THE EFFECTS OF GOVERNMENT SPENDING ON REAL EXCHANGE RATES: EVIDENCE FROM MILITARY SPENDING PANEL DATA*

Wataru Miyamoto
Bank of Canada

Thuy Lan Nguyen
Santa Clara University

Viacheslav Sheremirov
Boston Fed

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Abstract: Using panel data on military spending for 125 countries, we document new facts about the effects of changes in government purchases on the real exchange rate, consumption, and current accounts in both advanced and developing countries. While an increase in government purchases appreciates real exchange rates and increases consumption significantly in developing countries, it depreciates real exchange rates and decreases consumption in advanced countries. The current account deteriorates in both groups of countries. These findings are not consistent with standard international business cycle models. We investigate whether the difference in the responses of real exchange rates to spending shocks between advanced economies and developing countries can be explained by alternative hypotheses.

Keywords: military spending, fiscal policy, real exchange rates, twin deficit, risk sharing
JEL Classification: E3, F3, F4

*Miyamoto: wmiyamoto@bankofcanada.ca. Nguyen: tlnguyen@scu.edu. Santa Clara University, Economics Department, 500 El Camino Real, Santa Clara, CA 95053. Sheremirov: viacheslav.sheremirov@bos.frb.org. Federal Reserve Bank of Boston, Research Department T-9, 600 Atlantic Ave, Boston, MA 02210. We thank Yuriy Gorodnichenko, Andrew Levin, and seminar participants at the IMF, Bank of Canada, and the 2016 Asia meeting of the Econometric Society for comments and suggestions. Nikhil Rao and Brock Santi provided excellent research assistance. The views expressed herein are those of the authors and are not necessarily those of the Bank of Canada, the Federal Reserve Bank of Boston, or the Federal Reserve System.

1 Introduction

How does government spending affect the current account and real exchange rate? Conventional wisdom—as well as mainstream macroeconomic models used by policymakers—suggests that an increase in government spending puts pressure on the domestic currency to appreciate, leading to current account deterioration (and potentially a "twin deficit") and to a decrease in consumption through an international risk sharing condition. This mechanism holds across a wide range of models including both New Keynesian and neoclassical models. However, empirical evidence for such a mechanism has not been settled. For example, Corsetti and Müller (2006) and Kim and Roubini (2008) find that the trade balance improves after a government spending shock in the U.S. data. In contrast, using the data for Australia, Canada, the United Kingdom, and the United States, Monacelli and Perotti (2010) and Ravn, Schmitt-Grohé, and Uribe (2012) estimate that a rise in government spending causes a trade balance deficit, as well as a real depreciation of the domestic currency and an increase in consumption. Given these contrasting empirical results in studies of a relatively small number of countries, several questions on the effects of government spending in an open economy remain: First, does government spending cause the domestic currency to appreciate in real terms and does it worsen the current account? Second, do the effects of government spending shocks differ across countries, especially between advanced and developing countries? Third, are there any other country characteristics, such as an exchange rate regime or openness to trade, that can affect the transmission mechanism of government spending shocks?

This paper addresses these important questions using a large dataset for 125 countries between 1989 and 2013. We provide new evidence on the effects of government spending on the real exchange rate, current account, and consumption. Importantly, we exploit the information in both advanced and developing countries to differentiate between the effects of government spending in these two groups. Our data also let us examine the differential effects of government spending depending on exchange rate regimes and the level of trade openness. Since government spending can affect the state of the economy and vice versa, we identify government spending shocks using exogenous variation in international military spending. This approach has been used in the closed economy literature (e.g., Hall 2009, Barro and Redlick 2011, Ramey 2011), but remains underutilized in the open economy literature.

We document a number of new empirical facts: First, in response to a positive government spending shock, the real exchange rate appreciates on impact, and the effect is significant up to a two-year horizon. After an increase in government spending of 1 percent of GDP, the real exchange rate appreciates by over 3 percent on impact and up to 5 percent two years after the shock. The effect is most pronounced in countries with a flexible exchange rate regime. Consistent with Monacelli and Perotti (2010), we also find that the current account deteriorates significantly in response to a positive government spending shock. Consumption increases substantially, peaking at about 5 percent two years after the change in government spending.

