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Debt shocks and the dynamics of output and inflation in emerging economies

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DEBT SHOCKS AND THE DYNAMICS OF OUTPUT AND INFLATION IN EMERGING ECONOMIES

John Beirne and Nuobu Renzhi

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ABSTRACT

This paper empirically examines the impact of public debt shocks on output and inflation in 34 emerging market economies (EMEs) using panel local projections over the period 2000 to 2022. The estimated results show that real gross domestic product (GDP) falls significantly after an unanticipated increase in public debt while inflation rises. We also examine whether fundamental characteristics across EMEs could affect the impact of public debt shocks. The results suggest that higher initial debt levels, tighter domestic financial conditions, and lower income levels amplify the negative responses of real GDP, while tighter global financial conditions dampen the negative impacts of debt shocks. For inflation, the responses vary depending on economic-specific characteristics. We also find other nonlinearities in the dynamics, with EMEs facing more severe effects during recessionary periods.

Keywords: public debt, GDP, inflation, emerging market economies

JEL codes: E62, F40

1. Introduction

The link between debt and the outlook for economic growth and inflation is a key policy consideration. Debt sustainability risks in emerging market economies (EMEs) were amplified in the aftermath of the coronavirus disease (COVID-19) pandemic. Fiscal support packages implemented due to the pandemic led to higher stocks of public debt, while tighter global monetary conditions increased the cost of financing public debt, widening deficits. Managing the inflationary effects of fiscal expansions has created significant challenges for policy makers, also affecting the trajectory of output growth. This paper considers the ramifications of debt shocks in EMEs on the trajectory of output and inflation over short and longer horizons.

This paper contributes to the literature on the macroeconomic effects of debt. There is significant literature on the role of debt in affecting output. Reinhart and Rogoff (2010) note that for levels of debt to gross domestic product (GDP) above 90%, a negative impact on growth materializes. As regards the role of debt on inflation, this can be traced back to the fiscal dominance work of Sargent and Wallace (1981), whereby persistent fiscal deficits and excessive debt constrain the central bank from tightening monetary policy, leading to amplified inflation expectations. Cevik and Miryugin (2023) find that the extent of fiscal policy shocks on inflation is closely driven by the initial level of fiscal space. Building on the literature, this paper simultaneously examines the impact of exogenous debt shocks on output and inflation. This paper aims to fill this gap in the literature by employing panel local projections as in Jordà (2005) to estimate the impact of public debt on output and inflation in 34 EMEs over the period 2000–2022.

The paper focuses on the effect of unexpected debt accumulations on economic growth and inflation in emerging economies. Research on the implications of debt on output are more prevalent in the literature compared to those on inflation, with some studies noting nonlinearity in the relationship, whereby debt over a certain threshold can reduce growth (Baum, Checherita-Westphal, and Rother 2013; Cecchetti, Mohanty, and Zampolli 2011; Reinhart and Rogoff 2010). However, there is a lack of consensus, with other work finding a negative relationship and no thresholds (Eberhardt and Presbitero 2015, Panizza and Presbitero 2014, Woo and Kumar 2015). More recent work has found that the trajectory of debt matter for the impact on growth (de Soyres, Kawai, and Wang 2022, Chudik et al. 2017). Other work has focused on private and corporate debt, systemic risk, and recessions (Jordà et al. 2013, Bernardini and Forni 2017). As regards the inflationary repercussions of debt shocks, this can be traced back to Sargent and Wallace (1981), who found that persistent fiscal deficits and excessive debt constrain the central bank from tightening monetary policy, leading to amplified inflation expectations. Studies pertaining to monetary policy coordination with fiscal policy have also shed light on the role of fiscal shocks on inflation, with some previous work finding that fiscal tightening in inflation-targeting central bank economies helps to reduce inflation (Catão and Terrones 2005; de Mendonça and Machado 2013; Coibion, Gorodnichenko, and Weber 2021; Brandao-Marques et al. 2023). Cevik and Miryugin (2023) also find the extent of fiscal policy shocks on inflation is closely driven by the initial level of fiscal space. For EMEs in particular, the risk of encountering a debt-inflation trap was found for highly-indebted economies (Kwon, McFarlane, and Robinson 2009).

In this paper, examining the effect of debt shocks on output and inflation across EMEs, we overcome potential endogeneity concerns by computing a series of identified public debt shocks for each of the 34 EMEs. Following the approach by de Soyres, Kawai, and Wang (2022), we use the forecast errors from the World Economic Outlook (WEO) vintages to identify the exogenous shocks in public debt, which isolate the impact from the debt variable only. The estimated public debt shocks therefore mitigate the endogeneity issue between public debt and other macroeconomic variables, including real GDP and inflation rate. We then estimate the responses of real GDP and inflation rate to the identified public debt shocks and find that real GDP significantly decreases after an unanticipated increase in public debt while the inflation rate responds in the opposite direction. These results are robust to a set of sensitivity checks, including adding lags of initial debt level as controls and dropping lags of dependent variables.

We also study whether fundamental characteristics across EMEs could affect the impact of public debt shocks. The results suggest that a higher initial debt, a tighter domestic financial condition, and a lower income level could strengthen the negative responses of real GDP while tighter global financial conditions dampen the negative impacts of debt shocks. For the inflation rate, the responses vary depending on economic-specific characteristics. We also find significant state dependency, with EMEs facing more severe effects during recessionary periods. The remainder of this paper is structured as follows. Section 2 describes the data and outlines the empirical methodology. Section 3 presents the empirical results with robustness checks. Section 4 presents the results of the extended analysis. Section 5 concludes.

2. Data and Empirical Methodology

In this section, we first describe the data source of variables we use in the empirical analysis. We then discuss the identification of the public debt shocks. Finally, we present our econometric framework used to produce the empirical results.

2.1 Data

We use available yearly data with an unbalanced panel for 34 EMEs spanning from 2000 to 2022.¹ We collect data on the real GDP as the domestic output measure, the year-on-year change of the consumer price index as a measure of the inflation rate, and the actual and projected public debt relative to its GDP. The data are all from the WEO of the International Monetary Fund (IMF).

As the impact of public debt on the macroeconomy can be affected by domestic and global financial conditions, we also include the following two variables in our empirical analysis. First, to measure the domestic financial conditions, we construct a financial condition index by averaging the central bank policy rate and 10-year government bond yield, obtained from the IMF's International Financial Statistics. Second, we use the VIX index which stands for the Chicago Board Options Exchange (CBOE) Volatility Index, as a measure of global financial conditions.

¹ The sample of EMEs includes Brazil; Bulgaria; Chile; the People's Republic of China; Colombia; Czech Republic; Egypt; Greece; Hong Kong, China; Hungary; Indonesia; Israel; the Republic of Korea; Kuwait; Mauritius; Mexico; Malaysia; Morocco; Nigeria; Pakistan; Peru; the Philippines; Poland; Qatar; Romania; the Russian Federation; Saudi Arabia; Singapore; South Africa; Taipei, China; Thailand; Ukraine; Viet Nam; and the United Arab Emirates. The data starting year for a specific variable varies across economies due to the data availability and reliability.

