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The Interest Rate Effects of Government Debt and Deficits: Does Domestic Borrowing Have a Different Impact Than Foreign Borrowing?*

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Abstract

We investigate the relationship between government debt and interest rates. We ask whether the effect of government debt on interest rates depends on whether that debt is financed at home or abroad. We extend the work of previous studies that have estimated the effect of expected government debt or deficits on interest rates, and we add an international dimension by incorporating forecasts of the current account balance or net foreign asset position. We find that an increase in government debt financed from domestic savings has less of an effect on interest rates than an increase in government debt financed by foreign borrowing, and government debt has less of an effect on interest rates in a country that is a net international creditor than one that is a net international debtor.

JEL Classification: E6, F3, F4, H6

Keywords: government bond yields, government debt, current account

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1 Introduction

There is a substantial literature estimating the effect of government debt and deficits on sovereign bond yields (see e.g. Laubach, 2009; Gruber and Kamin, 2012; Plante et al., 2026; Ehrlich et al., 2026). This literature finds that increasing debt and deficits lead to higher interest rates, yet the last 20 years have seen a huge increase in government debt and deficits worldwide without a substantial increase in long-term interest rates. In addition a country like Japan has the largest stock of government debt among advanced economies yet it also has some of the lowest long-term interest rates. This leads one to ask if who finances that debt matters? Does government debt or deficits financed by domestic savings have a different effect on interest rates than government debt or deficits financed with foreign borrowing?

There is considerable heterogeneity across time as to whether government deficits are financed by domestic savings or foreign borrowing. Figure 1 plots the government net saving, private sector net saving, and their sum, the current account, for a number of major advanced economies.[1] In most countries, the periods of the highest government borrowing, particularly the 2008 and 2020 crises, was also the period with the highest private sector savings, keeping the current account fairly stable. In the United States, the period of the greatest foreign borrowing was not when the government budget deficit neared 15% of GDP during these two crises, but during the period 2004-2007, when government budget deficits combined with negative private sector net savings to produce a current account deficit of around 6% of GDP.[2]

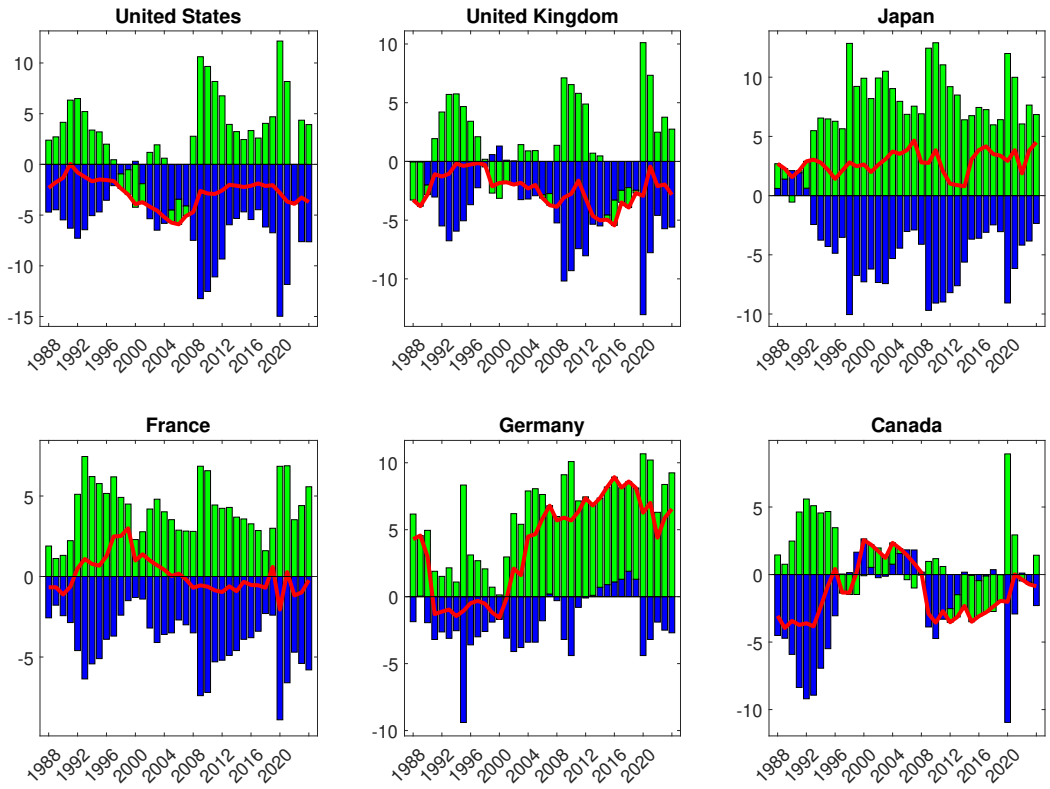
The figure also shows that there is heterogeneity across countries as to whether government deficits are financed from domestic savings or foreign borrowing. Japan has run large government budget deficits every year since the mid-1990s, but high private sector savings means the current account has stayed positive. Figure 2 presents gross government debt and the net foreign liability position for the same countries. As a share of GDP, Japan's gross government debt is the highest among advanced economies, but Japan is a net creditor with the nest of the world with a negative net foreign liability position.[3]

[1] Appendix figures show similar charts for 13 additional advanced economies. The government budget surplus is not exactly equal to government net savings, but it's close. So for the purpose of this figure, the budget surplus is a proxy for government net savings. Private net savings is then the current account minus the government budget surplus.