Second, the effects of government spending on the real exchange rate and consumption are sig-

nificantly different between advanced and developing countries. The real exchange rate depreciates significantly by 3 percent in advanced countries but it appreciates by over 4 percent in developing countries. Consumption increases with government spending in developing countries, but the effect of government spending on consumption is negative and statistically insignificant in developed countries. The current account deteriorates in both groups.

To facilitate our analysis, we compile an extensive dataset for both advanced and developing countries, combining data on international military spending, total government spending, along with several other important national account aggregates and macroeconomic indicators. Importantly, we gather information on war periods, political risks, financial crises, and commodity exporters to examine how these factors may affect our estimates. Covering many countries in the dataset naturally leads to the use of annual data. The resulting dataset consists of 125 countries in the period 1989–2013, with 96 developing countries in the sample.

Our identification of government spending shocks comes from the assumption that military spending is exogenous to the state of the economy. We implement this identification strategy using the local projections method, as in Jordà (2005). This methodology has been widely used in the literature on the effects of government spending shocks (e.g., Auerbach and Gorodnichenko 2012, Ramey and Zubairy 2014). Total government spending is instrumented by military spending. Hence, government spending shocks come from fluctuations in military spending that are not forecastable by the lags of output, government spending, and other controls.

Our empirical results pose a challenge for international business cycle models to explain both developing and advanced countries. In both standard neoclassical and New Keynesian models, a rise in government spending leads to an appreciation of the real exchange rate, which is consistent with our finding for developing countries but not for advanced economies. Several papers propose a solution to this exchange rate depreciation puzzle in advanced countries. For example, Ravn, Schmitt-Grohé, and Uribe (2012) add a deep habit mechanism, while Corsetti, Meier, and Müller (2012) introduce spending reversals into an otherwise standard model to generate a deprecation of the real exchange rate. However, the risk sharing condition in these models, which implies that consumption tends to decrease when the real exchange rate appreciates, does not square well with our empirical evidence in either developing or advanced countries. In other words, our empirical results are in line with the risk sharing puzzle documented in Backus and Smith (1993) and Kollmann (1995). We examine two models that can potentially explain our empirical evidence: (1) a model in which hours and consumption are complements, and (2) a model with limited asset market participation. These models have been used in the literature to explain the effects of government spending on the economy. Both extensions to a standard international business cycle framework can generate an increase in consumption when the real exchange rate appreciates, which is consistent with the results for developing countries but not for advanced countries.

Our paper is related to the literature on the effects of fiscal policy shocks on real exchange rates and the trade balance. A number of papers, such as Kim and Roubini (2008), Monacelli and Perotti (2010), and Ravn, Schmitt-Grohé, and Uribe (2012), examine the responses of the real exchange

rate, trade balance, or current account to government spending shocks. We differ from the existing papers in several dimensions. First, these papers often identify government spending shocks using either sign restrictions or the Blanchard and Perotti (2002) assumption that government spending shocks cannot respond to output within the same quarter. In contrast, we exploit the exogeneity of military spending. Auerbach and Gorodnichenko (2016) also use defense spending to examine the behavior of real exchange rates, but they focus on the United States, and use the variations in the daily announcements of defense spending. Second, most of these papers use a few OECD countries, whereas our sample, in addition, contains many developing countries. We note that there are two papers that use relatively large sets of countries: Ilzetzki, Mendoza, and Végh (2013) assemble the data for 20 advanced and 22 developing countries, but focus on output. Kim (2015) studies the effects of government spending on real exchange rates, but all of the 18 countries are developed. Our paper considers a much larger set of countries, distinguishing between advanced and developing ones, and, importantly, provides external validity to the literature on the effects of spending shocks on exchange rates using a different identification strategy. Our results for advanced countries are consistent with previous studies that document the "puzzling" fact that real exchange rates depreciate after a government spending shocks in some advanced countries. At the same time, with a large sample of developing countries, our paper suggests that the "depreciation puzzle" does not extend to developing countries.