2.2 Identification of Public Debt Shocks

The goal of this paper is to estimate the causal effect of public debt on output and inflation in emerging economies. As such, we face the usual endogeneity issue between public debt and other macroeconomic variables, including real GDP and inflation. To identify exogenous shocks in public debt, following de Soyres, Kawai, and Wang (2022), we use the forecast errors from various vintages of the IMF WEO publications. We compute the debt shocks in debt-to-GDP terms, with the shock applied only to public debt and not to GDP, to isolate the impact from the debt variable only. Specifically, public debt shocks can be defined as follows:

$$debt_{i,t}^{shock} = \Delta \ln debt_{i,t}^{actual} - \Delta \ln debt_{i,t}^{forecast} \quad (1)$$

where $\Delta \ln debt_{i,t}^{actual}$ refers to the log growth rate of the actual debt-to-GDP ratio and $\Delta \ln debt_{i,t}^{forecast}$ is the log growth rate of the forecasted debt-to-actual GDP ratio projected by IMF analysts in October of the same year. The change between the actual and projected public debt levels is thus identified as an exogenous shock to public debt as the forecast errors absent any unanticipated policy changes (e.g., Blanchard and Perotti 2002; Auerbach and Gorodnichenko 2012, 2013; Abiad, Furceri, and Topalova 2016; and Furceri et al. 2018).

2.3 Econometric Methodology

Following the framework proposed by Jordà (2005), we use the panel local projection (LP) to estimate the model and calculate impulse responses to exogenous public debt shocks. The baseline model can be given as follows:

$$y_{i,t+h} - y_{i,t-1} = \alpha_i^h + \lambda_t^h + \sum_{l=0}^L \delta_l^h z_{i,t-l} + \beta^h debt_{i,t}^{shock} + \varepsilon_{i,t+h} \quad (2)$$

where $i = 1, \dots, N$ refers to the specific economy in the sample, y is the variable of interest (e.g., real GDP or inflation rate), $debt_{i,t}^{shock}$ is the series of identified public debt shocks, z is a vector of control variables including lagged values for y and $debt_{i,t}^{shock}$ as well as other control variables, and δ_l^h is a vector of coefficients associated with the lags of z . Specifically, we set $L = 2$, therefore we include 2 years of lagged values of z . The coefficient β^h measures the impact of a 1% public debt shocks, namely a 1 percent unanticipated increase in the public debt to GDP ratio, on y at horizon h . Thus, one constructs the impulse responses as a sequence of the β^h estimated in a series of separate regressions for each horizon h . α_i denotes economy-specific fixed effects, controlling for the time-invariant characteristics of the economy. λ_t^h represents the time fixed effects². Finally, $\varepsilon_{i,t+h}$ denotes a mean zero error term capturing other shocks. We cluster our standard errors at the economy level.

We can further adapt the LP framework to allow for nonlinearities in the specifications that are associated with domestic and global financial conditions. We therefore make the

² The time fixed effects also control for structural breaks due to the COVID-19 pandemic.

response of output or inflation to a public debt shock also dependent on the contemporaneous change in domestic and global financial conditions by interacting the public debt shock with the change in financial condition variables. The specification is as follows:

$$y_{i,t+h} - y_{i,t-1} = \alpha_i^h + \lambda_t^h + \sum_{l=0}^L \delta_l^h z_{i,t-l} + \beta^h debt_{i,t}^{shock} + \theta^h FC_{i,t} \times debt_{i,t}^{shock} + \varepsilon_{i,t+h} \quad (3)$$

where $FC_{i,t}$ is a variable representing our financial condition variables, including the domestic financial condition index, and global financial conditions (measured as the VIX index). Therefore, β^h measures the response of output or inflation to the public debt shock at each horizon (year) h when the financial conditions are isolated, and $\beta^h + \sigma \theta^h$ represents the total effects of public debt shocks when we consider the impact of financial conditions. σ measures one percentage change in the specific financial condition variable.

We also divide EMEs into groups according to their levels of initial public debts, income classifications, and regional categorizations and estimate separate impulse responses for each group. Regarding the estimation of local projections, we incorporate a dummy variable I that takes a value of 1 for EMEs whereby they fall within a certain group $m \in M$. Following Cloyne et al. (2023), we extend the local projection as follows:

$$y_{i,t+h} - y_{i,t-1} = \alpha_i^h + \lambda_t^h + \sum_{m \in M} I \left[\sum_{l=0}^L \delta_{m,l}^h z_{i,t-l} + \beta_m^h debt_{i,t}^{shock} + \theta_m^h FC_{i,t} \times debt_{i,t}^{shock} \right] + \varepsilon_{i,t+h} \quad (4)$$

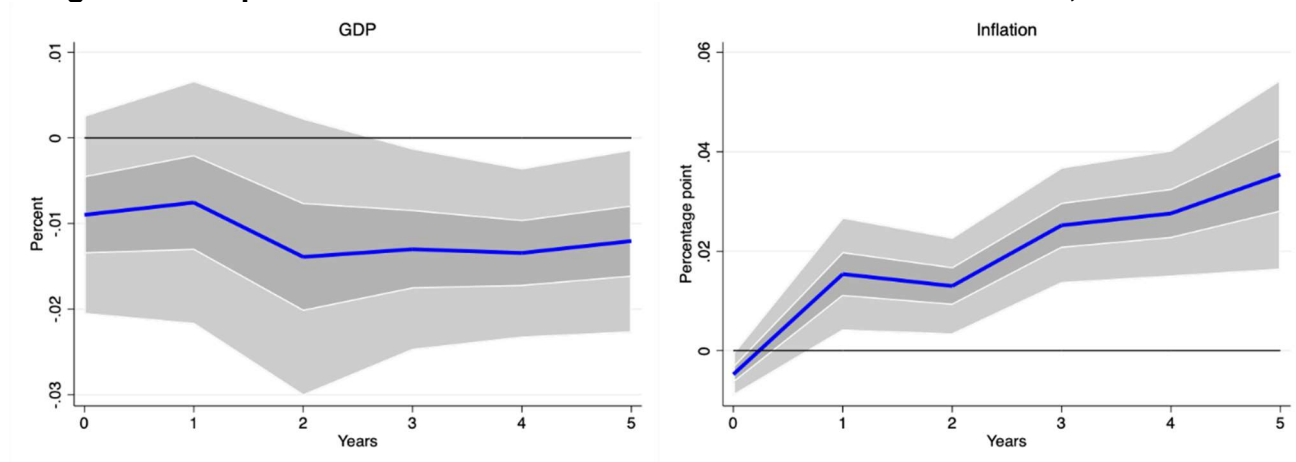
where the notation is as in equation 3.