[2] The fact that government deficits are offset by private sector savings during a large global shock like the 2020 Covid shock is almost a tautology, the world current account is equal to zero, so if all governments react to a common shock by borrowing more, and private sector agents behave similarly across countries, private sector savings must rise by the same amount as government borrowing.

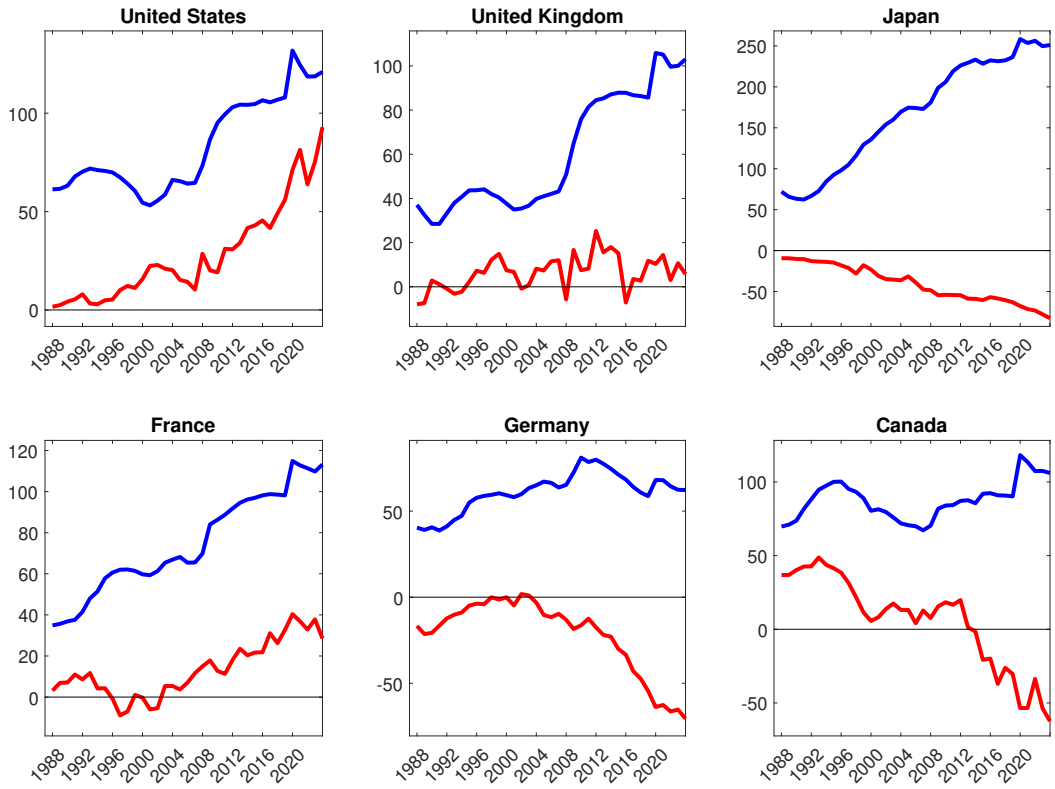
[3] There has been a significant deterioration in the U.S. net foreign asset position over this period, however, as discussed by Atkeson et al. (2022), this is not due to increased borrowing but rather relative equity valuation effects due to the relatively strong performance of the U.S. stock market. This raises the value of U.S. equity assets held by non-U.S. residents relative to the value of non-U.S. equity assets held by U.S. residents.

Figure 1: Government net saving, private net saving, and current account (percent of GDP)



Notes: Blue bars represent government net saving (negative of budget deficit). Green bars show private net saving (current account minus government net saving). Red line indicates the current account.
Source: Global Macro Database from Müller et al. (2025).

Figure 2: Government debt and net foreign liability position (percent of GDP)



Notes: Blue line shows gross government debt, and the red line shows the net foreign asset position.
Source: Global Macro Database from Müller et al. (2025) and External Wealth of Nations Database from Lane and Milesi-Ferretti (2007).

Given this heterogeneity both across time and across countries in the relationship between government borrowing and total national borrowing, we pose two separate but related questions. First, does government debt financed from domestic savings affect interest rates differently than debt financed through foreign borrowing? Second, does government debt have a different effect on interest rates in a country that is a net creditor with the rest of the world than a country that is a net debtor with the rest of the world?

The empirical literature on government debt's effect on interest rates shows varying results. Engen and Hubbard (2004) highlight the wide range of findings, with some studies finding no effect and others reporting large positive effects. Engen and Hubbard (2004) and Laubach (2009) demonstrate that model specification matters significantly, particularly whether forward-looking expectations or current fiscal measures are used as independent variables. Due to the endogeneity of government debt, they argue that forecasts of government debt or deficits make better independent variables than current values.

