond more sharply to expected fiscal loosening in EMDEs with stronger dependence on domestic bank financing (upper panels). A shift from the 25th to the 75th percentile of the sensitivity-proxy – measured by ei-

ther the sovereign-bank nexus or domestic banks holding-to-GDP ratio – corresponds to an average yield increase of about 20 bps in response to a 1 p.p. of GDP increase in expected primary deficits. While the first-stage results indicate a significant increase in sovereign financing through foreign nonbanks (Figure 10, right), the second-stage results show that the sensitivity of 10-year bond yields to fiscal expansion remains broadly unchanged across different percentile values of the foreign nonbank sensitivity-proxy. These findings remain robust when the sample is restricted to major EMDEs and when the same model is estimated for shorter-term (5-year) bond yields.

Overall, the counterfactual LP analysis corroborates the reduced-form KBO decomposition results presented in section 5.1. The evidence indicates that (a) the contribution of expansionary fiscal policy to domestic bond yields is amplified in countries with a stronger sovereign–bank nexus, and (b) in major emerging markets, domestic banks have become increasingly sensitive to fiscal imbalances, effectively imposing higher borrowing costs on sovereigns undertaking fiscal expansion.

# 6 Conclusions

This paper examines how fiscal policy expectations shape domestic sovereign borrowing costs in EMDEs, and how this relationship depends on the composition of debt holders. By combining a broad cross-country dataset covering 75 EMDEs with post-COVID evidence, the analysis provides robust evidence that fiscal discipline remains a key determinant of market confidence and financing conditions in local debt markets. The local projection estimation shows that domestic investors price fiscal expectations into yields: 1 p.p. increase in expected primary deficits raises 10-year bond yields persistently, peaking at around 36 basis points after 2.5 years in EMDEs. The sensitivity of yields to fiscal expansion has moderately increased in the post-COVID period, reflecting heightened concerns about fiscal sustainability under tighter global financial conditions. These findings remain robust to controls for sovereign credit risk, commodity terms-of-trade, global financial stress, domestic credit conditions, external bond spreads, and institutional quality. The findings underscore the pronounced role fiscal policy plays in determining the cost of domestic borrowing, in contrasts with external bond spreads that are more sensitive to external and global risk factors.

In terms of the creditor composition of domestic debt, the heterogeneity analysis re-

veals that the impact of fiscal expansion on borrowing costs is amplified in countries with a strong sovereign–bank nexus. In countries where domestic banks exhibit the highest sovereign exposure globally, the marginal effect of a 1 p.p. increase in 4-year ahead primary deficits can reach about 50 basis points over two years. By contrast, external bond spreads respond more strongly to fiscal policy in countries with greater participation of foreign non-bank investors. For economies with large domestic financing needs – for example, a country with annual gross financing requirements around 30 percent of GDP – an additional 30-basis-point increase in yields translates into roughly 1 percent of GDP in extra annual interest costs when issuing a 10-year bond at the new, higher interest rate.

Overall, the evidence underscores that fiscal policy credibility and investor composition jointly shape sovereign borrowing costs. The amplifying effect of banking sector exposure to sovereign debt elucidates the interconnectedness of fiscal and financial sectors. In countries characterized by a tighter sovereign-bank nexus, loose fiscal policies are associated with an elevated risk premium. This situation not only leads to higher borrowing costs for countries with significant banking sector exposure to the public sector but also renders these economies susceptible to "doom loops." In such environments, loose fiscal policies not only increase borrowing costs but can potentially exacerbate macro-financial vulnerabilities. These findings highlight the importance of maintaining credible fiscal anchors, strengthening prudential supervision of the financial sector, and developing effective bank-resolution mechanisms to mitigate sovereign-bank feedback risks. At the same time, broadening and diversifying the domestic investor base can enhance market depth and absorption capacity, reducing susceptibility to abrupt shifts in investor sentiment and improving resilience of local debt markets to fiscal and global shocks.

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TABLE 1: Descriptive Statistics: Analytical Sample

| | Source | N | Mean | Std dev | p25 | p50 | p75 |
|---|---|---|---|---|---|---|---|
| **Panel A. Bond yields and spreads** | | | | | | | |
| 5 year treasury bond rate (%) | Bloomberg | 1,584 | 8.077 | 6.126 | 4.270 | 6.714 | 9.972 |
| 10 year treasury bond rate (%) | Bloomberg | 1,281 | 8.399 | 6.086 | 4.707 | 7.135 | 10.464 |
| External bond spreads (%) | IMF SSM | 1,618 | 4.394 | 5.397 | 1.737 | 3.105 | 4.962 |
| **Panel B. Basic control variables** | | | | | | | |
| Primary deficit/GDP (%) (t+4) | WEO | 1,584 | 0.074 | 2.582 | -1.151 | 0.089 | 1.499 |
| Public debt-to-GDP (%) (t+4) | WEO | 1,562 | 56.389 | 25.592 | 40.049 | 53.509 | 70.077 |
| GDP growth (%) (t+4) | WEO | 1,584 | 4.450 | 1.746 | 3.191 | 4.292 | 5.734 |
| CPI inflation (%) (t+4) | WEO | 1,583 | 4.236 | 2.662 | 2.500 | 3.772 | 5.000 |
| FX depreciation (%) (t+4) | WEO | 1,584 | 1.720 | 3.024 | 0.000 | 1.000 | 2.971 |
| Monetary policy rate (%) | Haver | 1,431 | 6.768 | 6.196 | 3.000 | 5.250 | 8.250 |
| Log GDP Per Capita | WEO | 1,584 | 9.366 | 0.916 | 8.716 | 9.573 | 9.999 |
| US 10 Year treasury forward rate (%) | CF | 1,584 | 3.963 | 0.769 | 3.283 | 3.737 | 4.518 |
| Log VIX | Haver | 1,533 | 2.893 | 0.315 | 2.660 | 2.858 | 2.963 |
| Population growth (%) (t+20) | UN | 1,558 | 0.683 | 0.983 | -0.134 | 0.606 | 1.501 |
| Post-tax income share, bottom 50th percentile (%) | WID | 1,376 | 15.472 | 4.141 | 12.653 | 15.029 | 17.956 |
| Sovereign non-investment grade (0/1) | MSF | 1,457 | 0.641 | 0.480 | 0.000 | 1.000 | 1.000 |

SOURCE: WEO: World Economic Outlook, CF: Consensus Forecast, WID: World Inequality Database, MSF: Moodys, S&P, Fitch; SSM: Sovereign Spread Monitor.
NOTE: The summary statistics of bond yields and spreads are for the analysis sample with non-missing primary deficit data. The summary statistics of basic control variables for our econometric analysis is provided in Panel B for the analysis sample with non-missing 5-year bond yields.

TABLE 2: Robustness Check to Financial Repression

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | **10 Year Yield** | | | |
| | **ALL (excl CHN/IND)** | | **Major EMDE** | |
| | Total | No FR | Total | No FR |
| **Dependent variable**: $\Delta r_t$ | | | | |
| $E_t(g_{t+4})$ | 0.067 | 0.139 | 0.096** | 0.195** |
| | (0.043) | (0.085) | (0.048) | (0.089) |
| Observations | 804 | 365 | 664 | 323 |
| Adj. R2 | 0.119 | 0.125 | 0.162 | 0.143 |
| Number of countries | 54 | 32 | 36 | 27 |
| Country-Year-Semester FE | Yes | Yes | Yes | Yes |
| **Dependent variable**: $\Delta r_{t+2}$ | | | | |
| $E_t(g_{t+4})$ | 0.126* | 0.276** | 0.163* | 0.309** |
| | (0.073) | (0.121) | (0.085) | (0.130) |
| Observations | 796 | 363 | 665 | 323 |
| Adj. R2 | 0.363 | 0.441 | 0.388 | 0.454 |
| Number of countries | 52 | 32 | 35 | 27 |
| Country-Year-Semester FE | Yes | Yes | Yes | Yes |
| **Dependent variable**: $\Delta r_{t+4}$ | | | | |
| $E_t(g_{t+4})$ | 0.286*** | 0.291* | 0.297*** | 0.304 |
| | (0.076) | (0.173) | (0.090) | (0.189) |
| Observations | 722 | 342 | 611 | 309 |
| Adj. R2 | 0.453 | 0.485 | 0.471 | 0.494 |
| Number of countries | 51 | 32 | 36 | 28 |
| Country-Year-Semester FE | Yes | Yes | Yes | Yes |

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.010$

Source: Staff estimates.

Note: Heteroskedasticity-robust standard errors in parentheses. $\Delta r_t$ in the first row indicates the instantaneous impact at time $t$. $\Delta r_{t+2}$ in the second row and $\Delta r_{t+4}$ in the third row indicate the impact after one year and two years, respectively.

TABLE 3: Robustness Check to Extensive Control Variables

| | (1) Baseline | (2) Debt | (3) TOT | (4) FSI | (5) Credit gap | (6) Spread | (7) Inst. quality | (8) Baseline | (9) Debt | (10) TOT | (11) FSI | (12) Credit gap | (13) Spread | (14) Inst. quality |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Dependent variable**: $\Delta r_{t+4}$ | | | | | | | | | | | | | | |
| $E_t(g_{t+4})$ | 0.259*** | 0.251*** | 0.268*** | 0.291*** | 0.294*** | 0.371*** | 0.268*** | 0.297*** | 0.282*** | 0.311*** | 0.338*** | 0.301*** | 0.431*** | 0.305*** |
| | (0.074) | (0.081) | (0.069) | (0.090) | (0.074) | (0.084) | (0.071) | (0.090) | (0.104) | (0.088) | (0.103) | (0.090) | (0.098) | (0.090) |
| Public debt/GDP (t+4) | | 0.008 | | | | | | | 0.012 | | | | | |
| | | (0.012) | | | | | | | (0.015) | | | | | |
| Commodity Net Export Price Index | | | -0.019 | | | | | | | -0.008 | | | | |
| | | | (0.029) | | | | | | | (0.038) | | | | |
| Financial Stress Index (Ahir et al, 2023) | | | | 3.692* | | | | | | | 3.745* | | | |
| | | | | (2.179) | | | | | | | (2.229) | | | |
| Credit gap (HP filter) | | | | | 0.028 | | | | | | | -0.002 | | |
| | | | | | (0.024) | | | | | | | (0.034) | | |
| $\Delta ln(spread)_{t+4}$ | | | | | | 1.902*** | | | | | | | 2.266*** | |
| | | | | | | (0.311) | | | | | | | (0.379) | |
| ICRG Country Risk | | | | | | | 0.066 | | | | | | | 0.067 |
| | | | | | | | (0.046) | | | | | | | (0.052) |
| Observations | 770 | 761 | 770 | 639 | 686 | 506 | 730 | 611 | 607 | 611 | 539 | 586 | 432 | 589 |
| Adj. R2 | 0.440 | 0.428 | 0.423 | 0.402 | 0.427 | 0.524 | 0.423 | 0.471 | 0.447 | 0.445 | 0.414 | 0.431 | 0.572 | 0.445 |
| Number of countries | 53 | 53 | 53 | 39 | 48 | 41 | 49 | 36 | 36 | 36 | 29 | 34 | 31 | 34 |
| Country FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.010$

SOURCE: Author's estimates.