This paper is also related to the literature examining the transmission mechanism of international business-cycle models. Unlike Ravn, Schmitt-Grohé, and Uribe (2012) and Enders, Müller, and Scholl (2011), we find that the movements of real exchange rates in developing countries are consistent with the predictions of a standard international business-cycle model. However, our empirical finding for the consumption response in these countries suggests that the main mechanism within these models—in particular, the risk-sharing condition—may not hold in the data.

The rest of the paper proceeds as follows. Section 2 discusses our identification strategy. We summarize our dataset in Section 3. The main empirical results are presented in Section 4, along with numerous robustness checks. We compare our results with previous literature in Section 5. Section 6 shows the challenge for theoretical models to explain our empirical results. Section 7 concludes.

2 Econometric Specification

There are two major strategies to identify government spending shocks. One is the Blanchard and Perotti (2002) identification, which relies on the assumption that government spending does not react to changes in output within the same quarter. While this identification can be sensible for quarterly data, it restricts the sample size; the number of countries with quarterly data is small. Therefore, in our paper, we use the other identification strategy, which presumes that changes in military spending can be treated as exogenous. This identification has been used in the closed economy literature that exploits U.S. data (Hall 2009, Barro and Redlick 2011, Ramey 2011), but

it remains underutilized in the international context.

There are two compelling reasons to use military spending changes to identify exogenous government spending shocks in international data. First, military spending data are available for many countries at an annual frequency, and there are numerous episodes of significant variation over time, which help to estimate the effects of government spending precisely. Second, changes in military spending can be treated as exogenous to business cycles in many countries. Examples of large, exogenous fluctuations of military spending that took place across a number of countries include the collapse of the Soviet Union, and consequently the end of the Cold War, as well as the allies' military operations in the Middle East such as the Gulf War or Afghanistan wars. There are also exogenous changes in military spending in developing countries. For example, at the end of the Gulf War, Bahrain increases its military spending in order to ensure the safety of its coastline. Accordingly, in our data, we observe a large increase in Bahrain's military spending in 1991–1992. Following the 2008 border disputes with Thailand, Cambodia increases its spending in 2009–2010. Colombia also adjusts military spending throughout the mid-1990s in order to defeat a guerilla movement and to combat drug trafficking in the country. Such examples of military spending that has little to do with the current or anticipated economic performance allow us to identify government spending shocks. In support of this argument, Collier (2006) studies the differences in military spending across developing countries and concludes that the history of domestic and international conflicts, arms races with neighboring states, and vested interests of the military, which are considered exogenous to the state of the economy, are the main determinants of such differences.[1]

We estimate the effects of government spending on the real exchange rate and other variables of interest using Jordà's (2005) local projections method. This method has a number of advantages over the vector autoregression (VAR). First, the local projections method does not constrain the shape of the impulse response function (IRF) in the way the VAR does. Given potential heterogeneity across countries in the level of development and institutions, it is important to impose as few restrictions as possible. Second, the local projections method is flexible, as the same variables do not have to be used in each equation. Third, this method allows us to account for cross-country correlations of residuals using straightforward inference. In the results section, we report standard errors clustered by country.

Specifically, we estimate the following equations:

$$\frac{x_{i,t+h}-x_{i,t-1}}{x_{i,t-1}} = c+\alpha_i+\beta_h \frac{\Delta g_{it}}{y_{i,t-1}} + \Phi^x(L)\ \frac{\Delta x_{i,t-1}}{x_{i,t-2}} + \Phi^g(L)\ \frac{\Delta g_{i,t-1}}{y_{i,t-2}} + \boldsymbol{\gamma}'\,\boldsymbol{z}_{it} + \varepsilon_{it} \text{ for } h=0,1,2,\ldots \tag{1}$$

where x_{it} is a variable of interest (e.g., the real exchange rate) in country i and year t, g_{it} is total government spending, y_{it} is output, $\boldsymbol{z}_{it}$ is a vector of controls, ε_{it} is the error term, α_i represents