Both studies show that in the U.S., a one percentage point increase in expected future debt raises long-term interest rates by 3-4 basis points, while a one percentage point increase in the expected deficit-to-GDP ratio increases forward rates by 20-30 basis points. Gale and Orszag (2004) find similar results, with a 1 percentage point increase in the expected deficit-to-GDP leading to a 25-35 basis point increases in long-term rates.

More recent studies using U.S. data find slightly smaller effects. Gamber and Seliski (2019), using data through 2017, estimate that a one percentage point increase in expected debt raises long-term rates by 2-3 basis points. Neveu and Schafer (2024), with data through 2023, find approximately a 2 basis point effect, at the lower end of earlier estimates.

Plante et al. (2026) argue that debt non-stationarity complicates estimation, particularly in a more recent sample. They recommend estimating in differences rather than levels. Their differenced regression finds a more precise 3 basis point effect from a one percentage point debt increase, and a 16 basis point effect for every 1 percentage point increase in the deficit.

Using a different approach and instead using the results from parliamentary elections and the formation of coalition governments as a predictor of future government debt levels, Ehrlich et al. (2026) estimate that a 1 percentage point increase in government debt leads to a 5.6 basis point increase in long-term interest rates.

International studies show similar patterns. In a panel of OECD countries, Gruber and Kamin (2012) apply Laubach (2009)'s methodology with two-year-ahead projections of government debt and deficits. They also find significant effects on long-term interest rates, although slightly smaller than U.S.-focused studies.

All of these papers treat debt and borrowers as homogeneous. They estimate the effect of debt or deficits on interest rates, but they do not distinguish whether that debt was financed with domestic savings or foreign borrowing. They do not distinguish between debt in a

country that is a net debtor with the rest of the world and one that it a net creditor.

Our paper extends the approach of these earlier papers by adding forecasts of a country's current account or net foreign asset position. This allows us to observe whether an increase in government borrowing is accompanied by an increase in total foreign borrowing. It also allows us to observe whether the country is a net creditor or net debtor with the rest of the world.

We follow Gruber and Kamin (2012)'s panel data approach by using forecasts from 19 OECD countries. This allows us to take advantage of the fact that across countries there is considerable variation in current account and net foreign asset positions.

The estimation specification in these earlier papers allows for one marginal effect of government debt on interest rates. In this paper the marginal effect of government borrowing on interest rates will instead be a function of a country's overall external position and whether government borrowing is financed by domestic savings or increased foreign borrowing.

This approach helps answer the two questions posed earlier. We show that an increase in government debt or deficits that is financed by domestic savings (leaving the current account or net foreign asset position unchanged) has less of an effect on bond yields than an increase in government borrowing that results in more foreign borrowing (leading to a fall in the current account or net foreign asset position). Furthermore we show that regardless of how it's financed, an increase in government borrowing in a country that is a net creditor with the rest of the world has less of an effect on bond yields than the same increase in government borrowing in a country that is a net debtor.

Roughly speaking, across regression specifications, we find that the marginal effect on long-term rates of an increase in government debt or deficits in a net creditor country financing that borrowing from domestic savings is about half the marginal effect for a net debtor financing from foreign borrowing.

While this paper is empirical, it is helpful to understand the various channels through which government borrowing can lead to higher interest rates. Gruber and Kamin (2012) list the following:

1. Crowding out: Larger deficits create greater resource competition, raising equilibrium interest rates.

2. Portfolio balance: Investors may demand higher rates to devote a larger share of their portfolio to government debt.

3. Inflation expectations: Fears of debt monetization can increase inflation premiums (see e.g. Brandao-Marques et al., 2024).

4. Default risk: Larger debts may increase expectations of government default, raising risk premiums.

All of these channels would potentially be mitigated if the government's debt were held by domestic residents. For the crowding out channel: if government deficits are used to finance increased transfer payments to domestic residents, then increased government spending doesn't entail increased resource use, just the transfer from one sector to another.[4] For the portfolio balance channel: a government deficit that finances increased domestic transfers or lower domestic taxes would increase the overall size of the portfolio of private domestic investors, so a greater quantity of government bonds does not lead to as much of an increase in the share of investor portfolios dedicated to government bonds. For the inflation expectations channel: a central bank would be more reluctant to monetize a debt if that debt is held by its own citizens than if that debt were held by foreigners. For the default risk channel: a government with taxing power has the power (if not the political will) to recoup debt and interest payments made to citizens.

While this argument relates to Ricardian equivalence, which Barro (1989) supported by noting the weak correlation between government deficits and current accounts shown in Figure 1, we take no prior position on this theory. Instead, we empirically investigate whether the effect of expected government borrowing on interest rates depends on expected changes in total national borrowing.

In the next section, we present the econometric methodology and discuss the data. We discuss some of the key econometric issues that led to the specification in Laubach (2009) or Gruber and Kamin (2012). We present the results in section 3, and here we include a special discussion of how using projected net foreign asset positions or current accounts in this specification can help answer the two questions raised earlier in Figure **??**. Finally section 4 concludes.