NOTE: Heteroskedasticity-robust standard errors in parentheses

TABLE 4: Robustness Check Using 2-Year Ahead Primary Deficits Change in Sovereign Bond Yields (in percentage)

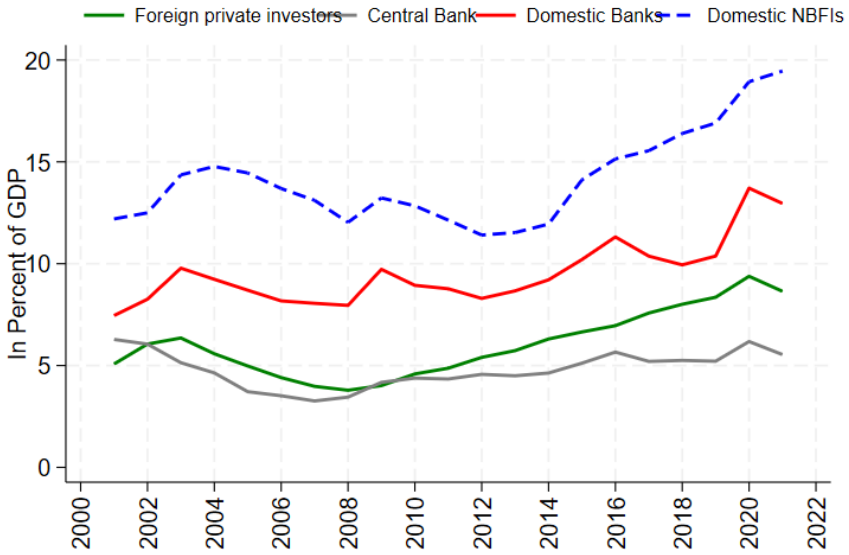
| | (1) 5 Year Yield | | | (2) 10 Year Yield | | |
|---|---|---|---|---|---|---|
| | ALL | Excl CHN/IND | Major issuers | ALL | Excl CHN/IND | Major issuers |
| **Dependent variable**: $\Delta r_t$ | | | | | | |
| $E_t(g_{t+2})$ | 0.044 | 0.049 | 0.100** | 0.033 | 0.035 | 0.058 |
| | (0.034) | (0.035) | (0.040) | (0.033) | (0.035) | (0.038) |
| Observations | 1046 | 994 | 765 | 856 | 804 | 664 |
| Adj. R2 | 0.164 | 0.164 | 0.158 | 0.112 | 0.116 | 0.157 |
| Number of countries | 65 | 63 | 37 | 56 | 54 | 36 |
| Country-Year-Semester FE | Yes | Yes | Yes | Yes | Yes | Yes |
| **Dependent variable**: $\Delta r_{t+2}$ | | | | | | |
| $E_t(g_{t+2})$ | 0.119** | 0.132** | 0.169*** | 0.095 | 0.095 | 0.122* |
| | (0.053) | (0.055) | (0.065) | (0.059) | (0.061) | (0.073) |
| Observations | 1012 | 960 | 765 | 848 | 796 | 665 |
| Adj. R2 | 0.277 | 0.279 | 0.344 | 0.354 | 0.361 | 0.386 |
| Number of countries | 63 | 61 | 37 | 54 | 52 | 35 |
| Country-Year-Semester FE | Yes | Yes | Yes | Yes | Yes | Yes |
| **Dependent variable**: $\Delta r_{t+4}$ | | | | | | |
| $E_t(g_{t+2})$ | 0.195*** | 0.222*** | 0.351*** | 0.191*** | 0.215*** | 0.232*** |
| | (0.066) | (0.068) | (0.076) | (0.065) | (0.065) | (0.077) |
| Observations | 914 | 866 | 700 | 770 | 722 | 611 |
| Adj. R2 | 0.343 | 0.347 | 0.426 | 0.434 | 0.446 | 0.466 |
| Number of countries | 63 | 61 | 37 | 53 | 51 | 36 |
| Country-Year-Semester FE | Yes | Yes | Yes | Yes | Yes | Yes |

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.010$

SOURCE: Author's estimates.

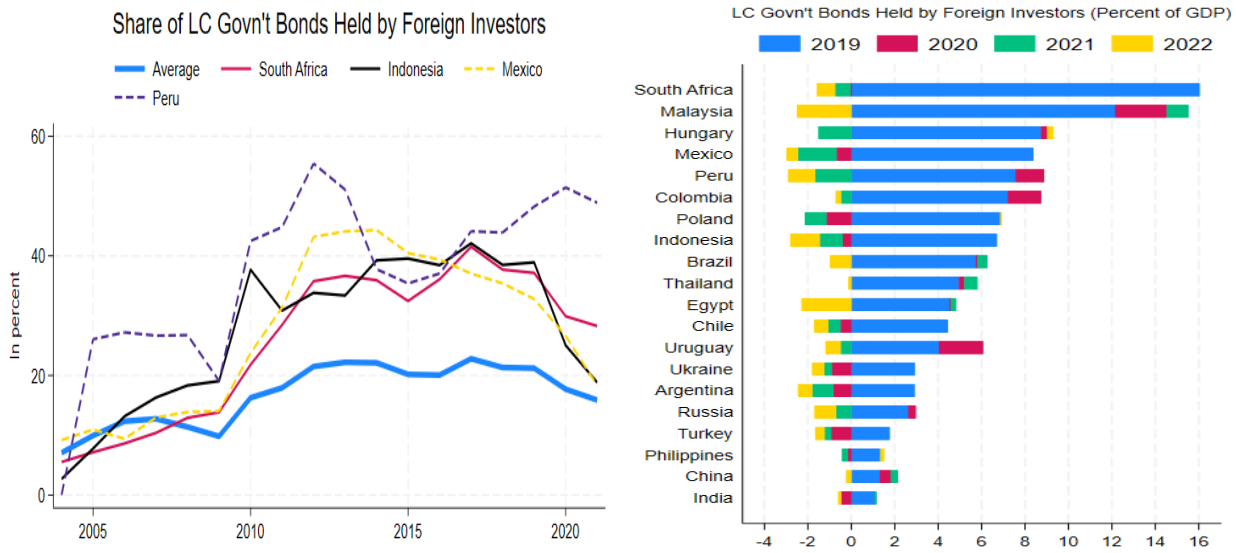
NOTE: Heteroskedasticity-robust standard errors in parentheses

FIGURE 1: Level of Debt Held by Domestic and Foreign Private Creditors in EMDEs (in percent of GDP, excluding China)



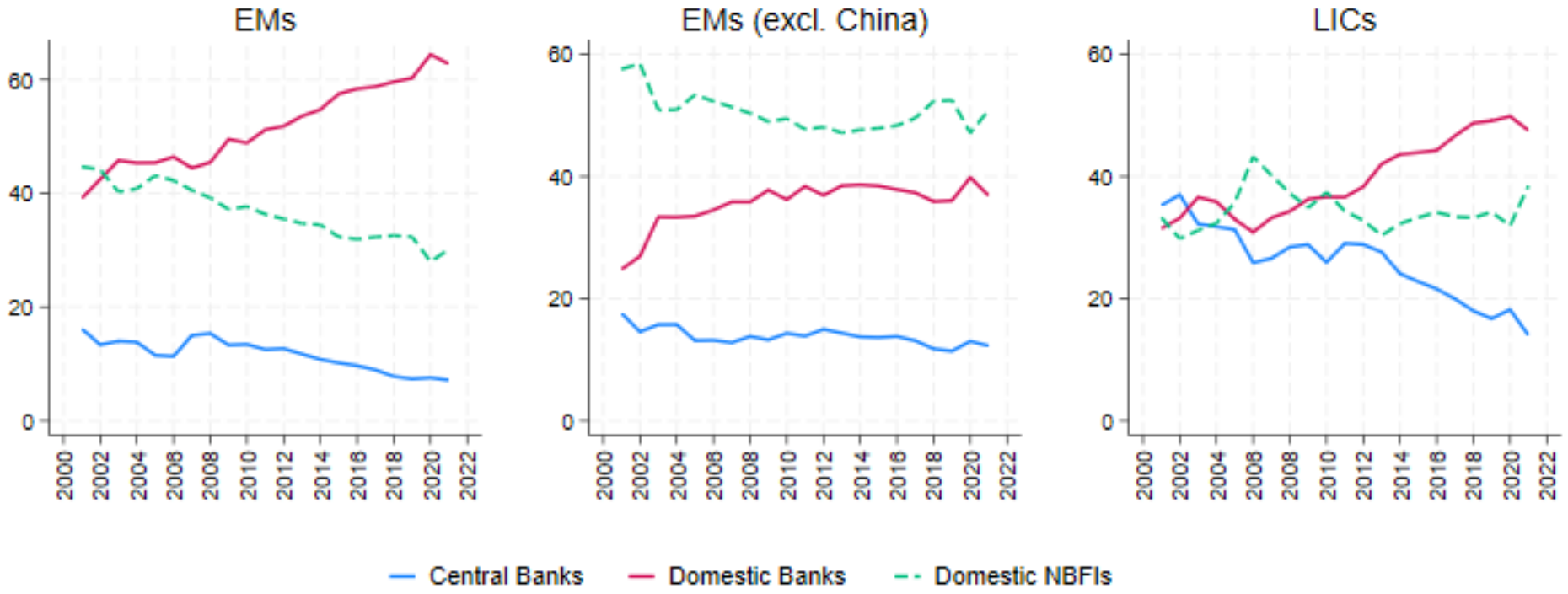

Source: Arslanalp and Tsuda (2014) and author's estimates.
Note: The charts show GDP-weighted average by income groups.