3. Empirical Results

3.1 Baseline Results

Figure 1 shows the estimated impulse responses of real GDP and inflation rate to public debt shocks, based on the linear model of equation 2. The solid line in each graph represents the estimated impulse responses in percentage over the following 5 years to a 1% positive public debt shock, namely a 1% unanticipated increase in the public debt to GDP ratio. The shaded area represents 68% (dark) and 90% (light) confidence bands.

Figure 1: Response of Real GDP and Inflation to Public Debt shocks, Baseline



GDP = gross domestic product.

Notes: The figure plots the impulse responses of real GDP and inflation rate to a 1% positive public debt shock. Shaded areas represent 68% and 90% confidence bands.

Source: Authors' estimates.

The impulse responses indicate that real GDP decreases after an unanticipated increase in public debt while the inflation rate responds positively to debt shocks.³ Following a positive public debt shock, the level of real GDP decreases with a maximum impact of -0.015% percent around 2 years after the shock. The estimated result is in line with the literature that also shows a negative impact of public debt shocks on real GDP

³ Our results also show that a 1% debt shock also triggers a significant positive response in debt itself by around 0.03% to 0.07% within the first year.

(e.g., Reinhart and Rogoff 2010; Woo and Kumar 2015; de Soyres, Kawai, and Wang 2022). On the contrary, public debt shocks have a positive impact on the inflation rate.⁴ An unexpected increase in public debt is associated with a persistent increase in the inflation rate, which is broadly consistent with Catão and Terrones (2005) who find a strong positive association between deficits and inflation among high-inflation and developing economies.

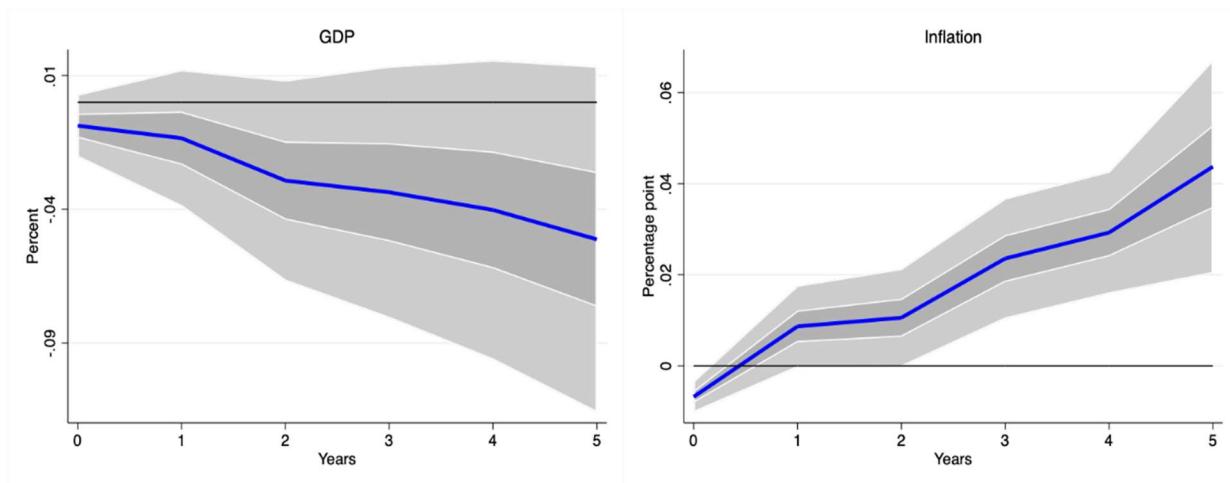
3.2 Robustness

3.2.1 Adding Lags of Initial Debt Level as Controls

To check the robustness of our baseline results, we add two lags of the initial debt-to-GDP ratio as additional controls. Figure 2 reports the estimated impulse responses of real GDP and inflation rate to a 1% positive public debt shock, adding lags of initial debt level as additional controls. The results show that real GDP decreases persistently and significantly after the shock while the inflation rate responds positively, broadly consistent with our baseline estimates.

⁴ While there is a strong underlying economic rationale for including time dummies in the baseline (i.e., to control for any trend behavior in the forecast errors), the results excluding the time dummies are not materially different. Global debt shocks indeed will be reflected with variation across domestic debt dynamics. The baseline approach in identifying the debt shocks using forecast errors remains consistent at the economy level therefore, even in the presence of global debt shocks. The inclusion of time dummies further controls for any residual trend behavior that could be driven by global factors. Nonetheless, the results that exclude the time dummies do not significantly change the baseline results. Heterogeneities in time dummy estimates across alternative categories of economies, such as high versus low income, also do not significantly change the baseline results.

Figure 2: Response of Real GDP and Inflation to Public Debt Shocks, Adding Lags of Initial Debt Levels



GDP = gross domestic product.

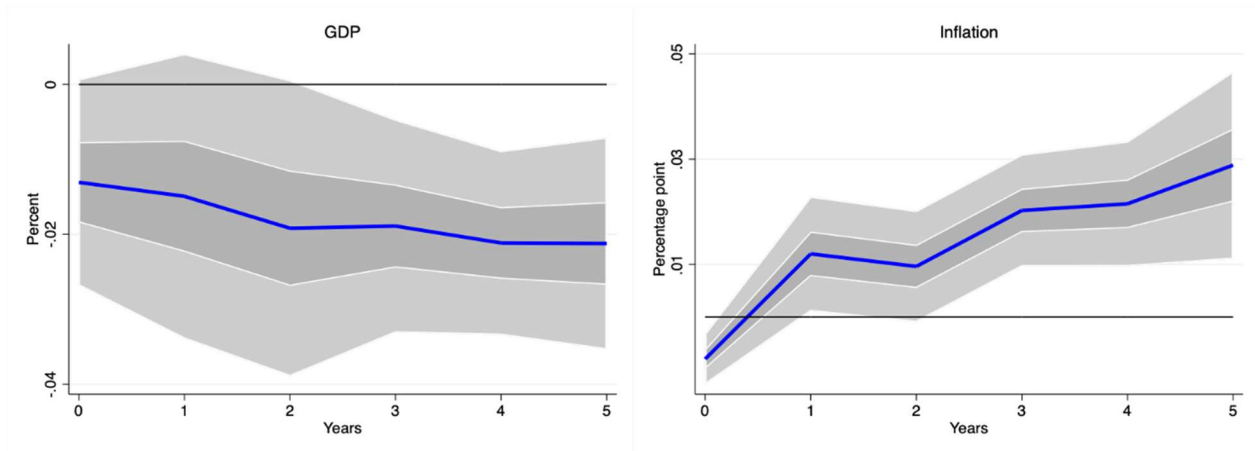
Notes: The figure plots the impulse responses of real GDP and inflation rate to a 1% positive public debt shock. Shaded areas represent 68% and 90% confidence bands.

Source: Authors' estimates.