2 Data and Methodology

Our methodology is largely built upon that of Gruber and Kamin (2012). They follow Engen and Hubbard (2004) and Laubach (2009) in introducing fiscal variables as forecasts instead of current values in a regression of interest rates on government debt or deficits.

Both the interest rate and fiscal variables are endogenous with respect to the business cycle. In a downturn fiscal deficits and debt tend to increase and at the same time the monetary authority cuts interest rates. This leads to a negative correlation between the fiscal variable and the interest rate that would obscure the positive effect of higher debt leading to higher interest rates. In their review of the literature, Engen and Hubbard (2004)

[4]Davis and Derr (2025) show that across OECD countries, much of the increase in government deficits in the 2008 crisis and all of the increase in government deficits in the Covid crisis were due to increased transfers to domestic residents.

find that empirical studies regressing current interest rates on current levels of government debt or deficits lead to inconclusive results. Because of this endogeneity, Engen and Hubbard (2004) and Laubach (2009) introduce fiscal variables as forecasts, 5-year ahead forecasts from the CBO.

In a panel regression using annual data, Gruber and Kamin (2012) regress the long-term government bond interest rate on 2-year ahead projections of real GDP growth, inflation, government debt, government deficits from the OECD Economic Outlook. To then consider how a country's external balance would affect these estimated effects of government debt and deficits, we add 2-year ahead projections of the current account and net foreign asset position.[5]

We estimate the following panel data regression

$$i^{lt}_{j,t} = \alpha_t + \alpha_j + \beta_1 i^{lt}_{j,t-1} + \beta_2 i^{3m}_{j,t} + \beta_3 g^{e,2}_{j,t} + \beta_4 \pi^{e,2}_{j,t} + \beta_5 D^{e,2}_{j,t} + \beta_6 F^{e,2}_{j,t} D^{e,2}_{j,t} + \beta_7 F^{e,2}_{j,t} + \epsilon_{j,t} \quad (1)$$

where $i^{lt}_{j,t}$ is a long-term government bond interest rate in country j in year t. We present results using both the 10yr interest rate and the 5yr-5yr forward interest rate. $i^{3m}_{j,t}$ is the yield on 3-month government debt, $g^{e,2}_{j,t}$ is the forecasted real GDP growth rate in two years from the OECD Economic Outlook (December version), $\pi^{e,2}_{j,t}$ is the forecast for inflation in two years, and $D^{e,2}_{j,t}$ is the forecasted government deficit or debt in two years (either gross government debt/GDP, net government debt/GDP, the government budget balance/GDP, or the primary government budget balance/GDP).

All terms in this regression through β_5 appear in Gruber and Kamin (2012). We add a sixth and seventh term, $F^{e,2}_{j,t} \times D^{e,2}_{j,t}$ and $F^{e,2}_{j,t}$, where F is a measure of the forecasted external deficit or debt. In the regression that includes the government overall or primary deficit in the variable D, the variable F is the forecasted current account/GDP ratio in two years from the OECD Economic Outlook. In the regression specification that includes the government gross or net debt in the variable D, the variable F is the forecasted net external asset/GDP ratio in two years.[6] In the estimation all interest rate variables are expressed

[5]Later in the robustness section we replace these 2-year ahead expectations from the OECD with 5-year ahead expectations of the same variables from the IMF. The results hold in the IMF data. Although prior to 2009 these IMF forecasts were not publicly available, so we use them as a robustness check, not the headline results.

[6]The projection of the net external asset position is not directly reported by the OECD, but a projection can be constructed from the current net foreign asset position and the other OECD forecasts we are using. If nfa_t is the net external asset position as a share of GDP calculated from the Lane and Milesi-Ferretti (2007) External Wealth of Nations database (December 2025 update), then using the forecasts from the OECD, the forecast of the net external asset position in year $t+1$ based on information known in year t, $nfa^{e,1}_t$ is $nfa^{e,1}_t = \frac{nfa_t}{(1+.01*g^{e,1}_t)(1+.01*\pi^{e,1}_t)} + ca^{e,1}_t$, where $g^{e,1}_t$ is the year t OECD forecast for real GDP growth in year $t+1$, $\pi^{e,1}_t$ is the year t OECD forecast for inflation in year $t+1$, and $ca^{e,1}_t$ is the year t

in basis points. The GDP growth, inflation, government debt and deficit, net foreign asset, and current account variables are all written as percentage points.

Plante et al. (2026) argue that government debt non-stationarity in recent decades puts a downward bias on the estimation of the key regression coefficients in equation 1 and argue that this equation should instead be estimated in differences. Later in the robustness section we discuss how we rerun everything using differences instead of levels and the results hold.

The model is estimated using annual data from 1988-2024. The OECD Economic Outlook is released twice a year, in June and December. Like Gruber and Kamin, we only use the December forecasts since that is the only one with 2-year-ahead forecasts. All interest rates in the estimation are simply December averages. In the appendix we rerun all results with a time period ending in 2007, as in the original Gruber and Kamin (2012) paper, and show that our results hold in that earlier sample as well.