[1] We note that there are certain cases when the exogeneity assumption may not hold. For example, wars associated with a large number of deaths and significant destruction of capital can lead simultaneously to a decline in output and an increase in government spending. Similarly, the oil exporters benefiting from an increase in oil prices can increase both output and spending. In our baseline specification, we control for a war dummy, and in Section 4.5, we show further that controlling for these special circumstances does not change our conclusions.

country fixed effects, and $\Phi^x(L)$ and $\Phi^g(L)$ are lag polynomials. We instrument $\Delta g_{it}/y_{i,t-1}$ with $\Delta g^{\mathrm{m}}_{it}/y_{i,t-1}$, where g^{m}_{it} is military expenditure, to address the endogeneity of g_{it}. In this specification, β_h measures the h-period ahead response of variable x to an increase in government spending of 1 percent of GDP. In the baseline specification, the vector of controls $\boldsymbol{z}_{it}$ includes a war index and one lag of the real GDP growth rate. The war index takes a value of 1 when country i has a conflict at time t. This war index controls for the fact that wars, on average, may have different effects on x. The lagged real GDP growth rate controls for the state of the economy. We note that Barro and Redlick (2011) advocate for using the unemployment rate lag to control for the state of the economy. In our case, controlling for lagged unemployment without lagged output growth, or in addition to lagged output growth, does not have a material effect on the results. To keep our specification parsimonious, we therefore do not include unemployment in our baseline estimation. In the robustness section, we augment the baseline with time fixed effects (δ_t) and other controls such as the unemployment rate (u_{it}).

3 Data

Our dataset includes government spending, military spending, real exchange rates, consumption, current accounts, a war index, and several other macroeconomic variables in 125 countries (29 advanced and 96 developing countries) between 1989 and 2013. To the best of our knowledge, this is the most comprehensive country coverage available up-to-date to analyze the effects of government spending. The military expenditure data are taken from Stockholm International Peace Research Institute (SIPRI). SIPRI collects military spending data from several sources, including government agencies and international organizations. The SIPRI military spending data include all spending on current military forces and activities such as personnel payment, procurement, operations, military research and development, and construction. The largest component of military spending is usually salaries and benefits of military personnel. The data are at an annual frequency.[2]

We obtained the real effective exchange rate data from the International Monetary Fund's *International Financial Statistics (IFS)* and Bruegel.[3] The data on the current account as a percentage of GDP come from the *World Economic Outlook (WEO)* database. The *WEO* reports data for 189 countries, and goes back to 1988 for most of the countries.[4]

The data on real GDP, total government expenditure, and private consumption come from the United Nations' *National Accounts Main Aggregates Database (NAMAD)*. Total government spending stands for general-government final consumption expenditure. Private consumption includes household consumption expenditure, as well as expenditures of nonprofit institutions that serve households. All variables are per capita and in 2005 constant national currency units. We note

[2] Sheremirov and Spirovska (2015) provide more details on this dataset.

[3] Bruegel is a European think-tank, which provides annual CPI-based real effective exchange rates (REERs) for 172 countries during the 1992–2014 period. This is the most comprehensive REER dataset available.

[4] Our dataset also includes the net exports–to-output ratio obtained from export and import data in the World Bank's *World Development Indicators (WDI)* The *WDI* database contains comprehensive series on the imports and exports of goods and services for over 195 countries covering our entire sample period.