3.2.2 Dropping Lags of Dependent Variables

Thus far, we have followed the literature on standard local projections, adding lagged dependent variables as controls. On the other hand, one may be concerned that endogeneity issues may arise if there is a correlation between the lags of the dependent variables and the excluded lags subsumed in the error term (e.g., Nickell-bias). For this reason, we now drop the lagged dependent variables to further substantiate our baseline estimates. Figure 3 reports the estimated impulse responses of real GDP and inflation rate to a 1% positive public debt shock, dropping lagged dependent variables. The results show that real GDP decreases significantly after the shock while the inflation rate responds positively, further indicating the robustness of our baseline estimates.

Figure 3: Response of Real GDP and Inflation to Public Debt Shocks, Dropping Lagged Dependent Variables



GDP = gross domestic product.

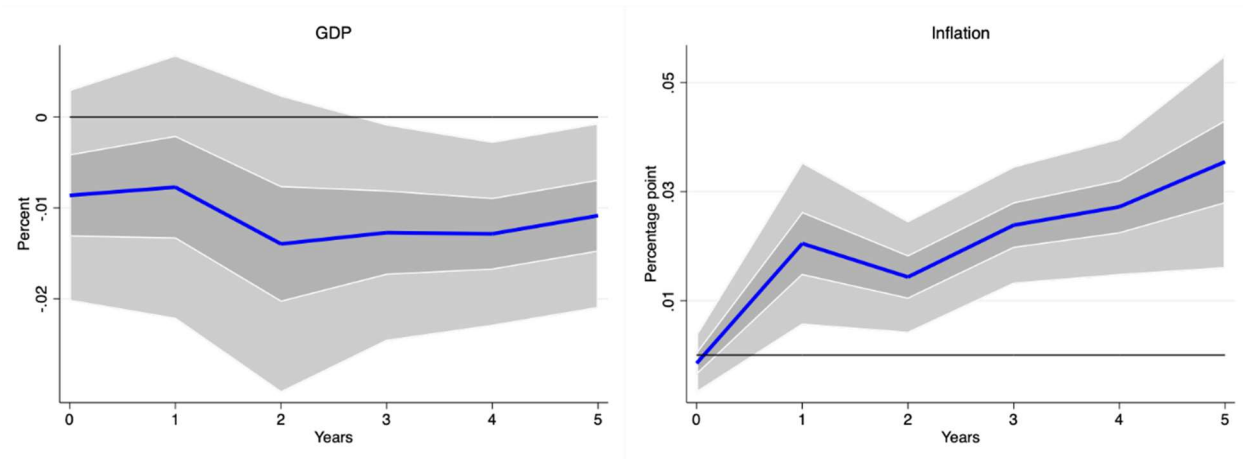
Notes: The figure plots the impulse responses of real GDP and inflation rate to a 1% positive public debt shock. Shaded areas represent 68% and 90% confidence bands.

Source: Authors' estimates.

3.2.3 Alternative Public Debt Shock Measurements

To further strengthen the case that the forecast errors can be regarded as exogenous debt shocks (even potentially capturing inflation or growth surprises), we follow the methodology in the October 2017 IMF WEO and Magud and Pienknagura (2022) by orthogonalizing the debt shocks. We regress the debt forecast errors on forecast errors of real GDP growth and inflation, including a set of economy-fixed effects. The residuals from these regressions are then used as our alternative debt shocks. Using the alternative debt shock measurement, the results (Figure 4) indicate that our benchmark estimates are quantitatively and qualitatively robust to alternative debt shocks.

Figure 4: Response of Real GDP and Inflation to Public Debt Shocks, Alternative Public Debt Shock Measurements



GDP = gross domestic product.

Notes: The figure plots the impulse responses of real GDP and inflation rate to a 1% positive public debt shock. Shaded areas represent 68% and 90% confidence bands.

Source: Authors' estimates.

4. Extensions

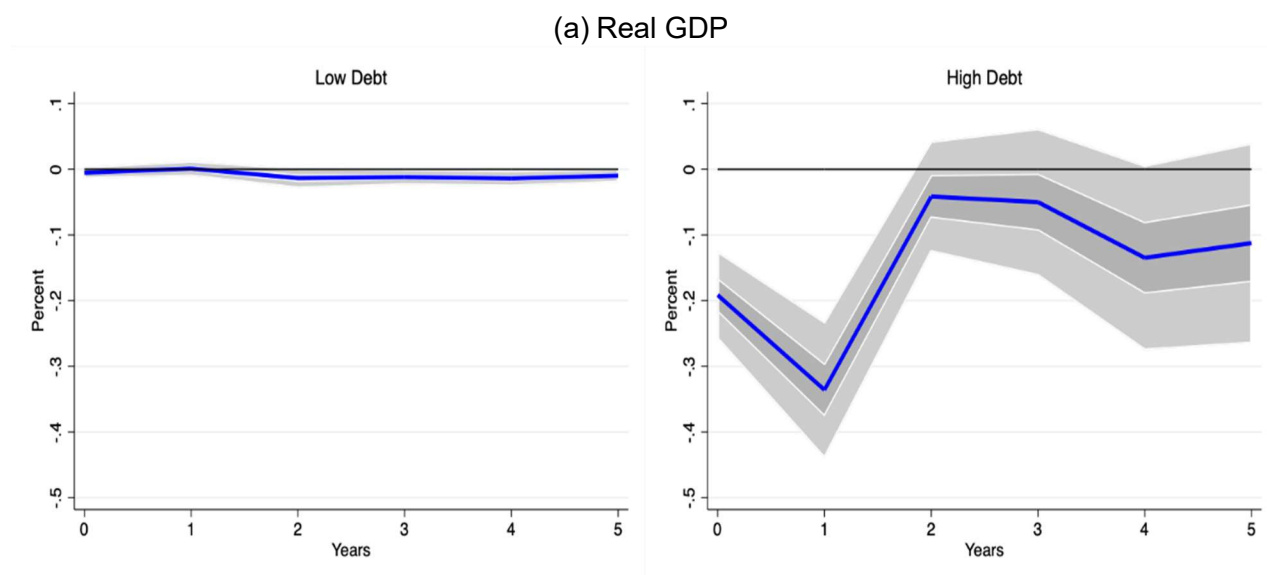
4.1 Impulse Responses Conditioning on Initial Debt Levels

So far, we have examined the impact of public debt shocks on output and inflation irrespective of initial debt levels. To explore the extent to which the ex-ante level of public debt matters in shaping the response dynamics to the debt shock, we focus on the difference in the impact of the debt shock on EMEs with different initial public debt levels. Specifically, we separate our sample EMEs into two groups: high and low initial level of public debt, using as a threshold the median of our sample (41.07%). Figure 5 illustrates the response of real GDP and inflation for EMEs with low and high initial levels of public debt. The figure shows that for economies in the high debt group, the negative impact of the unanticipated public debt increase on real GDP is much stronger than the baseline case, leading to a significant -0.33% decrease in real GDP around 1 year after the shock.