Each regression is an unbalanced panel and includes data from the following 19 countries: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Spain, Sweden, the United Kingdom, and the United States. Due to the effects of the Eurozone debt crisis in the second half of our sample, with large swings in debt levels, spikes in interest rates, and forced austerity, we exclude the Eurozone periphery countries: Greece, Ireland, Spain, and Italy, during the post-2008 sample period.

Gruber and Kamin (2012) find that the estimated value of β_5 is positive and statistically significant, indicating that higher government debt or deficits raises the long term interest rate. By adding external debt or deficit forecasts to the regression, we allow the marginal effect of government debt or deficits, D, on the interest rate to depend on a country's external debt or deficit position, F. Take the derivative of equation (1):

$$di^{lt}_{j,t} = \beta_1 di^{lt}_{j,t-1} + \beta_5 dD^{e,2}_{j,t} + \beta_6 F^{e,2}_{j,t} dD^{e,2}_{j,t} + \beta_6 D^{e,2}_{j,t} dF^{e,2}_{j,t} + \beta_7 dF^{e,2}_{j,t} + ... \tag{2}$$

where for brevity we are only showing the derivatives related to D or F. For concreteness, consider a country that is a net creditor with $F^{e,2}_{j,t} = \bar{F}$ versus a country that is a net debtor with $F^{e,2}_{j,t} = -\bar{F}$. Also consider the case where a country finances an increase in government debt or deficits through external borrowing, $dF^{e,2}_{j,t} = -dD^{e,2}_{j,t}$ versus the case where a country finances an increase in government borrowing from domestic savings, leaving external borrowing unchanged, $dF^{e,2}_{j,t} = 0$. Then for a country with a level of government debt or deficit $D^{e,2}_{j,t} = \bar{D}$, the marginal effect of an increase in government borrowing on the interest rate, $\frac{di^{lt}_{j,t}}{dD^{e,2}_{j,t}}$ will depend on whether the country is an external debtor or creditor and

OECD forecast for the current account in year $t+1$. After calculating $nfa^{e,t}_{t+1}$, the $t+2$ forecast, $nfa^{e,2}_t$ is $nfa^{e,2}_t = \frac{nfa^{e,1}_t}{(1+.01*g^{e,2}_t)(1+.01*\pi^{e,2}_t)} + ca^{e,2}_t$

whether that increase in borrowing was financed at home or abroad:

	Creditor	Debtor
Financed Home	$\frac{\beta_5+\beta_6\bar{F}}{1-\beta_1}$	$\frac{\beta_5-\beta_6\bar{F}}{1-\beta_1}$
Financed Abroad	$\frac{\beta_5+\beta_6\bar{F}+\beta_6\bar{D}-\beta_7}{1-\beta_1}$	$\frac{\beta_5-\beta_6\bar{F}+\beta_6\bar{D}-\beta_7}{1-\beta_1}$

where these marginal effects in the levels regression incorporate the effect of the lag in the dependent variable, given by the parameter β_1 (thus these marginal effects are what Gruber and Kamin call long-run effects).

In the introduction we posed two separate, but related questions. First, is the effect of government borrowing on the interest rate different for external creditor and external debtor countries? The previous table shows that in this regression specification the answer to that question depends on the sign and significance of β_6. Second, does the effect of an increase in government borrowing on the interest rate depend on whether that borrowing was financed through domestic or foreign borrowing? The table above shows that the answer to that question depends on the sign and significance of β_6 and β_7.

3 Results

The estimation results using the 10yr interest rate as the long-term interest rate are presented in Table 1. The results using the 5yr-5yr forward as the long-term interest rate are presented in Table 2.

Fluctuations in both long-term interest rates are persistent, and the lag of the dependent variable enters with a coefficient of around 0.5-0.6. The 3m interest rate has a positive and significant effect on both long-term rates, although the coefficient on the 3m interest rate is much smaller in the regression of the 5yr-5yr forward. Expectations of future GDP growth have a positive effect on the long-term rates, and a 1 percentage point increase in expected GDP growth raises long-term rates by about 8 basis points, although this is not always statistically significant. The expectation for future inflation has a strong positive effect on the 10yr rate, where a 1 percentage point increase in expected inflation leads to a nearly 20 basis point increase in the 10yr rate. The effect is smaller and not always statistically significant in the regression of the 5yr-5yr forward.

The odd numbered columns in the tables repeat the exercise from Gruber and Kamin (2012). Column 1 presents the results from the regression on gross government debt, column

3 on net government debt, column 5 on the overall budget deficit, and column 7 on the primary budget deficit. As in Gruber and Kamin (2012), government debt or deficits have a positive and significant effect on both the 10yr interest rate and the 5yr-5yr forward.

Moving to the even numbered columns we see the effect of adding the external balance, either the net foreign asset position or the current account, and its interaction with government debt or deficits. In the next section we will compute the marginal effects of an increase in government debt or deficits, but for now we can see that in every regression, the interaction between the measure of government balance and the total external balance, the β_6 coefficient in equation (1) is negative and significant, indicating that the marginal effect of the same government debt or deficits is lower in a country that is a net external creditor than a country that is a net external debtor.