Table 1. Descriptive Statistics

	Obs.	$\sigma\frac{\Delta g}{g}$	$\sigma\frac{\Delta g^m}{g^m}$	$\sigma\frac{\Delta REER}{REER}$	$\sigma\frac{\Delta c}{c}$	$\sigma\frac{TB}{y}$	$\sigma\left(\frac{\Delta g}{g}, \frac{\Delta g^m}{g^m}\right)$	$\frac{g^m}{g}$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Full sample	2,766	5.3	12.7	6.4	5.5	5.8	0.23	0.16
		(3.1)	(5.6)	(2.8)	(4.2)	(4.4)	(0.25)	(0.14)
Advanced	682	2.7	7.7	4.2	2.7	3.5	0.24	0.13
		(2.3)	(3.9)	(1.6)	(2.1)	(3.4)	(0.21)	(0.13)
Developing	2,084	6.1	14.2	7.1	6.4	6.5	0.23	0.17
		(2.9)	(5.2)	(2.7)	(4.3)	(4.5)	(0.26)	(0.14)
Fixed	1,266	5.1	12.5	4.5	4.9	5.9	0.23	0.17
		(3.3)	(6.5)	(2.2)	(4.0)	(5.1)	(0.43)	(0.16)
Flexible	1,500	5.2	13.3	7.7	5.8	5.2	0.23	0.15
		(3.5)	(8.2)	(3.3)	(4.8)	(3.6)	(0.36)	(0.12)

Notes: Column (1) shows the number of observations. Columns (2)–(6) summarize the average standard deviations (σ) of the growth rates of government spending ($\Delta g/g$), military spending ($\Delta g^m/g^m$), real effective exchange rates (ΔREER/REER), consumption ($\Delta c/c$), and of the trade balance–to-output ratio (TB/y). Column (7) shows the correlation of military-spending and government-spending growth rates, $\sigma(\Delta g/g,\ \Delta g^m/g^m)$. Column (8) reports the mean share of military spending (g^m) in total spending (g). The numbers in parentheses represent one standard deviation across countries.

that our dataset includes several other variables such as the unemployment rate, for which the data come from the *World Development Indicators (WDI)* dataset, or the debt-to-GDP ratio taken from the IMF's *Historical Public Debt* database.

Finally, our war index comes from the *UCDP/PRIO Armed Conflict Dataset*. Gleditsch et al. (2002) and Pettersson and Wallensteen (2015) provide more detail on how they classify wars. We note that another source of war index, the Correlates of War (CoW) project, covers the period only up to 2007; thus, we choose to use the UCDP/PRIO data to preserve sample coverage.[5] The data sources and collection are summarized in Table A1 of Appendix A.

Table 1 presents major data statistics. In total, we have 2,766 observations. We note that to obtain this final dataset, we dropped several countries such as Angola, Pakistan, Rwanda, and Sri Lanka, which go through extraordinary events for several years during the sample period. Besides, we also drop extreme observations by cutting a 1 percent tail on each side. We split the sample into two groups: advanced and developing countries. The classification is based on the World Bank (2000). We use this classification for two reasons: First, the year 2000 is approximately in the middle of our sample. Second, this classification was used by Ilzetzki, Mendoza, and Végh (2013), making our results comparable with the literature.[6] About three-fourth of the observations are of developing countries.

The data are well-suited to study the effects of government spending: The share of military spending in total government spending is sizeable. Military spending makes up about 13 percent of total government spending in advanced countries and 17 percent in developing countries. In both advanced and developing countries, military spending is, on average, two to three times more volatile than government spending, which helps us to precisely estimate the effects of government

[5] Bazzi and Blattman (2014) compare the UCDP/PRIO data with the CoW data. Besides the difference in period coverage, the UCDP/PRIO data contain more information on smaller conflicts, in particular, those with fewer than 1,000 deaths per year.

[6] Advanced countries are those in the high income group, while developing countries are in the middle- and low-income group.

spending. The volatility of military spending differs substantially across countries, as the standard deviation of the volatility is fairly large. As reported in column (7) of Table 1, there is a positive correlation of total government spending and military spending, which we utilize for the instrumental variable estimation. On average, across all countries in the sample, the correlation is 0.23. The average correlations of total government spending and military spending across advanced and developing countries are similar to each other. Our data exhibit several other important characteristics. For example, government spending is about as volatile as consumption. Real exchange rates are more volatile than consumption in both advanced and developing countries, a fact consistent with previous literature.

4 Empirical Results

This section presents the effects of changes in government spending on real exchange rates and current accounts, and compares the responses in advanced and developing countries. Since standard open economy models make sharp predictions about the comovement of the real exchange rate with the current account and consumption, we also estimate the responses of these variables to government spending shocks.