By contrast, high-debt economies experience a significant decrease in inflation rate in response to a public debt rise, indicating that debt sustainability concerns may further weaken the aggregate demand for EMEs with high debt levels. For the low-debt economies, we find that the responses of real GDP and inflation are similar with the baseline case while the impact of public debt increase is slightly weaker in the short term.⁵

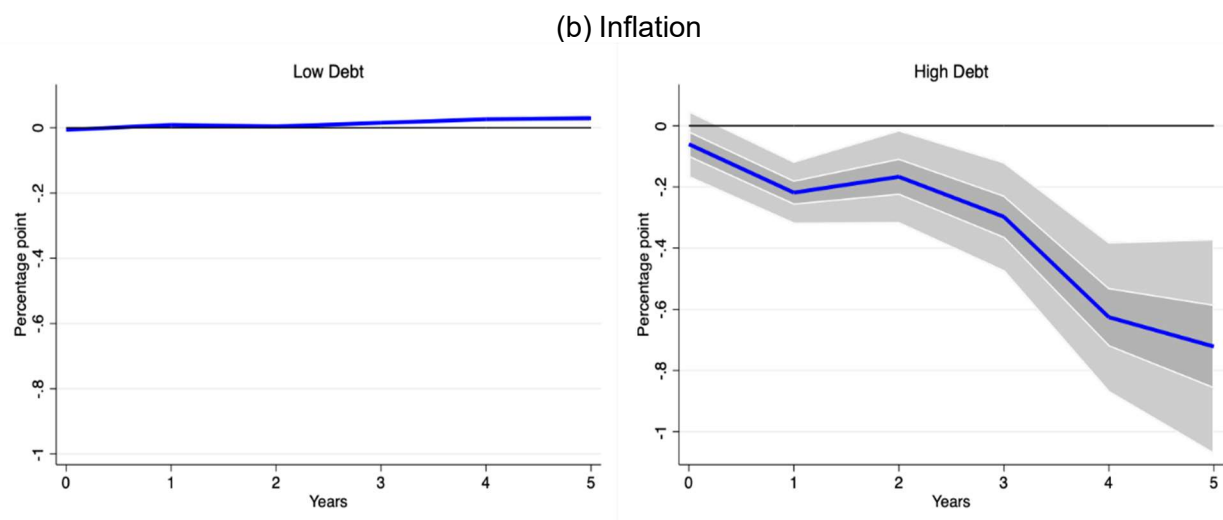
In the case of high-debt economies, debt shocks in economies where debt is already elevated can trigger negative aggregate demand effects (Mian, Straub, and Sufi 2022). The channel works through a weakening in the credibility of fiscal policy, and lower consumption due to resulting negative wealth effects. In particular, a lack of credibility by agents in fiscal policy can lead to anticipated rises in taxation later on, triggering negative demand effects, and lower inflation (Montes and de Hollanda Lima 2022).

Figure 5: Response of Real GDP and Inflation to Public Debt Shocks, by Initial Debt Levels



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⁵ Note that for comparative purposes and for clarity on the differences in impact by magnitude, a consistent scale is used for low versus high debt groups.



GDP = gross domestic product.

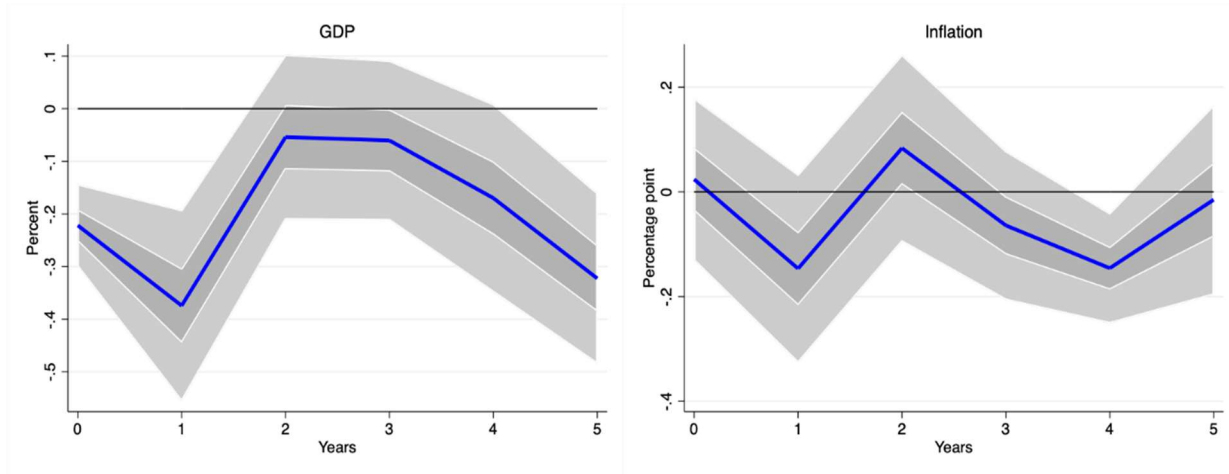
Notes: The figure plots the impulse responses of real GDP and inflation rate to a 1% positive public debt shock. Shaded areas represent 68% and 90% confidence bands.

Source: Authors' estimates.

4.2 Impulse Responses Conditioning on Domestic Financial Conditions

We test if an economy's domestic financial conditions affect the impact of public debt shocks on output and inflation. Specifically, we interact the public debt shock with our constructed financial condition index as in equation 3. Figure 6 shows the impulse responses of real GDP and inflation rate to positive public debt shocks depending on domestic financial conditions. Our results show that tighter domestic financial conditions further strengthen the impact of an unanticipated increase in public debt on the output. The level of real GDP decreases by about -0.38% 1 year after the shock and drops persistently after 3 years. Regarding the inflation rate, the overall responses to a positive public debt shock are more muted and show opposite signs compared to the baseline.

Figure 6: Response of Real GDP and Inflation to Public Debt Shocks, Conditioning on Domestic Financial Conditions



GDP = gross domestic product.

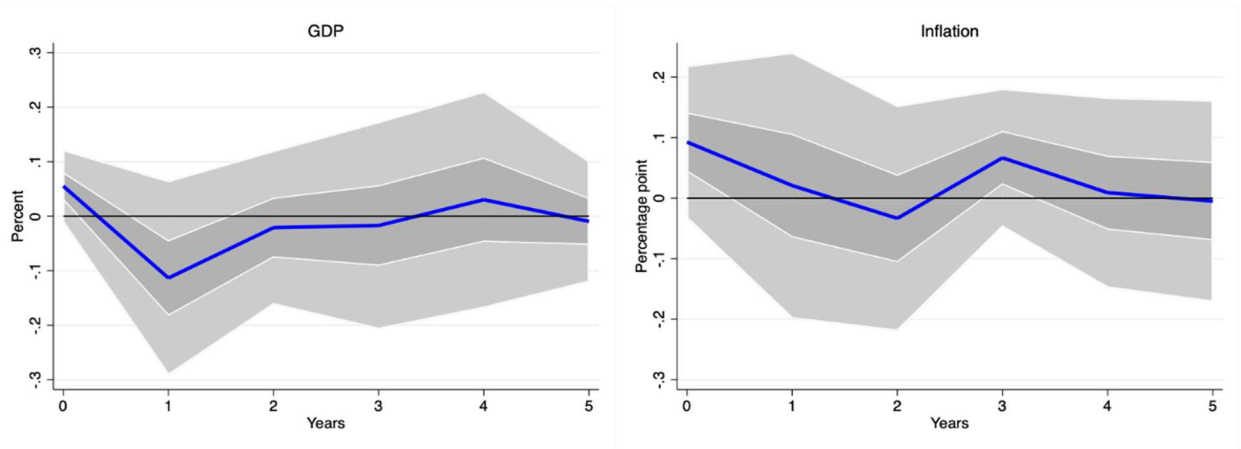
Notes: The figure plots the impulse responses of real GDP and inflation rate to a 1% positive public debt shock. Shaded areas represent 68% and 90% confidence bands.