Table 1: Regression of 10yr interest rate

	Dependent Variable: i_t^{lt}							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
i_t^{st}	0.225***	0.229***	0.231***	0.234***	0.225***	0.232***	0.222***	0.228***
	(0.017)	(0.030)	(0.019)	(0.038)	(0.016)	(0.031)	(0.018)	(0.037)
i_{t-1}^{lt}	0.487***	0.486***	0.506***	0.482***	0.476***	0.465***	0.488***	0.483***
	(0.024)	(0.023)	(0.030)	(0.030)	(0.024)	(0.031)	(0.026)	(0.035)
$g_t^{e,2}$	8.330**	8.061*	6.145*	6.197	4.737	5.325	2.769	4.517
	(3.386)	(4.856)	(3.651)	(5.412)	(3.154)	(4.312)	(3.494)	(5.173)
$\pi_t^{e,2}$	17.971***	19.352***	16.531***	18.273***	19.315***	19.325***	15.980***	16.126**
	(3.261)	(6.190)	(3.520)	(6.124)	(3.247)	(6.794)	(3.539)	(6.823)
$D_{gross,t}^{e,2}$	0.424***	0.478***						
	(0.090)	(0.105)						
$D_{gross,t}^{e,2} F_{nfa,t}^{e,2}$		-0.003**						
		(0.001)						
$D_{net,t}^{e,2}$			0.190***	0.498***				
			(0.069)	(0.097)				
$D_{net,t}^{e,2} F_{nfa,t}^{e,2}$				-0.003***				
				(0.000)				
$D_{Def,t}^{e,2}$					3.696***	5.672***		
					(0.790)	(1.885)		
$D_{Def,t}^{e,2} F_{CA,t}^{e,2}$						-0.347***		
						(0.088)		
$D_{Pri,t}^{e,2}$							0.985	2.917*
							(0.806)	(1.629)
$D_{Pri,t}^{e,2} F_{CA,t}^{e,2}$								-0.259***
								(0.097)
$F_{NFA,t}^{e,2}$		0.167*		0.059***				
		(0.087)		(0.009)				
$F_{CA,t}^{e,2}$						-1.181**		-1.214**
						(0.508)		(0.533)
R2	0.985	0.985	0.984	0.985	0.985	0.985	0.982	0.982
Obs.	583	583	531	531	609	609	540	540

The dependent variable in each regression is the 10 year interest rate i_t^{10y}. i_t^{3m} is the 3m interest rate, $g_t^{e,2}$ is the expectation for real GDP growth in two years, $\pi_t^{e,2}$ is the expectation for inflation in two years, $D_{gross,t}^{e,2}$ is the expectation for the level of gross government debt in two years, $D_{net,t}^{e,2}$ is the expectation for the level of net government debt in two years, $D_{Def,t}^{e,2}$ is the expectation for the level of the government budget deficit in two years, $D_{Pri,t}^{e,2}$ is the expectation for the level of the government primary budget deficit in two years, $F_{NFA,t}^{e,2}$ is the expectation for the level of the net foreign asset position in two years, and $F_{CA,t}^{e,2}$ is the expectation for the level of the current account in two years. Standard errors clustered by country in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 2: Regression of 5yr-5yr forward interest rate

	Dependent Variable: i_t^{5y5y}							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
i_t^{st}	0.063***	0.072**	0.065***	0.073**	0.068***	0.077**	0.053**	0.061
	(0.023)	(0.032)	(0.025)	(0.034)	(0.022)	(0.034)	(0.025)	(0.043)
i_{t-1}^{lt}	0.566***	0.562***	0.565***	0.538***	0.572***	0.561***	0.610***	0.605***
	(0.037)	(0.030)	(0.039)	(0.035)	(0.034)	(0.047)	(0.039)	(0.043)
$g_t^{e,2}$	8.798**	7.921	7.567*	6.925	7.320**	7.899*	3.315	6.198
	(3.839)	(5.761)	(4.048)	(6.007)	(3.543)	(4.776)	(4.016)	(6.193)
$\pi_t^{e,2}$	7.008*	9.472	6.619	8.669	10.603***	10.217*	6.840	6.797
	(4.042)	(6.395)	(4.252)	(6.393)	(3.884)	(6.097)	(4.363)	(5.976)
$D_{gross,t}^{e,2}$	0.566***	0.624***						
	(0.103)	(0.154)						
$D_{gross,t}^{e,2} F_{nfa,t}^{e,2}$		-0.003***						
		(0.001)						
$D_{net,t}^{e,2}$			0.414***	0.620***				
			(0.087)	(0.149)				
$D_{net,t}^{e,2} F_{nfa,t}^{e,2}$				-0.002***				
				(0.001)				
$D_{Def,t}^{e,2}$					5.946***	7.198***		
					(0.864)	(2.280)		
$D_{Def,t}^{e,2} F_{CA,t}^{e,2}$						-0.277***		
						(0.101)		
$D_{Pri,t}^{e,2}$							1.849**	3.732*
							(0.867)	(2.143)
$D_{Pri,t}^{e,2} F_{CA,t}^{e,2}$								-0.247*
								(0.129)
$F_{NFA,t}^{e,2}$		0.188***		0.019				
		(0.067)		(0.015)				
$F_{CA,t}^{e,2}$						-0.942		-1.525*
						(0.746)		(0.826)
R2	0.979	0.979	0.978	0.979	0.979	0.980	0.974	0.975
Obs.	522	522	491	491	547	547	496	496

The dependent variable in each regression is the 5yr-5yr forward interest rate i_t^{5y5y}. For other variable definitions see notes to Table 1.