FIGURE 2: Local-Currency Denominated Government Bonds Held by Foreign Investors



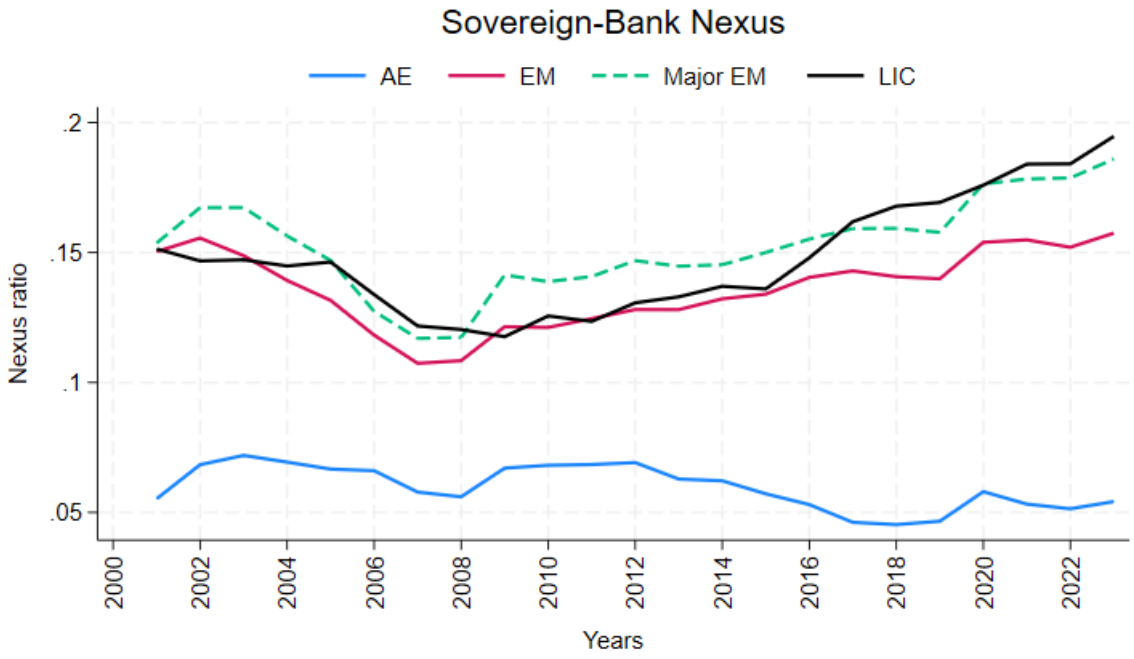

Source: Arslanalp and Tsuda (2014) and author's estimates.

FIGURE 3: Share of Sovereign Debt Held by Each Domestic Creditors (In Percent)




Source: Arslanalp and Tsuda (2014) and author's estimates.
Note: The charts show GDP-weighted average by income groups.

FIGURE 4: Evolution of Sovereign-Bank Nexus




Source: IMF Monetary and Financial Statistics, and author's estimates.
Note: The nexus ratio shows banks' exposure to sovereign debt (covering general government and SOEs, in form of loans or government security holdings) as a share of banking sector assets. The chart shows a simple average by income groups.

FIGURE 5: Cumulative Response of 5-Year and 10-Year Bond Yields to Higher Expected Primary Deficits: All EMDEs (excl. China/India) vs. Major Bond Issuers in EMDEs (in percentage)

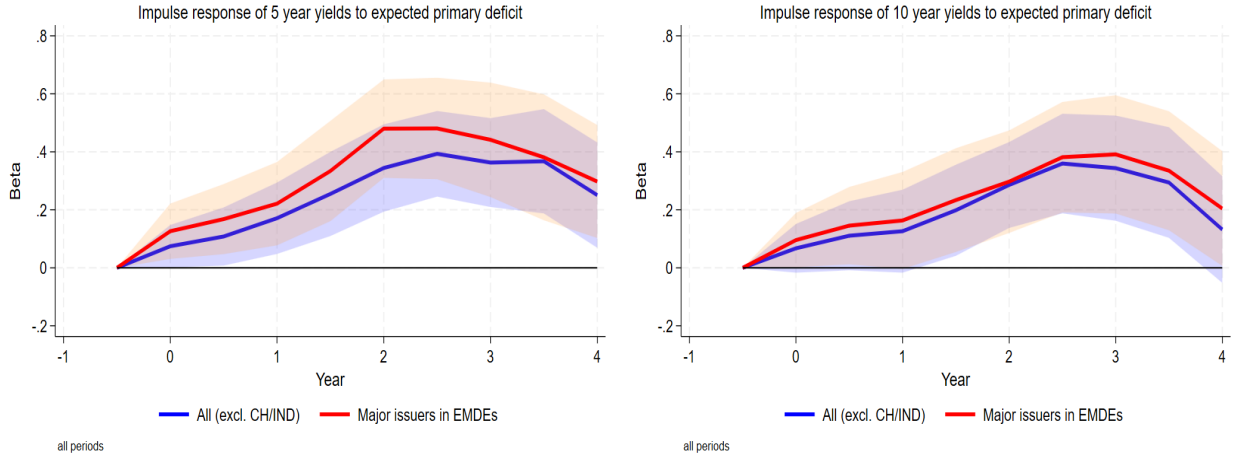
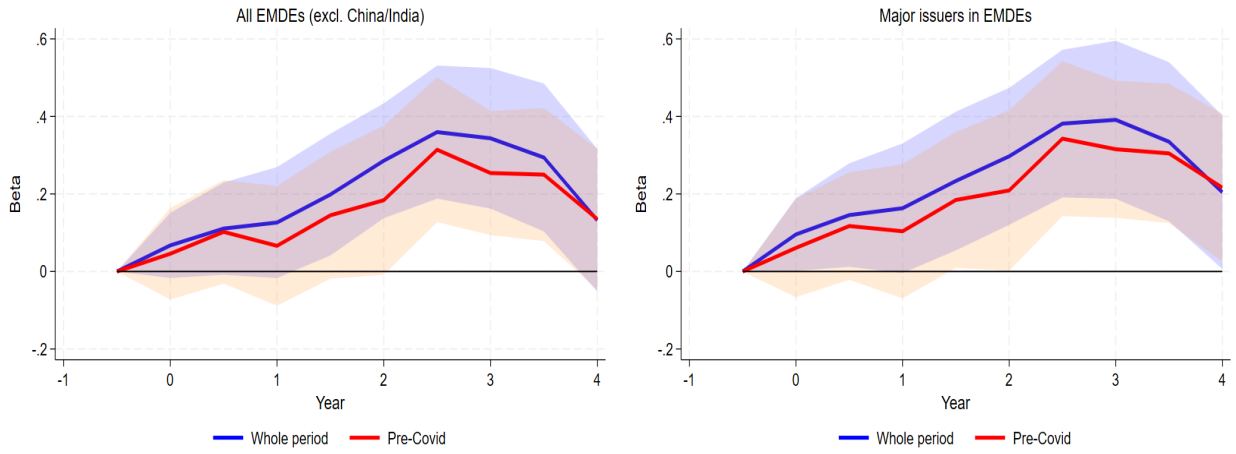



FIGURE 6: Cumulative Response of 10-Year Bond Yields to Higher Expected Primary Deficits: Whole Period vs. Pre-Covid Period (in percentage)

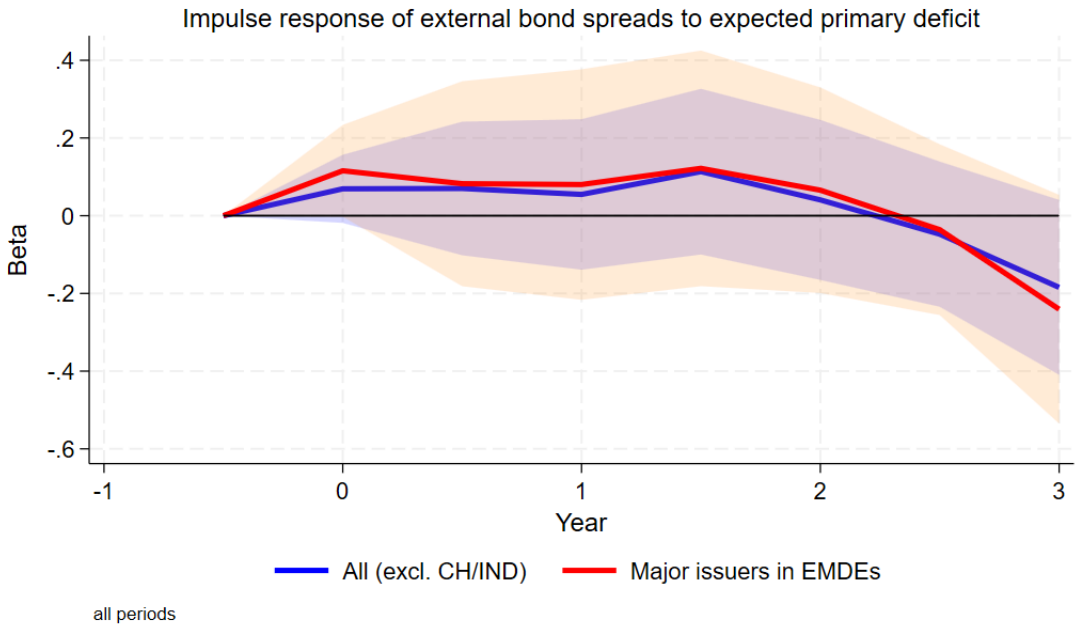



Source: Bloomberg, WEO, Haver, and author's estimates.