Source: Authors' estimates.

4.3 Impulse Responses Conditioning on Global Financial Conditions

We further examine whether global financial conditions may impact the effect of debt increase by interacting the public debt shock with the VIX index, based on equation 3. Figure 7 shows the impulse responses of real GDP and inflation rate to positive public debt shocks conditioning on global financial conditions. Our results show that the impact of public debt shocks on output and inflation is somewhat weaker with tighter global financial conditions. Although the level of real GDP decreases by about -0.11% 1 year after the shock, the negative responses disappear and become statistically insignificant after 2 years. Similarly, while the inflation rate increases by about 0.1 percentage points right after the positive public debt shock, the overall responses are more muted compared to the baseline.

Figure 7: Response of Real GDP and Inflation to Public Debt Shocks, Conditioning on Global Financial Conditions



GDP = gross domestic product.

Notes: The figure plots the impulse responses of real GDP and inflation rate to a 1% positive public debt shock. Shaded areas represent 68% and 90% confidence bands.

Source: Authors' estimates.

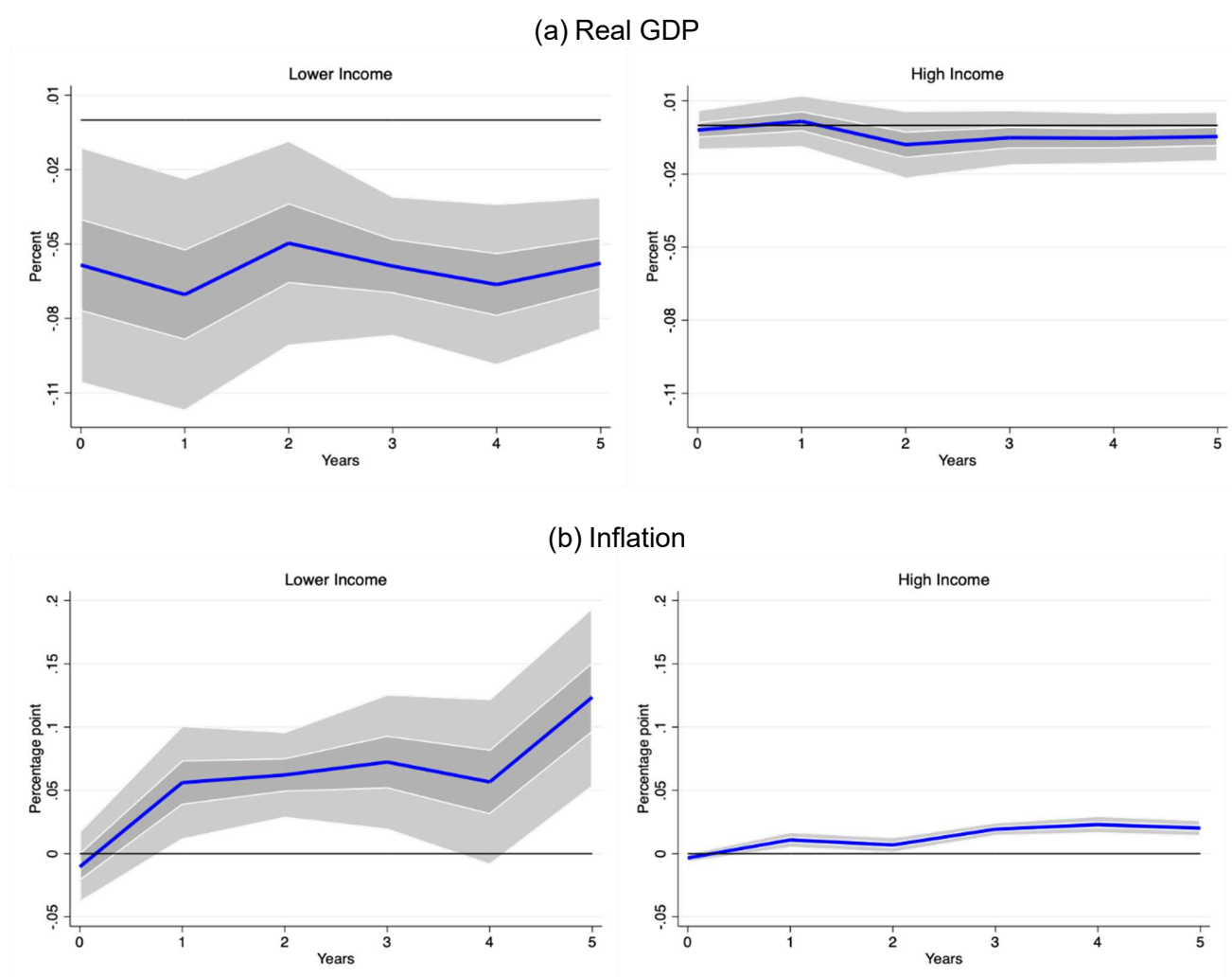
4.4 Impulse Responses Conditioning on Income Levels

To analyze how the income level affects the impact of an unanticipated increase in public debt, we divide our EME sample between high- and lower-income economies following the World Bank income classification.⁶ Figure 8 shows the impulse responses of real GDP and inflation rate to positive public debt shocks, comparing between lower-income EMEs and high-income EMEs on consistent scales. The result indicates that, in lower-income EMEs, a 1% unanticipated increase in the debt-to-GDP ratio leads to a significant -0.07% decrease in real GDP 1 year after the shock. Inflation rate increases by about 0.05 percentage points after 1 year for lower-income EMEs, rising to 0.13 percentage points after 5 years. These results are much larger compared to the baseline

⁶ We define lower-income economies as the combination of lower-mid-income and upper-mid-income economies in our EME sample, including Brazil, Bulgaria, the People's Republic of China, Colombia, Egypt, Indonesia, Malaysia, Mauritius, Mexico, Morocco, Nigeria, Pakistan, Peru, the Philippines, the Russian Federation, South Africa, Thailand, Ukraine, and Viet Nam.

estimates, meaning that lower-income EMEs could suffer significantly from public debt shocks. For high-income EMEs, the response is smaller in magnitude. A 1% unanticipated increase in debt-to-GDP ratio leads to a significant -0.008% reduction in real GDP 2 years after the shock. Inflation rate increases by about 0.01 percentage points 1 year after the shock, rising to 0.02 percentage points after 5 years.