3.1 Marginal effect of an increase in debt or deficits

In the original Gruber and Kamin (2012) specification, the marginal effect of an increase in government debt or deficits on interest rates is the same for all countries. But in our specification this marginal effect becomes a function of a country's external position (the net foreign asset position or the current account), and how much that external position is expected to change in response to an expected change in government debt or deficits.

While this marginal effect lies on a continuum, given by equation (2), for concreteness we can calculate the marginal effect in four cases, whether a country is a net creditor or net debtor, and whether the increase in government borrowing was financed at home or abroad.[7]

The top half of Table 3 presents these marginal effects from the regression of the 10yr interest rate, and the bottom half of the panel presents the marginal effects from the regression of the 5yr-5yr forward interest rate. The table shows the marginal effect (in basis points) of a 1 percentage point increase in gross government debt, net government debt, the overall budget deficit, and the primary budget deficit.

Starting with the regressions on gross and net government debt, the marginal effect of a 1 percentage point of GDP increase in gross government debt to GDP ratio on the 10yr interest rate ranges from around +0.7 basis points for net creditors to +1.2 basis points for a net debtor that finances the increase in debt from foreign borrowing. In the regression that does not distinguish between home and foreign borrowing, Gruber and Kamin (2012) estimate the effect to be 0.8 basis points. The marginal effect for the representative net external debtor is 0.4 basis points higher than the marginal effect for the representative net creditor. The marginal effect of a 1 percentage point increase in debt financed by foreign borrowing is 0.1 basis points higher than the same debt financed from domestic savings.

The marginal effect on the 5yr-5yr forward of the same increase in gross debt is higher, and ranges from around +1.1 basis points for a net creditor financing at home to +2 for a net debtor financing abroad. The difference in marginal effects between a debtor and a creditor is about 0.6 basis points, and the difference between debt financed abroad and debt financed at home is about 0.2 basis points.

The marginal effects of a 1 percentage point increase in net government debt are similar, ranging from +0.7 for the creditor financing at home to +1.2 for the debtor financing abroad.

[7]When presenting marginal effects results, we need to put a numerical value on the initial value of $\bar{F}$. Using a simple average of the absolute value of the net foreign asset position or current account across the countries in our sample, we define a representative net creditor to be a country with a net foreign asset position equal to +40% of GDP or a current account equal to +3% of GDP. A representative net debtor is the opposite, with a net foreign asset position equal to -40% and a current account equal to -3%. At the same time, to calculate the marginal effect of an increase in debt or deficits financed abroad we need to pin down the initial value of government debt or deficits, $\bar{D}$. Using the simple average across the countries in our sample, in the regression of gross debt, $\bar{D} = 81\%$, in the regression of net debt, $\bar{D} = 35\%$, in the regression of the overall budget deficit $\bar{D} = 1.5\%$, and in the regression of the primary deficit, $\bar{D} = -0.8\%$.

The difference between the net debtor and the net creditor or between financing abroad and financing at home is again statistically significant. Again, these marginal effects are larger for the 5yr-5yr forward interest rate.

The marginal effect of a 1 percentage point increase in the deficit-to-GDP ratio ranges from about +8.5 basis points for a net creditor financing at home to +16 basis points for a net debtor financing abroad. The difference between the marginal effects for a net debtor and a net creditor is about 3 basis points. Meanwhile the difference between the marginal effect of debt financed abroad and debt financed at home is about 4 basis points.

One potential caveat to any results for the overall budget deficit is that the deficit includes interest payments. So the last panel in the table calculates the marginal effect of an increase in the primary budget deficit. Here the marginal effect ranges from about 4 basis points (and statistically indistinguishable from zero) for a net creditor financing at home to 9 basis points for a net debtor financing abroad. Again the difference between the marginal effects for a net debtor and a net creditor, or between debt financed abroad and debt financed at home is positive and statistically significant.

The marginal effect of the increase in the deficit on the 5yr-5yr forward is slightly larger, ranging from 15 basis points to 21 basis points for the overall deficit and 7.5 to 15 basis points for the primary deficit. again, the difference in marginal effects between debtors or creditors or between financing abroad or financing at home is positive and statistically significant.

In general, the marginal effect of an increase in the debt or deficit for a net creditor financing at home is about half the marginal effect of the same increase in debt or deficits for a net debtor financing abroad.

In the regressions of gross and net debt, most of this difference is because of the difference between the net debtor and the net creditor (moving left to right in the table). While statistically significant, the difference between debt financed abroad and debt financed at home is smaller. Meanwhile, for the overall and primary budget deficit, slightly more than half of this difference is due to the difference between financing abroad and financing abroad, and the rest is due to the difference between a net debtor and a net creditor.