Note: 95 percent confidence intervals using heteroskedasticity-robust standard errors are shown in shaded areas. The regression uses the amount of new long-term sovereign bond issuances as weight. "Major issuers in EMDEs" include 36 countries with frequent bond issuances in the analysis data.[a]

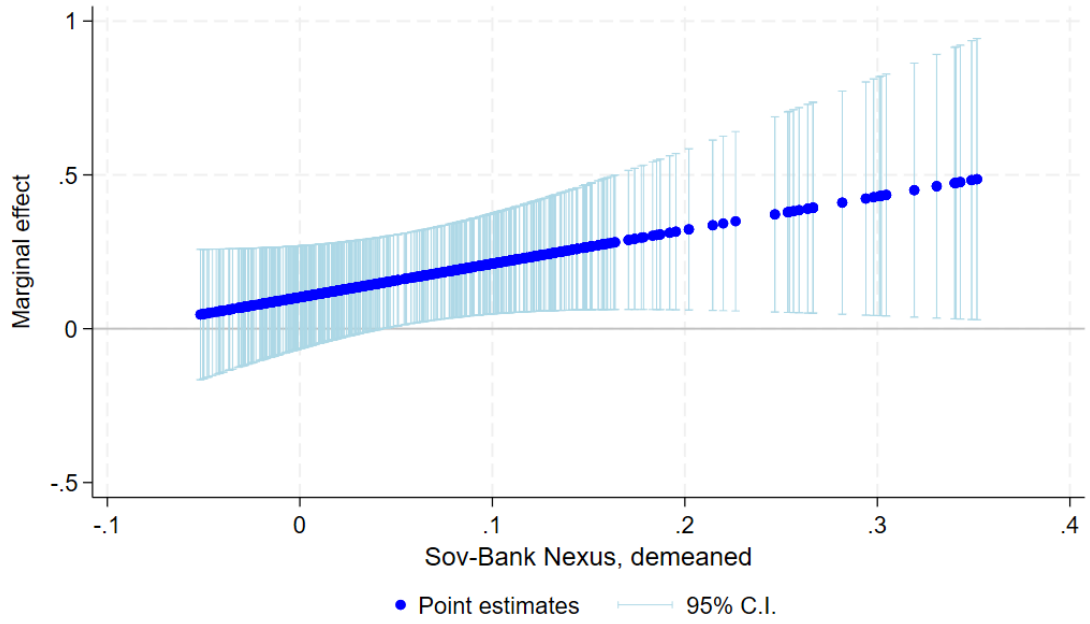
[a] 36 major bond issuers in EMDEs include Botswana, Brazil, Bulgaria, Chile, Colombia, Costa Rica, Dominican Republic, Egypt, Georgia, Ghana, Indonesia, Jamaica, Kenya, Malaysia, Mauritius, Mexico, Morocco, Namibia, Nigeria, Pakistan, Peru, Philippines, Poland, Romania, Russia, Saudi Arabia, South Africa, Sri Lanka, Thailand, Trinidad and Tobago, Turkey, Uganda, Ukraine, Uruguay, Vietnam, and Zambia.

FIGURE 7: Cumulative Response of External Bond Spreads to Higher Expected Primary Deficits (in percentage)



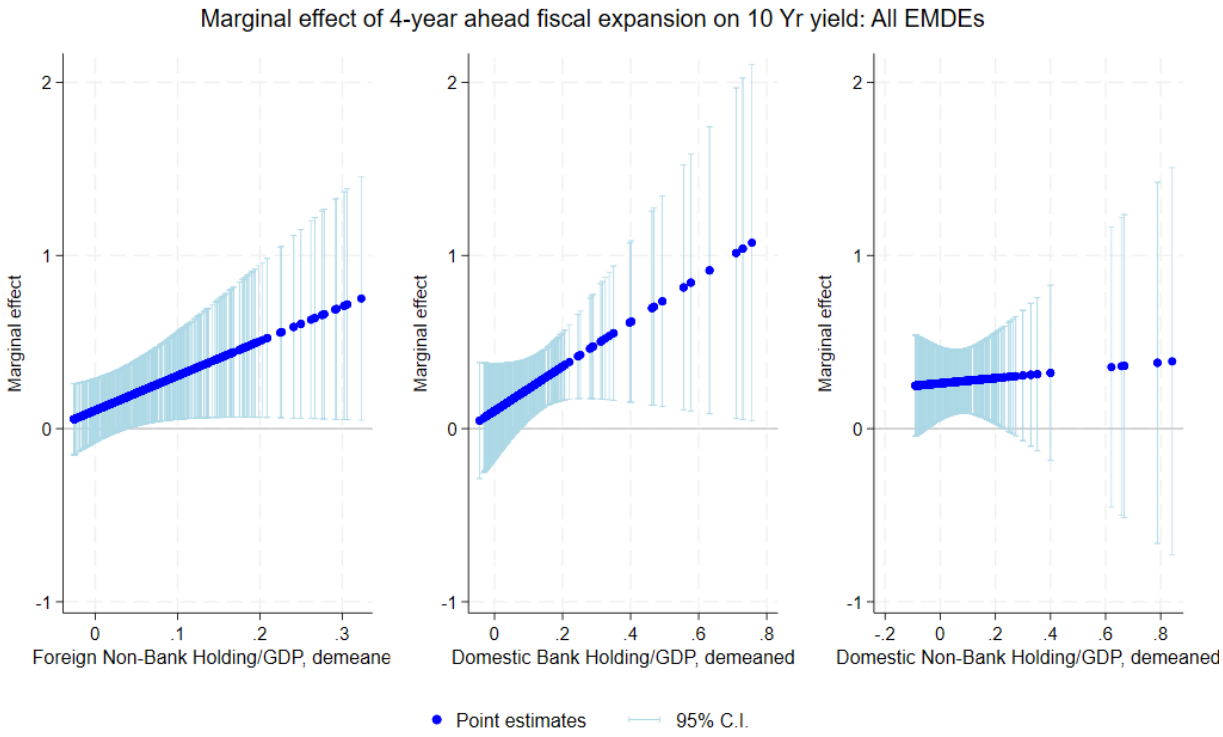

Source: Bloomberg, IMF, Haver, and author's estimates.
Note: 95 percent confidence intervals using heteroskedasticity-robust standard errors are shown in shaded areas. The regression uses the amount of new long-term sovereign bond issuances as weight.

FIGURE 8: Marginal Effect of 4-year Ahead Primary Deficits on 10-Year Bond Yield Heterogeneity by Sovereign-Bank Nexus (All EMDEs, excluding China/India)



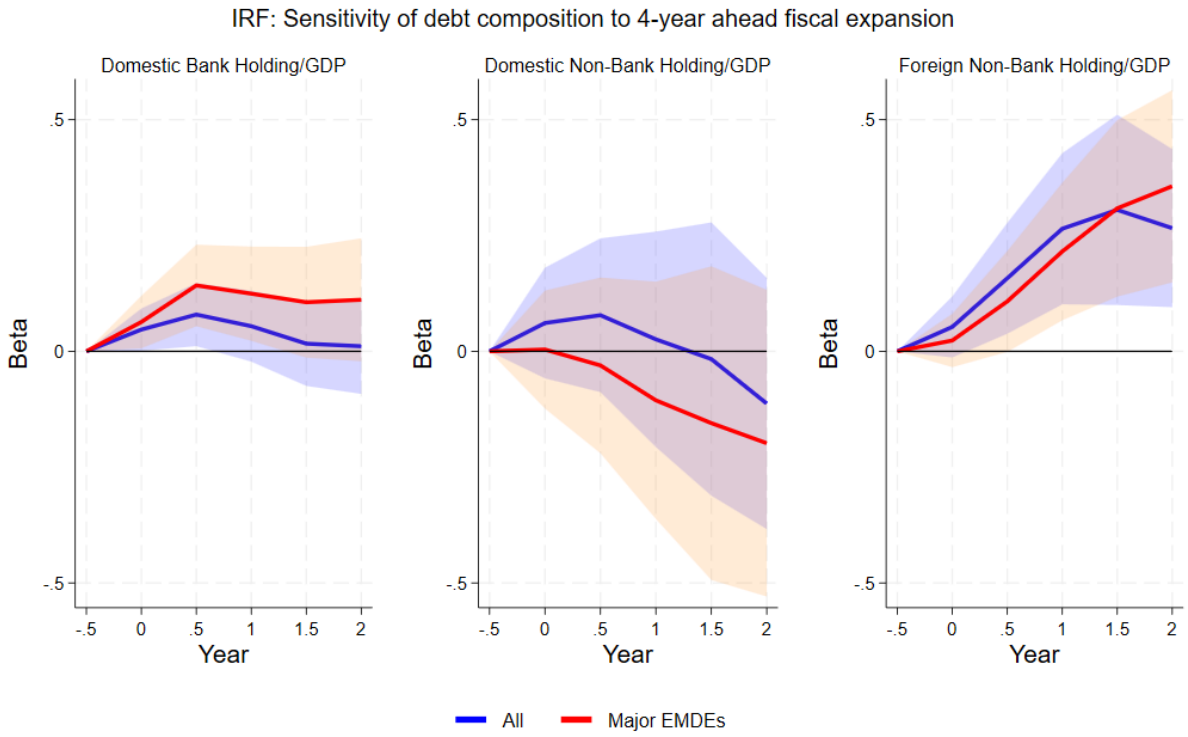

Source: Bloomberg, IMF, Haver, and author's estimates.
Note: Estimates indicate cumulative impact over two years. 95 percent confidence intervals using heteroskedasticity robust standard errors are shown in error bars. Sovereign-bank nexus is measured by the holding of domestic sovereign bonds as a share of banking sector's total assets.