Figure 8: Response of Real GDP and Inflation to Public Debt Shocks, by Income Classification



GDP = gross domestic product.

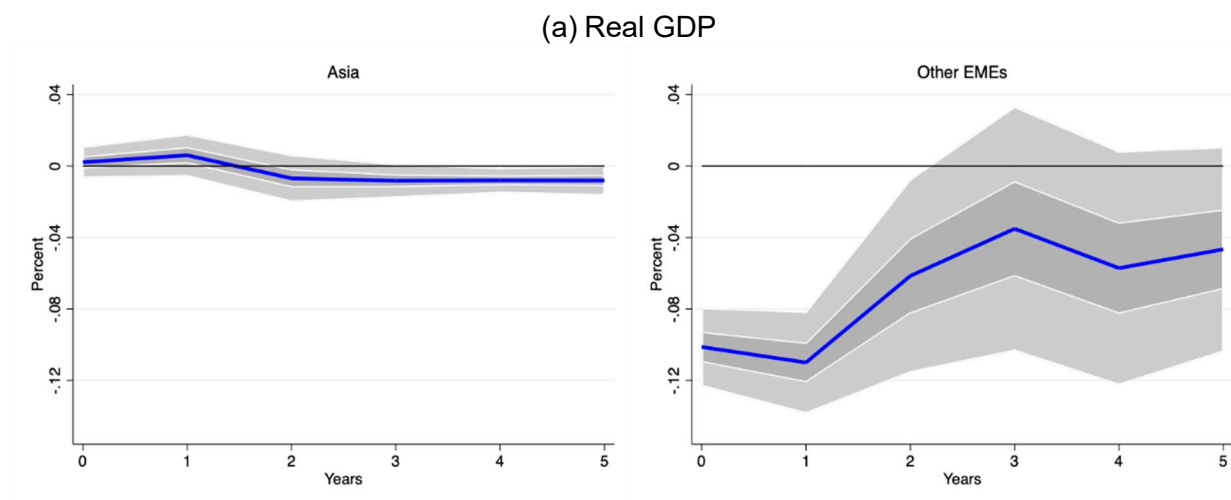
Notes: The figure plots the impulse responses of real GDP and inflation rate to a 1% positive public debt shock. Shaded areas represent 68% and 90% confidence bands.

Source: Authors' estimates.

4.5 Asia vs. other EMEs

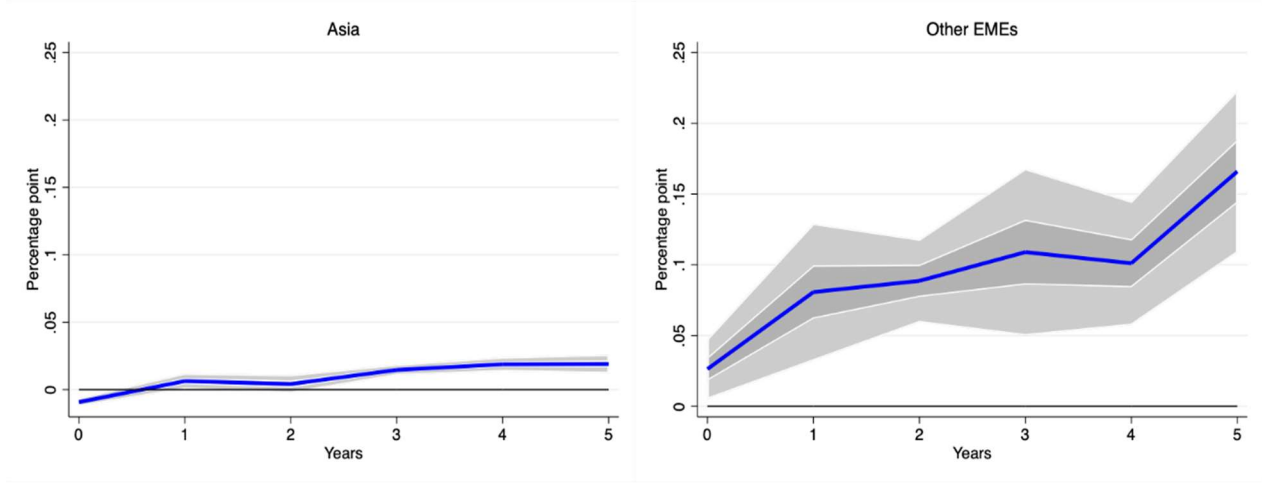
We further separate our EME sample into Asia and other non-Asian EMEs. Figure 9 shows the impulse responses of real GDP and inflation rate to positive public debt shocks, comparing Asia and other EMEs on consistent scales. The results show that, in non-Asian EMEs, a 1% unanticipated increase in the debt-to-GDP ratio leads to a significant -0.1% decrease in real GDP 1 year after the shock. Inflation rate increases by about 0.075 percentage points after 1 year for lower-income EMEs, rising to 0.17 percentage points after 5 years. These results are much larger compared to the baseline estimates, at least for the short term, indicating that non-Asian EMEs are more affected by the public debt shocks. For the Asian EME group, the overall response is smaller in magnitude. A 1% unanticipated increase in debt-to-GDP ratio leads to a significant -0.006% reduction in real GDP 2 years after the shock. Inflation rate increases by about 0.005 percentage points 1 year after the shock, rising to 0.02 percentage points after 5 years.

Figure 9: Response of Real GDP and Inflation to Public Debt Shocks, Asia vs. other EMEs



Continued on the next page

(b) Inflation



GDP = gross domestic product.

Notes: The figure plots the impulse responses of real GDP and inflation rate to a 1% positive public debt shock. Shaded areas represent 68% and 90% confidence bands.

Source: Authors' estimates.