4.1 All Countries

We first present the estimated responses of the real exchange rate, current account, and consumption to an increase in government spending of 1 percent of GDP, using the full sample of 125 countries and the period between 1989 and 2013.[7] We note that government spending is persistent with a cumulative increase of about 1.2 percent of GDP at a one-year horizon, as plotted in the top left panel of Figure 1. Additionally, the F-statistic of the first stage is high, well above 10, suggesting that the relationship between government spending and military spending is strong.[8]

The top right panel of Figure 1 plots the effects of an increase in government spending of 1 percent of GDP on the REER in the baseline specification. The most important result in Figure 1 is that a positive shock to government spending leads to real exchange rate appreciation. The estimates are large and statistically significant. The response of the REER is hump-shaped and significant up to a two-year horizon. A positive government spending shock of 1 percent of GDP causes the real exchange rate to appreciate by 3.7 percent on impact, reaching its maximum of 7 percent over a one-year horizon. This result holds in several variations of Equation (1), for example, when we control for a lag of the unemployment rate.[9]

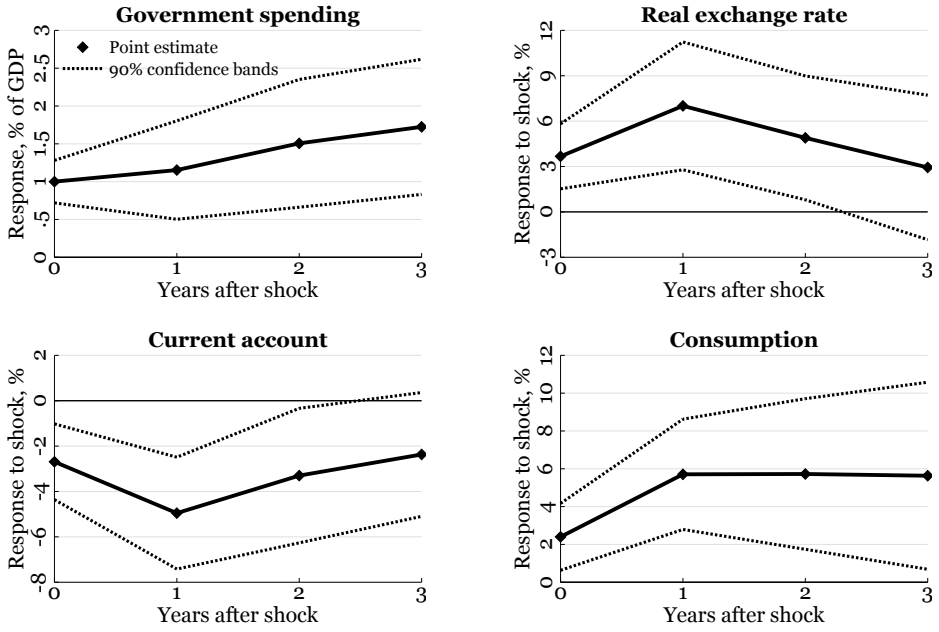
The bottom left plot in Figure 1 shows the response of the current account–to-GDP ratio. The current account deteriorates in response to an increase in government spending. Current account-

[7] Appendix B provides more detail on the composition of countries and sample periods.

[8] We also estimate the baseline specification using a limited information maximum likelihood (LIML) estimator. The results are similar.

[9] Table C1 in Appendix C reports the results of several other estimation specifications.

Figure 1. Responses to Government Spending Shocks: Full Sample



Notes: The responses of government spending, real exchange rate, current account, and consumption to an increase in government spending of 1 percent of GDP at horizons from 0 to 3 years. Government spending is instrumented by military spending. The short dashed lines are the 90 percent confidence interval bounds.

to-output decreases by 2 to 5 percentage points over a two-year horizon. The responses are statistically significant at horizons up to two years.[10]

The bottom right plot of Figure 1 shows the response of consumption to government spending shocks. An increase in government spending of 1 percent of GDP leads to an increase in consumption of 2 percent on impact and over 5 percent within two years.[11]