FIGURE 9: Marginal Effect of 4-year Ahead Primary Deficits on 10-Year Bond Yield Heterogeneity by Debt Holders (All EMDEs, excluding China/India)



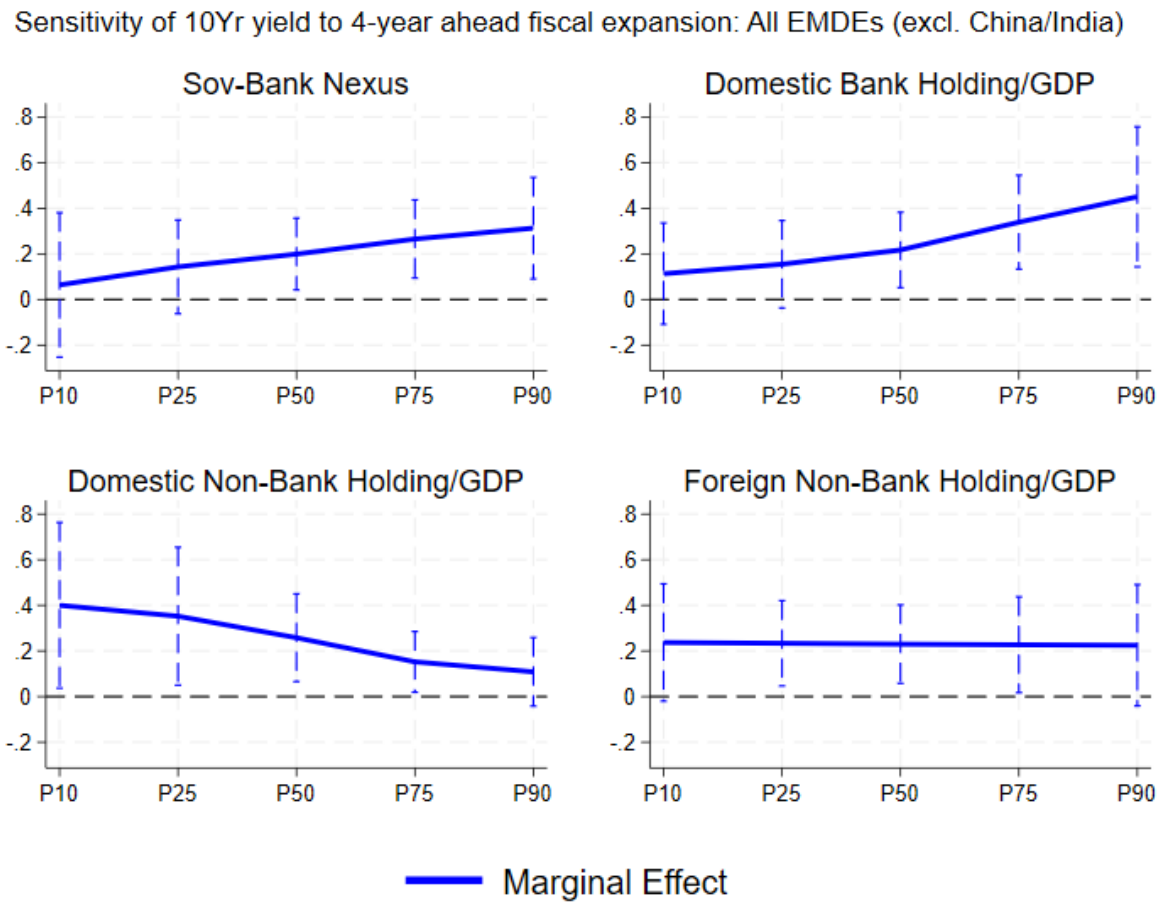

Source: Bloomberg, IMF, Haver, Arslanalp and Tsuda (2014), and author's estimates.
Note: Estimates indicate cumulative impact over two years. 95 percent confidence intervals using heteroskedasticity robust standard errors are shown in error bars.

FIGURE 10: Cumulative Response of Debt Composition to Expected Fiscal Expansion (First-stage Results, In Percent of GDP)




Source: Bloomberg, IMF, Haver, Arslanalp and Tsuda (2014), and author's estimates.
Note: $\varphi$ (y-axis) is the impact of 1 percentage point of GDP increase in 4-year ahead primary deficits on sovereign debt holding of each type of creditor (in percent of GDP). The estimates indicate cumulative impact over two years. 95 percent confidence intervals using heteroskedasticity-robust standard errors are shown in shaded areas. All EMDEs (blue line) excludes China and India.

FIGURE 11: Sensitivity of 10 Year Yields to 4-Year Ahead Fiscal Deficits: Heterogeneity by Financing Sensitivity Proxy (Second-stage Results) for all EMDES excluding China and India




Source: Bloomberg, IMF, Haver, Arslanalp and Tsuda (2014), and author's estimates.
Note: 95 percent confidence intervals using heteroskedasticity-robust standard errors are shown in error bars. Estimates indicate cumulative impact over two years.

# Appendix

## Annex A List of EMDEs in the Analysis Sample

TABLE A1: A Country List in the Baseline Analysis Sample

| Country | 10-Year Bond Rate (%) | Primary Deficit/GDP (t+4) | Public Debt/GDP (t+4) | External Bond Spread (bps) |
|---|---|---|---|---|
| Albania | 6.35 | 0.35 | 66.73 | 340.7 |
| Angola | 7.72 | -1.82 | 67.15 | 538.1 |
| Argentina | 8.70 | 1.02 | 52.93 | 424.1 |
| Armenia | 12.32 | 0.15 | 50.25 | 338.0 |
| Bahamas, The | 4.14 | -1.33 | 70.25 | 449.7 |
| Bangladesh | 8.58 | 1.93 | 39.32 | … |
| Bolivia | 2.45 | 2.52 | 54.74 | 335.4 |
| Bosnia and Herzegovina | 3.11 | -0.98 | 35.94 | … |
| Botswana | 5.79 | -1.45 | 15.24 | … |
| Brazil | 7.19 | -2.77 | 85.98 | 223.0 |
| Bulgaria | 2.65 | -0.67 | 21.90 | 138.4 |
| Cabo Verde | 4.04 | -0.57 | 123.74 | … |
| Chile | 4.33 | -0.43 | 25.27 | 87.8 |
| China | 3.63 | 2.39 | 53.46 | 61.4 |
| Colombia | 7.36 | -1.92 | 44.08 | 206.7 |
| Costa Rica | 8.37 | -0.73 | 63.56 | 461.5 |
| Côte d'Ivoire | 5.91 | 1.27 | 45.59 | 637.1 |
| Dominican Republic | 10.64 | -0.45 | 49.56 | 364.7 |
| Egypt | 15.83 | -1.10 | 90.41 | 496.6 |
| Georgia | 10.20 | 0.63 | 40.26 | 302.9 |
| Ghana | 21.25 | -0.96 | 76.91 | 882.1 |
| Honduras | 8.30 | -1.33 | 49.06 | 375.4 |
| India | 9.42 | 2.36 | 76.46 | … |
| Indonesia | 7.43 | 0.46 | 31.95 | 176.3 |
| Jamaica | 8.02 | -7.19 | 98.72 | 397.1 |
| Jordan | 5.71 | -1.43 | 86.30 | 425.0 |
| Kazakhstan | 8.15 | -1.52 | 23.89 | 147.4 |
| Kenya | 12.70 | 0.96 | 59.64 | 518.2 |
| Kuwait | 13.27 | -1.59 | 45.74 | 54.5 |
| Lebanon | 7.67 | -0.97 | 145.85 | 550.9 |
| Malawi | 21.34 | 0.49 | 77.42 | … |
| Malaysia | 3.92 | 0.72 | 60.47 | … |
| Mauritius | 5.58 | 0.50 | 71.07 | … |
| Mexico | 6.62 | -0.95 | 54.81 | 161.4 |
| Morocco | 3.20 | 0.66 | 68.11 | 206.6 |
| Namibia | 9.69 | 0.95 | 59.97 | 314.8 |
| Nigeria | 13.29 | 1.87 | 29.64 | 494.2 |
| Oman | 4.80 | 4.37 | 50.01 | 417.9 |
| Pakistan | 10.87 | -0.41 | 71.54 | 741.1 |
| Peru | 5.21 | -0.77 | 26.17 | 136.4 |
| Philippines | 4.90 | -0.61 | 42.81 | 111.0 |
| Poland | 3.55 | 0.61 | 54.93 | 77.4 |

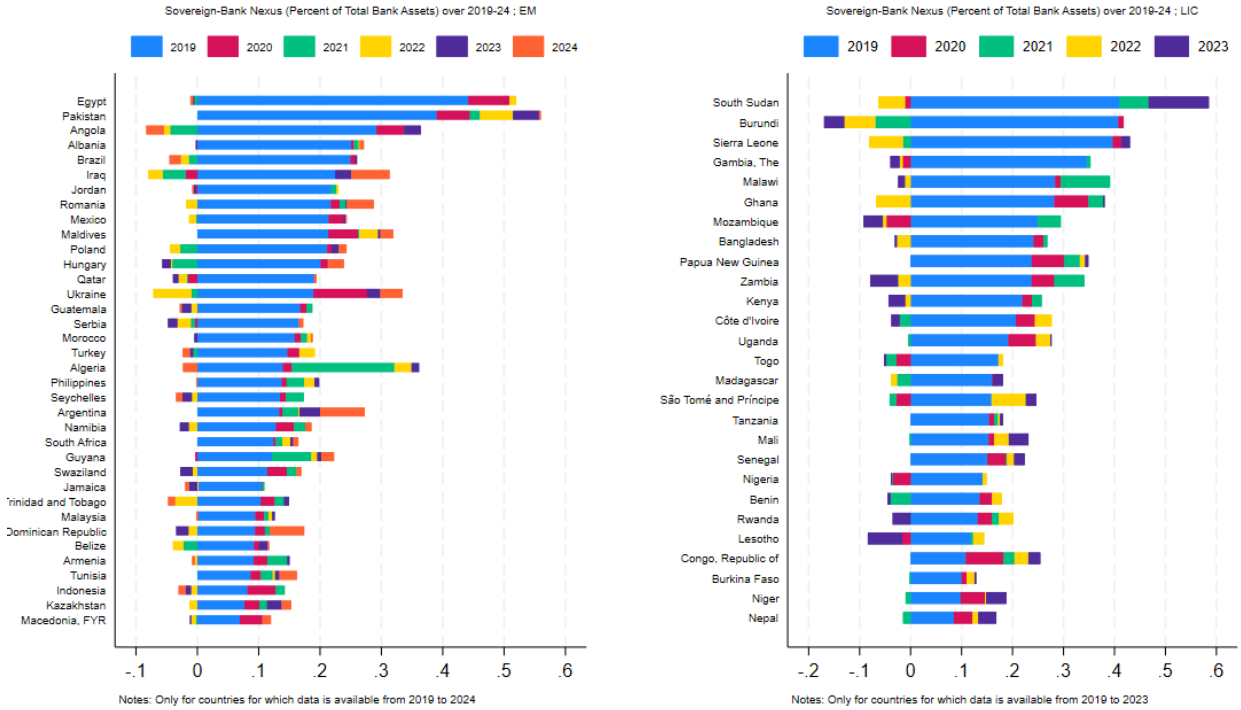
| Country | 10-Year Bond Rate (%) | Primary Deficit/GDP (t+4) | Public Debt/GDP (t+4) | External Bond Spread (bps) |
|---|---|---|---|---|
| Romania | 5.29 | 1.65 | 46.64 | 227.1 |
| Russia | 8.00 | 0.13 | 17.72 | 458.8 |
| Saudi Arabia | 2.92 | 1.55 | 34.98 | 141.0 |
| South Africa | 7.54 | -0.21 | 64.60 | 265.7 |
| Sri Lanka | 10.74 | -0.20 | 89.56 | 820.4 |
| Eswatini | 10.52 | 0.55 | 52.74 | ... |
| Tanzania | 12.31 | 0.64 | 42.27 | ... |
| Thailand | 2.71 | 0.54 | 50.64 | ... |
| Trinidad and Tobago | 4.25 | 3.24 | 69.94 | 199.0 |
| Tunisia | 8.05 | -1.25 | 79.28 | 981.7 |
| Turkey | 7.46 | -0.20 | 40.24 | 365.5 |
| Uganda | 15.71 | 0.81 | 46.32 | ... |
| Ukraine | 12.85 | -0.51 | 51.75 | 734.2 |
| Uruguay | 6.39 | -0.82 | 66.78 | 171.1 |
| Venezuela | 12.16 | 6.65 | 90.05 | ... |
| Vietnam | 5.94 | 2.41 | 59.27 | 193.6 |
| Zambia | 23.23 | -0.39 | 72.87 | 1526.0 |
| **Total** | **8.31** | **0.12** | **58.19** | **384.3** |