When calculating the marginal effect of the deficit, the external position is represented by the current account, and the current account is simply equal to government net savings plus private sector net savings, so if we observe the government deficit and the current account, we know private sector savings. When calculating the marginal effect of debt, the external position is represented by the net foreign asset position. As shown in Atkeson et al. (2022), shifts in the net foreign asset position are driven not only by government and private sector borrowing, but by equity valuation effects and their effects on the net external liability position. External equity liabilities cannot be defaulted on, so a country's net external position gives us less information about long-term debt sustainability.

Table 3: Marginal effect of debt and deficits on long-term interest rates

10y Interest Rate:

Gross Debt:

	Creditor	Debtor
Financed Home	0.726***	1.134***
Financed Abroad	0.813***	1.222***
Difference top to bottom	0.088*	
Difference left to right	0.409**	

Net Debt:

	Creditor	Debtor
Financed Home	0.749***	1.173***
Financed Abroad	0.816***	1.239***
Difference top to bottom	0.067***	
Difference left to right	0.424***	

Deficit:

	Creditor	Debtor
Financed Home	8.656***	12.553***
Financed Abroad	11.838***	15.735***
Difference top to bottom	3.182***	
Difference left to right	3.897***	

Primary Deficit:

	Creditor	Debtor
Financed Home	4.140	7.141**
Financed Abroad	6.086**	9.087**
Difference top to bottom	1.946*	
Difference left to right	3.001***	

5y5y Forward Interest Rate:

Gross Debt:

	Creditor	Debtor
Financed Home	1.119***	1.734***
Financed Abroad	1.311***	1.926***
Difference top to bottom	0.192***	
Difference left to right	0.615***	

Net Debt:

	Creditor	Debtor
Financed Home	1.146***	1.537***
Financed Abroad	1.271***	1.662***
Difference top to bottom	0.126***	
Difference left to right	0.391***	

Deficit:

	Creditor	Debtor
Financed Home	14.498***	18.279***
Financed Abroad	17.587***	21.368***
Difference top to bottom	3.089*	
Difference left to right	3.781***	

Primary Deficit:

	Creditor	Debtor
Financed Home	7.582*	11.332**
Financed Abroad	10.946**	14.695**
Difference top to bottom	3.364	
Difference left to right	3.750**	

Computes the marginal effects from the regression equations using the specification in the table in section 2. Computed using the regression results in Tables 1 and 2. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

3.2 Robustness Tests

The potential endogeneity of current government debt or deficits will add a negative bias to any estimates of the effects of fiscal positions on interest rates. U.S. based studies are able to use 5-year ahead forecasts. In international data, 2-year ahead forecasts are the best publicly available. In this study we focus on international data since we are looking for variation in current accounts and net foreign asset positions.

In the appendix we rerun everything using 5-year ahead forecasts from the IMF. These are observed twice a year since 1990 as part of the IMF World Economic Outlook. Prior to 2009 the forecasts of government debt and deficits were not made public, and were only used as inputs into other forecasts. Our results using these IMF 5-year ahead forecasts are both qualitatively and quantitatively similar to those using the 2-year ahead OECD forecasts, even though these IMF forecasts were not publicly available for more than half of our sample period. This suggests that even though these forecasts are not publicly available, market participants could infer something similar using publicly available data. However, since the IMF forecasts are not publicly available we keep those results as a robustness check and focus on the OECD forecasts in the main text.

In addition, Plante et al. (2026) argue that debt non-stationarity complicates estimation using the Laubach (2009) specification. Government debt levels have been steadily increasing over time and interest rates have been decreasing, so a regression in levels will pick up a spurious negative correlation between the two. In their study focusing on U.S. data, Plante et al. (2026) estimate in differences, not levels. When using a panel of international data, Gruber and Kamin (2012), instead add a time fixed effect, α_t, to account for this common trend in government debt levels and interest rates. But as a robustness check we also follow the Plante et al. (2026) specification, the results hold and are presented in the appendix.

4 Conclusion

We provide evidence that the effect of government debt on long-term interest rates depends on whether the borrower is a net international creditor or net international debtor, and whether new debt is financed by domestic savers or foreign borrowers. This finding helps resolve two apparent paradoxes in the data: why countries like Japan maintain low interest rates despite extraordinarily high government debt levels, and why interest rates remained low in most countries despite surges in government borrowing during the 2008 crisis and the Covid crisis.

We show that these distinctions hold across multiple types of government debt (both gross and net debt) and multiple types of government deficits (both overall and primary deficits), and in a regression in levels and one in first differences. In general the effect of

government debt or deficits on interest rates in a net international creditor financing that government borrowing from domestic savings is about half the effect of the same government borrowing in a net international debtor financing from foreign borrowing.

While our findings do not diminish the importance of fiscal sustainability over the long term, they provide a more nuanced framework for analyzing the short and medium-term effects of fiscal policy, particularly during economic crises when domestic saving tends to increase. Government borrowing need not always crowd out private investment or trigger higher interest rates—its effects depend critically on whether that borrowing is offset by changes in private saving behavior.

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