4.2 Advanced vs. Developing Countries

Next, we compare the responses of the real exchange rate, current account, and consumption in advanced and developing countries. We first estimate Equation (1) using the indicator function for each subsample. To test the difference between advanced and developing countries' responses, we estimate the following regression at each horizon $h = 0, 1, 2$:

$$\frac{x_{i,t+h} - x_{i,t-1}}{x_{i,t-1}} = I^A \times \left(c^A + \alpha_i^A + \beta_h^A \frac{\Delta g_{it}}{y_{i,t-1}} + \Phi^{x,A}(L) \frac{\Delta x_{i,t-1}}{x_{i,t-2}} + \Phi^{g,A}(L) \frac{\Delta g_{i,t-1}}{y_{i,t-2}} + \boldsymbol{\gamma}^{\boldsymbol{A}\prime} \boldsymbol{z}_{it} \right)$$
$$+ I^D \times \left(c^D + \alpha_i^D + \beta_h^D \frac{\Delta g_{it}}{y_{i,t-1}} + \Phi^{x,D}(L) \frac{\Delta x_{i,t-1}}{x_{i,t-2}} + \Phi^{g,D}(L) \frac{\Delta g_{i,t-1}}{y_{i,t-2}} + \boldsymbol{\gamma}^{\boldsymbol{D}\prime} \boldsymbol{z}_{it} \right) + \varepsilon_{it}, \quad (2)$$

[10] Similar to the REER case, we estimate several variations of the baseline specification, including the one with a lag of the unemployment rate. We find similar results, as detailed in appendix Table C2. We also find that the net exports–to-GDP ratio declines in response to an increase in government spending. The results are reported in appendix Table C3.

[11] When we estimate other variations of the baseline specification, all the results in appendix Table C4 suggest that after a positive government spending shock, consumption increases substantially in the full sample.

Table 2. Differences between Advanced and Developing Countries

Horizon	*Real Exchange Rate*		*Current Account*		*Consumption*	
	Difference	p-value	Difference	p-value	Difference	p-value
	(1)	(2)	(3)	(4)	(5)	(6)
On impact	−7.67	0.00	0.71	0.66	−5.57	0.10
1 year	−12.94	0.00	−1.40	0.75	−8.21	0.00
2 years	−12.95	0.01	−2.03	0.72	−7.71	0.05
3 years	−15.93	0.01	−1.51	0.72	−10.86	0.06

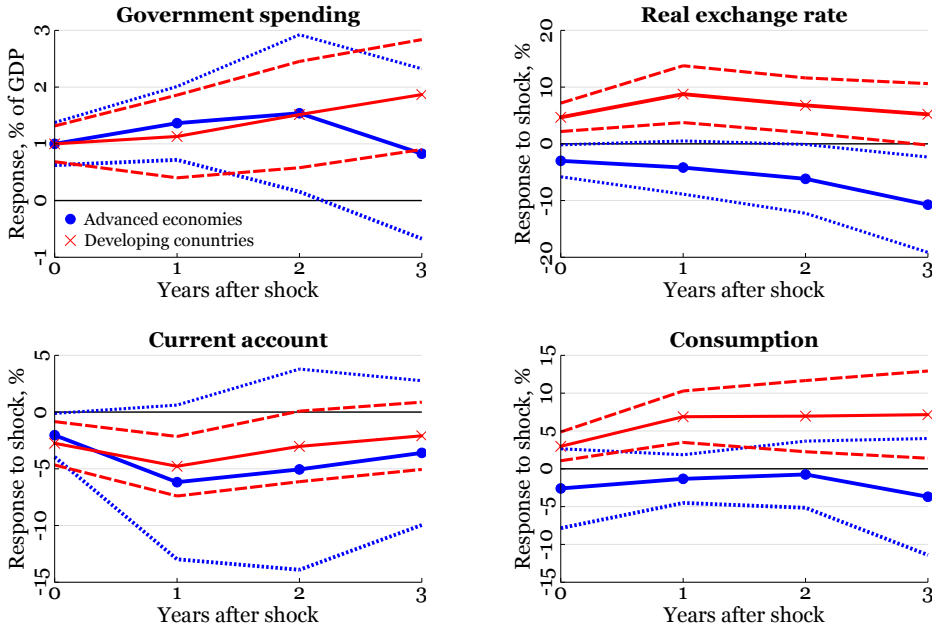
Notes: The differences are calculated by subtracting the responses in developing countries from those in advanced economies.

where I^A is the indicator for advanced countries and I^D is the indicator for developing countries. The difference between the estimates for advanced and developing countries is given by $\beta_h^A - \beta_h^D$.