Source: Bloomberg, IMF, and author's estimates.

Note: Statistics are the sample average. Shaded countries are included in major (frequent) bond issuers in EMDEs sample.

# Annex B Sovereign-Bank Nexus: Country-level Evidence

FIGURE A1: Change in the Sovereign-Bank Nexus (In Percent of Total Bank Assets)




((a)) Emerging Market Countries, over 2019-24 ((b)) Low-Income Countries, over 2019-23

Source: IMF Monetary and Financial Statistics (MFS), and author's estimates.

## Annex C The Model

The relationship between fiscal policy and long-term interest rates has been examined through complementary theoretical perspectives. Laubach (2009) presents a reduced-form empirical framework in which expected fiscal deficits and debt accumulation raise the natural interest rate through a neoclassical crowding-out mechanism: increased government borrowing requirements exert upward pressure on real interest rates. In this view, fiscal fundamentals shift the natural rate, which is then transmitted to observed long-term yields.

Subsequent structural models formalize this mechanism within general equilibrium settings. Davig and Leeper (2011) incorporate fiscal variables into a New Keynesian Ramsey-type model that allows regime switching between monetary and fiscal dominance. In their setup, fiscal expansions can alter the natural rate of interest directly, with the transmission depending on the prevailing regime—raising inflation expectations under fiscal dominance or real rates under monetary dominance. Similarly, Bianchi *et al.* (2023) develop a heterogeneous-agent general equilibrium framework in which partially unfunded public debt influences households' savings decisions, thereby lowering equilibrium savings and increasing both the natural rate and inflation. In both cases, fiscal sustainability plays a central role in determining equilibrium real rates, extending Laubach's reduced-form intuition into a dynamic environment.

To guide the interpretation of empirical results, this annex develops a tractable framework linking fiscal expectations to domestic sovereign yields through two mechanisms: (a) an FTPL-type inflation expectation channel and (b) a bond-supply (term-premium) channel following preferred-habitat view (Vayanos and Vila (2021)). The framework also incorporates a sovereign–bank nexus, which amplifies yield responses via macro-financial feedback loops.

### 1 Set-up

Let $g_t$ denote the primary deficit-to-GDP ratio (positive for deficits), $b_{t-1}$ the public debt-to-GDP ratio outstanding at the start of period $t$, and $\rho \in (0, 1]$ the rollover rate. Over a finite forecast window of $K$ periods (e.g., $K = 4$ years), the discounted sum of expected

primary fiscal deficits over that window ($G_t^{(K)}$) is:

$$G_t^{(K)} \equiv \sum_{k=0}^{K} \beta^k E_t[g_{t+k}], \qquad \beta \in (0,1) \tag{8}$$

and the duration-adjusted net supply of sovereign bonds ($d_t$) is expressed as follows:

$$d_t \equiv g_t + \rho b_{t-1} \tag{9}$$

Eq. (9) is expressed in present-value term as:

$$D_t \equiv \sum_{k=0}^{K} \beta^k E_t[d_{t+k}] = G_t^{(K)} + \frac{\rho}{1-\beta} b_{t-1} \tag{10}$$

A fraction $\lambda_t \in [0,1]$ of this debt is absorbed by domestic investors, while the remainder is financed externally.

## 2 Domestic debt block

Domestic bonds of maturity $n$ pay the yield $y_t^D(n)$, which can be decomposed into the expected average short-term rate and a maturity-specific term premium:

$$y_t^D(n) \;=\; \frac{1}{n} \sum_{k=0}^{n-1} E_t[i_{t+k}] \;+\; \mathrm{TP}_t^D(n) \tag{11}$$

**FTPL inflation expectation channel** The short-term nominal interest rate at time $t+k$ follows Fisher's relation:

$$i_{t+k} \;\approx\; r^*_{t+k} + E_t[\pi_{t+k}] \tag{12}$$

where $r^*_{t+k}$ is the natural real rate and $E_t[\pi_{t+k}]$ the expected inflation rate.

Under fiscal dominance, fiscal expectations directly influence inflation expectations, as in the Fiscal Theory of the Price Level (FTPL) (Sargent and Wallace (1981); Leeper (1991)):

$$E_t[\pi_{t+k}] = \bar{\pi} + E_t[g_{t+k}] + v_{t+k} \tag{13}$$

where $\bar{\pi}$ is steady-state inflation (i.e., baseline inflation expectation). From eq. (12) and

(13), the average of expected short-term rates over maturity horizon $n$ yields:

$$\frac{1}{n}\sum_{k=0}^{n-1} E_t[i_{t+k}] = \bar{\imath}_t^{(n)} + \frac{1}{n}\sum_{k=0}^{n-1} E_t[g_{t+k}] + \xi_t^{(n)} \tag{14}$$

where $\bar{\imath}_t^{(n)}$ is the baseline short-rate path: $\bar{\imath}_t^{(n)} = r^*_{t+k} + \bar{\pi}$. The impact of fiscal expectations on inflation (the second term) is diluted by averaging over the horizon $n$. Thus, the FTPL contribution is stronger for shorter maturities and weaker for longer ones.

**Bond-supply (term-premium) channel** Fiscal expansions also influence yields through changes in the term premium, reflecting increased expected net bond supply with maturity $n$:

$$\mathrm{TP}_t^D(n) = \underbrace{\alpha\,\lambda_t\left(G_t^{(K)} + \frac{\rho}{1-\beta} b_{t-1}\right)}_{\text{term premium}} + \gamma Z_t \tag{15}$$

where $\alpha$ measures the slope of the preferred-habitat demand curve, $\lambda_t$ captures domestic market absorption, and $Z_t$ denotes global or domestic risk factors. A higher value of $\lambda_t$ indicates that a larger share of sovereign debt must be absorbed by domestic investors, implying a tighter and shallower domestic bond market with limited absorption capacity, whereas a lower $\lambda_t$ reflects a more diversified financing sources and greater market capacity to absorb sovereign issuance.

Larger expected primary deficits and refinancing pressure raise premia. The preferred-habitat model (Modigliani and Sutch (1966); Greenwood and Vayanos (2014); Vayanos and Vila (2021)) implies that the term premium rises with the supply of sovereign bonds measured in duration terms. In other words, as the government issues more long-maturity debt, investors must absorb a greater amount of duration risk. The sensitivity of the term premium to the supply of longer-duration domestic bonds is represented by a slope parameter $\alpha > 0$. A higher $\alpha$ indicates that the bond market is less able to absorb additional duration risk– typically in developing countries with a shallow investor base or limited risk-bearing capacity – so the term premium rises sharply. Conversely, a lower $\alpha$ characterizes deeper, more diversified bond market where additional issuance is absorbed with minimal price impact. Other non-fiscal risk factors – such as global risk sentiment, financial market volatility, or FX depreciation – are captured separately in $Z_t$.

**Sovereign–bank nexus** When banks hold large sovereign exposures, valuation losses feed back into sovereign risk (Brunnermeier *et al.* (2016)). Due to the "doom-loop", domestic banks' sovereign holdings amplify yield responses through a sovereign–bank nexus. This amplification is represented by an adjustment factor $(1 - \kappa s_{b,t}(n))^{-1}$, $\kappa \in (0,1)$. where $s_{b,t}(n)$ is the share of maturity-$n$ bonds held by banks. $\kappa$ measures the strength of macro-financial risk due to the negative feedback loop between banks and the sovereign.

**Domestic bond yield equation** Combining eqs (11), (14) and (15) yields:

$$y_t^D(n) = \frac{\bar{\iota}_t^{(n)} + \frac{1}{n}\sum_{k=0}^{n-1} E_t[g_{t+k}] + \alpha\,\lambda_t\left(G_t^{(K)} + \frac{\rho}{1-\beta} b_{t-1}\right) + \gamma Z_t}{1 - \kappa s_{b,t}(n)} \tag{16}$$

## 3 Eurobond block

For Eurobonds issued in foreign currency under international law, yields primarily reflect global financial conditions rather than domestic fiscal dynamics:

$$y_t^E(n) = r_t^*(n) + \mu_1(1-\lambda_t)G_t^{(K)} + \mu_2 X_t + \mu_3 \tau_t + \mu_4 \Phi_t \tag{17}$$

where $r_t^*(n)$ is the global safe rate, $X_t$ global risk (e.g., VIX or EMBI), $\tau_t$ sovereign credit risk, and $\Phi_t$ a currency premium. The parameter $\mu_1$ is typically small, indicating that fiscal news mainly affects external yields through credit and currency channels.