4.6 State-Dependent Effects

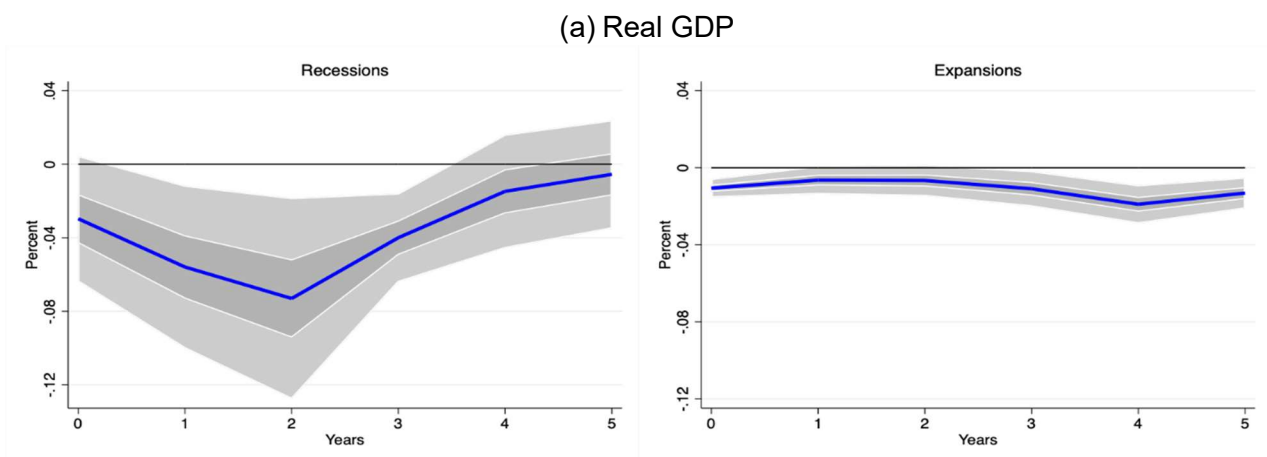
To further test the issue of nonlinearity and whether the transmission of public debt shocks depends on the business cycle, we follow the methodology of Ramey and Zubairy (2018) to estimate state-dependent local projections. We base our state variable on the real GDP, following the standard macroeconomic literature. To define states of recessions and expansions, we construct an output gap measure by considering the deviation of real GDP from a smooth trend. We construct this trend by running a HP filter (Hodrick and Prescott 1997) with a smoothing parameter equal to 400.

$$\begin{aligned}
 y_{i,t+h} - y_{i,t-1} = & I_{t-1} [\alpha_{a,i}^h + \sum_{l=0}^L \delta_{a,l}^h z_{i,t-l} + \beta_a^h debt_{i,t}^{shock}] \\
 & (1 - I_{t-1}) [\alpha_{b,i}^h + \sum_{l=0}^L \delta_{b,l}^h z_{i,t-l} + \beta_b^h debt_{i,t}^{shoc}] + \varepsilon_{i,t+h}
 \end{aligned} \tag{5}$$

where $I_{t-1} \in \{0, 1\}$ is a dummy variable that indicates the state of the business cycle in terms of real GDP before the public debt shock hits. In particular, I_{t-1} takes a value of 1 in the recessions and 0 otherwise.

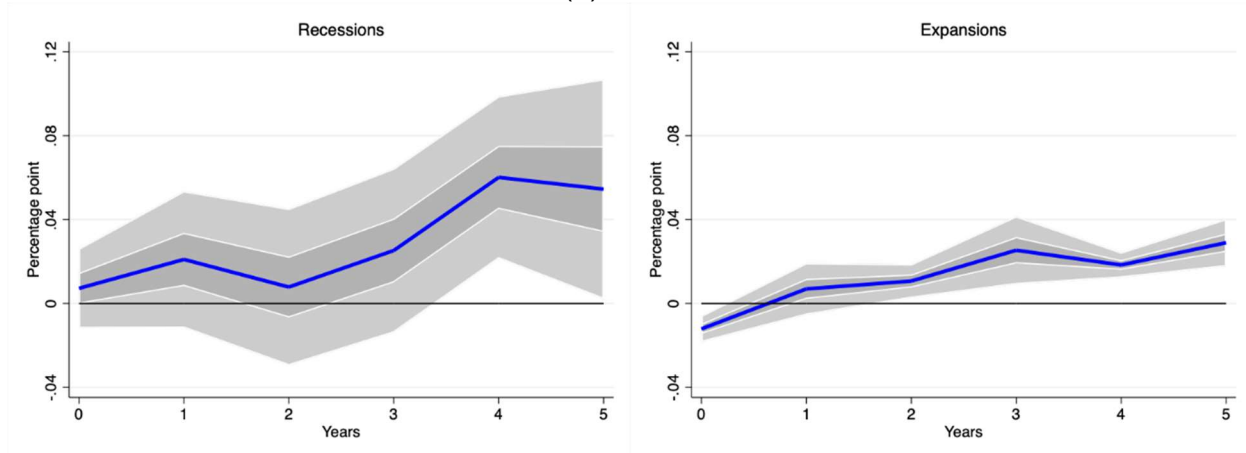
Figure 10 shows the impulse responses of real GDP and inflation to positive public debt shocks, comparing the periods of recessions and expansions and presented on consistent scales. The result indicates that, during recessions, a 1% unanticipated increase in the debt-to-GDP ratio leads to about a -0.07% decrease in real GDP 2 years after the shock. Inflation rate increases by about 0.02 percentage points after 1 year, rising to 0.06 percentage points after 5 years. These results are larger compared to the baseline estimates, meaning that EMEs could suffer significantly from public debt shocks during recessions. For the periods of expansions, the responses of real GDP and inflation rate are smaller in magnitude. Overall, in both states, real GDP falls significantly after an unanticipated increase in public debt while inflation rises, consistent with the benchmark findings.

Figure 10: Response of Real GDP and Inflation to Public Debt Shocks, Recessions vs. Expansions



Continued on the next page

(b) Inflation



GDP = gross domestic product.

Notes: The figure plots the impulse responses of real GDP and inflation rate to a 1% positive public debt shock. Shaded areas represent 68% and 90% confidence bands.

Source: Authors' estimates.

5. Conclusions

In this paper, we empirically examine the impacts of public debt shocks on output and inflation in EMEs using panel local projections. The estimated results show that real GDP falls significantly after an unanticipated increase in public debt while the inflation rate responds positively. We also study whether fundamental characteristics across EMEs could affect the impact of public debt shocks. The results suggest that a higher initial debt, a tighter domestic financial condition, and a lower income level could strengthen the negative responses of real GDP while tighter global financial conditions dampen the negative impacts of debt shocks. For the inflation rate, the responses vary depending on economic-specific characteristics. We also find other nonlinearities in the dynamics, with EMEs facing more severe effects during recessionary periods.

Our findings have implications for policy makers aiming to enhance public debt sustainability. In particular, given that lower initial levels of debt or a declining debt

trajectory can mitigate the negative repercussions of debt shocks on growth, longer-term fiscal consolidation strategies need to be prioritized. Building up fiscal buffers in good times can be an important contributory factor. Recognizing that the optimal design of medium-term fiscal frameworks is challenging, policy makers should bear in mind the output and inflation repercussions of unanticipated debt shocks, which are more severe with high and growing debt. In this environment, it will be imperative for national fiscal authorities to ingrain credibility in macroeconomic assumptions in conjunction with a well-anchored fiscal path. EMEs should also be encouraged to devise and implement policies aimed at longer-term sustainable growth, given that shifting towards higher income boosts the resilience of both growth and inflation to debt shocks.

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Debt Shocks and the Dynamics of Output and Inflation in Emerging Economies

This paper analyzes how public debt shocks affect output and inflation in 34 emerging market economies during 2000 to 2022 using panel local projections. Unexpected increases in public debt lead to significant declines in real gross domestic product and increases in inflation. Initial debt levels, domestic financial conditions, and income levels intensify the gross domestic product decline, while tighter global financial conditions mitigate these effects. Inflation impacts vary depending on fundamentals. The paper also identifies nonlinearities in the dynamics, with amplified effects during economic downturns.

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