## 4 Comparative statics

Let us consider a policy shock in increasing expected primary fiscal deficits. Holding other covariates fixed and from eq. (16), the elasticity of domestic bond yields is:

$$\frac{\partial y_t^D(n)}{\partial G_t^{(K)}} = \frac{\alpha\lambda_t + \frac{1-\beta}{n}}{1 - \kappa s_{b,t}(n)} > 0 \tag{18}$$

Hence larger expected deficits raises domestic yields; higher bank exposure magnifies all effects. Similarly, the elasticity of eurobond yields is:

$$\frac{\partial y_t^E(n)}{\partial G_t^{(K)}} = \mu_1(1-\lambda_t) + \mu_3\frac{\partial \tau_t}{\partial G_t^{(K)}} + \mu_4\frac{\partial \Phi_t}{\partial G_t^{(K)}}, \qquad \frac{\partial y_t^E(n)}{\partial r_t^*(n)} \approx 1, \qquad \frac{\partial y_t^E(n)}{\partial X_t} = \mu_2$$

While domestic yields exhibit greater fiscal sensitivity, eurobond yields are primarily

anchored by global conditions ($r_t^*$, $X_t$), with fiscal news loading mainly through credit and currency premia ($\tau_t$, $\Phi_t$).

## 5 Testable hypotheses

The unified framework presented in this section implies three testable hypotheses that map to our empirical analyses in the section 4 and 5:

**H1 (Baseline).** Rise in expected primary deficits affects domestic yields through both FTPL (inflation-expectation) and bond-supply (term-premium) channels, with sensitivity magnified by stronger sovereign–bank linkages ($s_{b,t}$).

$$\frac{\partial y_t^D(n)}{\partial G_t^{(K)}} = \frac{\alpha\lambda_t + \frac{1-\beta}{n}}{1 - \kappa s_{b,t}(n)} > 0$$

Countries with weaker domestic absorption capacity (high $\lambda_t$) and less diversified resident investor bases (higher $\kappa$) should exhibit higher sensitivity of yields to fiscal expectations. The sensitivity of yield also increases when investors' demand is more elastic to fiscal shocks ($\alpha > 0$).

**H2 (Maturity structure).** The contribution of fiscal expectations to yields diminishes with maturity $1/n$, implying that shorter-term bonds respond more strongly to fiscal news. The cross-partial derivative with $n$ indicates:

$$\frac{\partial^2 y_t^D(n)}{\partial G_t^{(K)} \partial n} = \frac{-\frac{(1-\beta)}{n^2}\left(1 - \kappa\, s_{b,t}(n)\right) \;+\; \kappa\, s'_{b,t}(n)\left(\alpha\lambda_t + \frac{1-\beta}{n}\right)}{\left(1 - \kappa\, s_{b,t}(n)\right)^2}$$

If the bank's sovereign bond profile is flat ($s'_{b,t}(n) = 0$), $\frac{\partial^2 y_t^D(n)}{\partial G_t^{(K)} \partial n} < 0$. In case the bank's sovereign bond holding is skewed to shorter-maturity ($s'_{b,t}(n) < 0$), with non-banks holding more longer-maturity bonds, $\frac{\partial^2 y_t^D(n)}{\partial G_t^{(K)} \partial n} < 0$. This implies greater sensitivity of domestic yields to fiscal shock at shorter maturity bonds.

**H3 (Investor base heterogeneity).** Fiscal sensitivity rises when banks dominate sovereign debt holdings. The cross-partial derivative below confirms the amplification effect of con-

centrated bank exposure.

$$\frac{\partial^2 y_t^D(n)}{\partial G_t^{(K)} \partial s_{b,t}(n)} = \frac{\kappa \left( \alpha \lambda_t + \dfrac{1-\beta}{n} \right)}{\left(1 - \kappa\, s_{b,t}(n)\right)^2} \; > \; 0$$

In general, the yield sensitivity would vary by (a) the concentration of domestic bonds at each maturity $s_{i,t}(n)$ held by specific investors and (b) the macro-financial risk posed by each investor where $i \in$ {domestic banks, non-banks, foreign investors}.

## Annex D Dynamic Implication

A forward-looking extension considers how markets price expected fiscal expansion at future horizons. Let $K$ denotes the timing of the market-anticipated fiscal expansion (observed at time $t$).

### 1 Starting point

Annex C established the following decomposition of the $n$-maturity domestic yield:

$$y_t^D(n) \;=\; \frac{\bar{\iota}_t^{(n)} + \frac{1}{n}\sum_{k=0}^{n-1} E_t[g_{t+k}] + \alpha\,\lambda_t\left(G_t^{(K)} + \frac{\rho}{1-\beta}b_{t-1}\right) + \gamma Z_t}{1-\kappa s_{b,t}(n)}$$

where $g_t$ denotes the primary balance-to-GDP ratio (positive for deficits). $G_t^{(K)} \equiv \sum_{k=0}^{K}\beta^k E_t[g_{t+k}]$ is the present value of expected future deficits, $s_{b,t}(n)$ is the bank share of sovereign bonds with maturity $n$, $\lambda_t$ denotes market depth, and $\kappa$ captures sovereign–bank amplification.

Suppose that at time $t$ markets learn that the primary deficit will increase by $\delta$ in period $K$. Formally,

$$\Delta_K g_{t+K} = \delta, \qquad \Delta_K G_t = \beta^K \delta \tag{19}$$

### 2 $h$-period-ahead impact

Domestic yields respond to the fiscal shock $\delta$ at horizon $h$ as follows:

$$\Delta y_{t+h}^D(n) \;\approx\; \frac{1}{1-\kappa\bar{s}_b^{(n)}}\left[\frac{1}{n}\mathbf{1}\{0 \le K-h \le n-1\} + \alpha\,\bar{\lambda}\,\beta^{K-h}\mathbf{1}\{0 \le h \le K\}\right]\delta \tag{20}$$

where $(\bar{s}_b^{(n)}, \bar{\lambda})$ are the time averages. The first term corresponds to the FTPL (short-rate) channel, active when the fiscal expansion overlaps with the bond's maturity horizon $n$. The second term captures the present-value adjustment in term premia, which intensifies as the forecasted deficit date $K$ approaches. Both channels are amplified by the sovereign–bank nexus.

## 3 LP-based cumulative response

Define the cumulative impulse response (CIRF) at horizon $h$ relative to baseline $t-1$ as

$$CIRF_h^{(n)} \equiv y_{t+h}^D(n) - y_{t-1}^D(n) \;\approx\; \sum_{j=0}^{h} \Delta y_{t+j}^D(n)$$

Hence the sensitivity to news is

$$\Gamma_h^{(n)}(K) \equiv \frac{\partial CIRF_h^{(n)}}{\partial \delta} \;\approx\; \frac{1}{1-\kappa\,\bar{s}_b^{(n)}} \left[\frac{1}{n}\,\phi_h^{\mathrm{SR}}(K) + \alpha\,\bar{\lambda}\,\phi_h^{\mathrm{TP}}(K)\right] \tag{21}$$

The weighting functions are defined as

$$\phi_h^{\mathrm{SR}}(K) = \sum_{j=0}^{h} \omega_j^{SR}\,\mathbf{1}\{0 \le K-j \le n-1\},$$

$$\phi_h^{\mathrm{TP}}(K) = \sum_{j=0}^{h} \omega_j^{\mathrm{TP}}\,\beta^{K-j}\,\mathbf{1}\{0 \le j \le K\}$$

Intuitively, $\phi_h^{\mathrm{SR}}(K)$ captures the extent to which fiscal news overlaps with the short-rate averaging window, while $\phi_h^{\mathrm{TP}}(K)$ measures how strongly the anticipated future bond supply is priced into the term premium. The coefficients $\omega_j^{SR}$ and $\omega_j^{TP}$ represent the relative contribution of each lead $j$ to these channels.

The dynamics implied by eq. (21) are as follows: (a) the response is hump-shaped in $h$, typically peaking 2–3 years after the news; (b) shorter maturities (e.g., $n = 5$) react more strongly initially via the FTPL channel, whereas longer maturities (e.g., $n = 10$) load relatively more on the term premium; and (c) stronger sovereign–bank nexus shifts the entire response upward and forward.

Together, these dynamic predictions provide additional testable implications beyond the static comparative statics in Annex C.

# Annex E Baseline Local Projection Estimates

TABLE A2: Determinants of the Change in Sovereign Bond Yields (in percentage)

| | (1) 5 Year Yield | | | (2) 10 Year Yield | | |
|---|---|---|---|---|---|---|
| | ALL | Excl CHN/IND | Major issuers | ALL | Excl CHN/IND | Major issuers |
| **Dependent variable**: $\Delta r_t$ | | | | | | |
| $E_t(g_{t+4})$ | 0.067* | 0.074** | 0.126*** | 0.060 | 0.067 | 0.096** |
| | (0.036) | (0.037) | (0.049) | (0.040) | (0.043) | (0.048) |
| Observations | 1046 | 994 | 765 | 856 | 804 | 664 |
| Adj. R2 | 0.166 | 0.166 | 0.161 | 0.114 | 0.119 | 0.162 |
| Number of countries | 65 | 63 | 37 | 56 | 54 | 36 |
| Country-Year-Semester FE | Yes | Yes | Yes | Yes | Yes | Yes |
| **Dependent variable**: $\Delta r_{t+2}$ | | | | | | |
| $E_t(g_{t+4})$ | 0.152** | 0.171*** | 0.221*** | 0.123* | 0.126* | 0.163* |
| | (0.060) | (0.063) | (0.073) | (0.070) | (0.073) | (0.085) |
| Observations | 1012 | 960 | 765 | 848 | 796 | 665 |
| Adj. R2 | 0.279 | 0.282 | 0.348 | 0.355 | 0.363 | 0.388 |
| Number of countries | 63 | 61 | 37 | 54 | 52 | 35 |
| Country-Year-Semester FE | Yes | Yes | Yes | Yes | Yes | Yes |
| **Dependent variable**: $\Delta r_{t+4}$ | | | | | | |
| $E_t(g_{t+4})$ | 0.311*** | 0.344*** | 0.480*** | 0.259*** | 0.286*** | 0.297*** |
| | (0.074) | (0.077) | (0.087) | (0.074) | (0.076) | (0.090) |
| Observations | 914 | 866 | 700 | 770 | 722 | 611 |
| Adj. R2 | 0.356 | 0.362 | 0.442 | 0.440 | 0.453 | 0.471 |
| Number of countries | 63 | 61 | 37 | 53 | 51 | 36 |
| Country-Year-Semester FE | Yes | Yes | Yes | Yes | Yes | Yes |
| **Dependent variable**: $\Delta r_{t+6}$ | | | | | | |
| $E_t(g_{t+4})$ | 0.213*** | 0.270*** | 0.333*** | 0.244*** | 0.309*** | 0.329*** |
| | (0.079) | (0.080) | (0.097) | (0.087) | (0.089) | (0.096) |
| Observations | 827 | 783 | 639 | 679 | 635 | 549 |
| Adj. R2 | 0.382 | 0.390 | 0.429 | 0.473 | 0.494 | 0.487 |
| Number of countries | 61 | 59 | 37 | 50 | 48 | 34 |
| Country-Year-Semester FE | Yes | Yes | Yes | Yes | Yes | Yes |

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.010$

Source: Author's estimates.

Note: Heteroskedasticity-robust standard errors in parentheses. $\Delta r_t$ in the first row indicates the instantaneous impact at time $t$. $\Delta r_{t+2}$ in the second row, $\Delta r_{t+4}$ in the third row, and $\Delta r_{t+6}$ in the fourth row indicate the impact after one, two, and three years, respectively.

## Annex F Estimates from a Linear-interaction Model

TABLE A3: Linear-interactive effect: fiscal policy and debt composition
Impact on the change in 10-year bond yields over 2 years (from t-1 to t+4), All EMDE sample

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | Change in 10 Yr bond yields: $\Delta r_{t+4}$ | | | |
| $E_t(g_{t+4})$ | 0.102 | 0.135 | 0.118 | 0.303*** |
| | (0.085) | (0.094) | (0.140) | (0.107) |
| Sov-bank nexus (t-1) | -5.482 | | | |
| | (8.475) | | | |
| $E_t(g_{t+4})$ × Sov-bank nexus (t-1) | 1.091 | | | |
| | (0.738) | | | |
| Foreign Non-bank holding/GDP (t-1) | | -17.152 | | |
| | | (70.830) | | |
| $E_t(g_{t+4})$ × Foreign Non-bank holding/GDP (t-1) | | 1.947* | | |
| | | (1.147) | | |
| Domestic Bank holding/GDP (t-1) | | | -9.612 | |
| | | | (11.047) | |
| $E_t(g_{t+4})$ × Domestic Bank holding/GDP (t-1) | | | 1.440* | |
| | | | (0.835) | |
| Domestic Non-bank holding/GDP (t-1) | | | | -128.334* |
| | | | | (74.854) |
| $E_t(g_{t+4})$ × Domestic Non-bank holding/GDP (t-1) | | | | 0.009 |
| | | | | (0.683) |
| Observations | 679 | 662 | 685 | 676 |
| Adj. R2 | 0.464 | 0.481 | 0.445 | 0.438 |
| Number of countries | 48 | 45 | 46 | 45 |
| Country FE | Yes | Yes | Yes | Yes |

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.010$

Source: Staff estimates.

Note: Heteroskedasticity-robust standard errors in parentheses. Explanatory variables related to sovereign debt structure (i.e., sovereign-bank nexus for column 1; foreign non-bank, domestic bank, and domestic non-bank holdings for columns 2-4) are all centered around pre-Covid global average. "t-1" indicates one-year lag of these variables.

# Annex G Effect of Fiscal Policies on External Bond Spreads: by Sovereign-Bank Nexus and Debt's Holder Composition

FIGURE A2: Marginal Effect of 4-year Ahead Primary Deficits on External Sovereign Bond Spreads Heterogeneity by Sovereign-Bank Nexus (All EMDEs, excluding China/India)

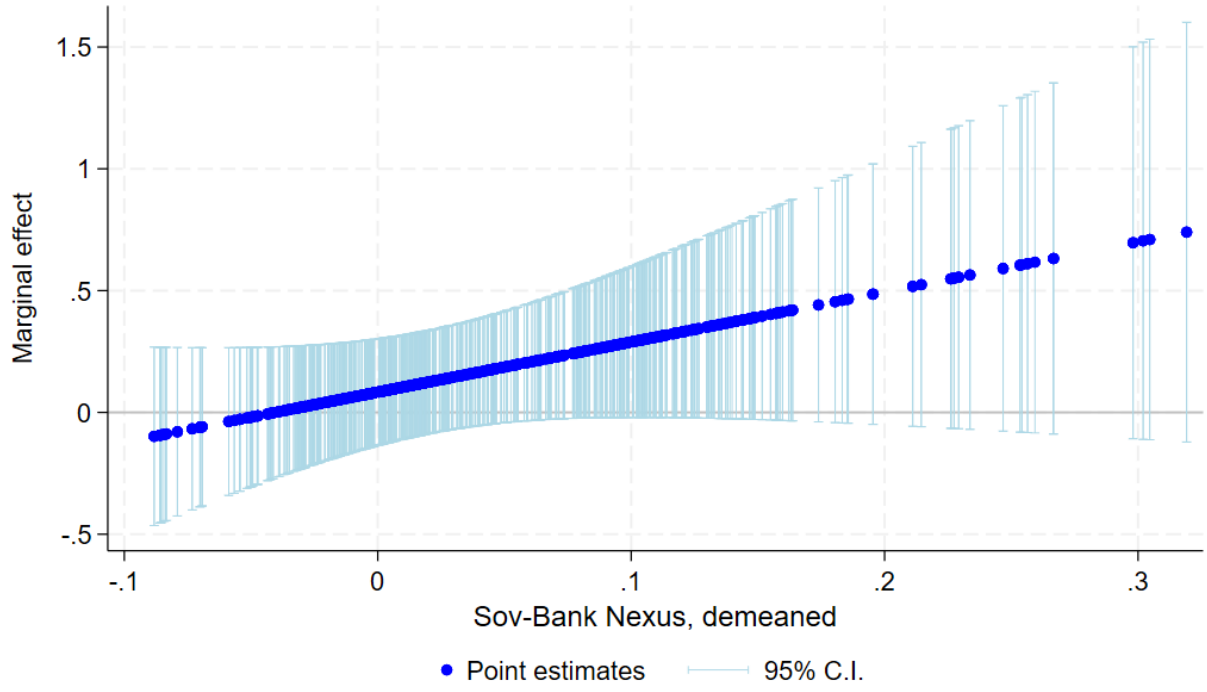
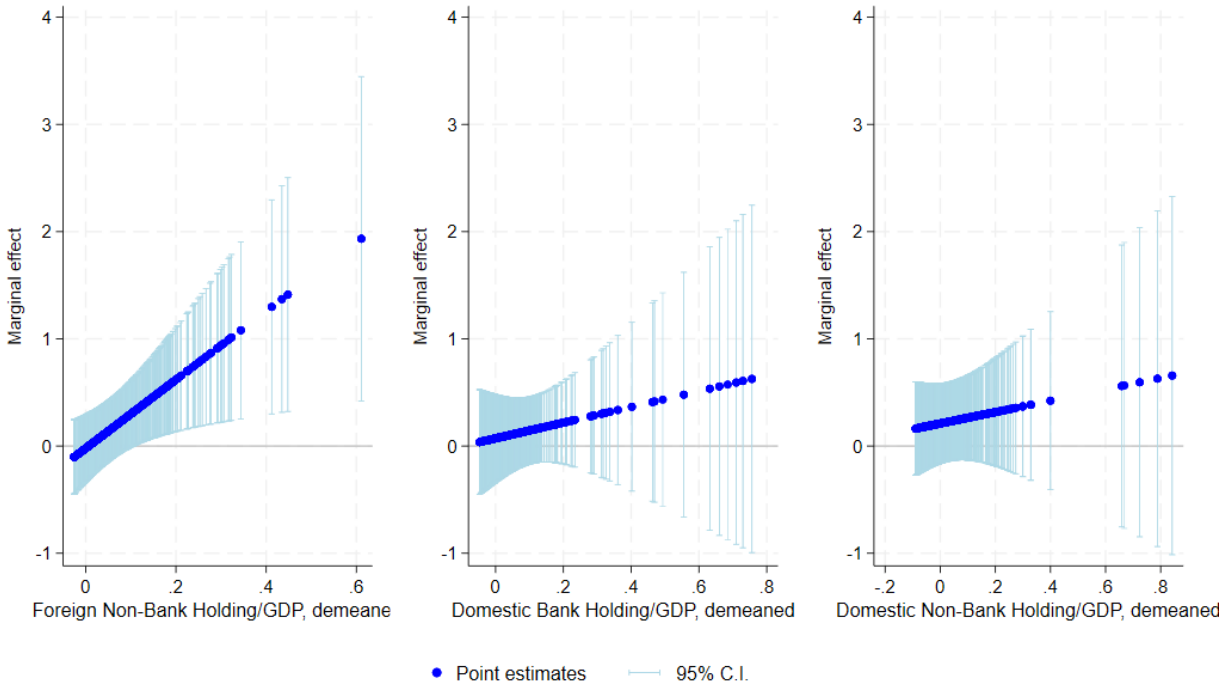


FIGURE A3: Marginal Effect of 4-year Ahead Primary Deficits on External Sovereign Bond Spreads Heterogeneity by Debt Holders (All EMDEs, excluding China/India)




Source: Bloomberg, IMF, Haver, Arslanalp and Tsuda (2014), and author's estimates.
Note: Estimates indicate cumulative impact over two years. 95 percent confidence intervals using heteroskedasticity robust standard errors are shown in error bars.