First, the responses of real exchange rates in advanced and developing countries are substantially different from each other. As plotted in the top right panel of Figure 2, while in developing countries the REER appreciates, advanced countries' REER depreciates at all horizons up to three years.[12] The estimates for developing countries are statistically significant at horizons up to two years, while the estimates for advanced countries are statistically significant on impact and at a two-year horizon. On impact, the REER in advanced countries depreciates by about 3 percent after an increase in government spending of 1 percent of GDP. In contrast, the REER in developing countries appreciates by about 4.7 percent on impact. The depreciation in advanced countries is approximately of the same magnitude as the appreciation in developing countries within a two-year horizon. However, in advanced countries, the REER response peaks at longer horizons than in developing countries, reaching its maximum, in absolute terms, of a 10 percent depreciation rate over a three-year horizon. Our finding that the REER depreciates in advanced countries is consistent with the previous literature that focuses on OECD countries, such as Monacelli and Perotti (2010) and Ravn, Schmitt-Grohé, and Uribe (2012), but contradicts to a recent paper by Auerbach and Gorodnichenko (2016), who find the appreciation of the real exchange rate in response to an increase in military spending in the United States. However, the fact that our confidence intervals for advanced countries are relatively large suggests that there is a high degree of heterogeneity across advanced countries. Columns (1) and (2) of Table 2 report the differences between the responses of REERs in advanced and developing countries, as well as the corresponding p-values. The responses of REERs in advanced countries are significantly smaller than those in developing countries, highlighting a stark contrast between these two groups of countries. Finally, we note that the responses of government spending in both advanced and developing countries are similar to each other, as plotted in the top left panel of Figure 2. Government spending increases persistently in all countries by almost the same magnitude during the first two years, thus government spending processes may not explain the differences in the responses across the two groups of countries.

[12] As the set of developing countries in our study is fairly large, one may suspect significant heterogeneity within this category. To check this, we split developing countries into middle- and low-income groups, according to the World Bank (2000) classification. We do not find much support for heterogeneity. The estimates of REER responses for these two groups are similar to each other. Appendix Table C5 reports the estimates. Since the low-income countries coverage is relatively small, and real exchange rates appreciate in both low- and middle-income countries, we report the rest of the results for the two groups combined.

Figure 2. Advanced vs. Developing Countries



Notes: The responses of government spending, real exchange rates, current account, and consumption to an increase in government spending of 1 percent of GDP in two groups of countries. Government spending is instrumented by military spending. The navy short dashed lines and red long dashed lines are the 90 percent confidence interval bounds for advanced and developing countries, respectively.

The bottom left panel of Figure 2 shows that current accounts in both groups of countries decline substantially in response to the identified government spending shocks. In other words, both advanced and developing countries increase borrowing. The estimated response of the current account in advanced countries is less precise than that in developing countries, and its 90 percent confidence interval is wide. We also test formally the difference between the responses of the current account in advanced and developing countries. As reported in columns (3) and (4) of Table 2, the p-values of the differences exceed conventional values at all horizons, so we cannot reject the null hypothesis that there is no difference between the responses of the current accounts in advanced and developing countries.

The consumption responses in advanced countries are different from those in developing countries. As reported in the bottom right panel of Figure 2, in advanced countries, consumption declines in response to an increase in government spending of 1 percent of GDP. The decrease in consumption in advanced countries is large, about 3 percent, corresponding to a multiplier of -1 on impact. The point estimate for advanced countries is different from that in previous papers such as Monacelli and Perotti (2010), who document an increase in consumption in a smaller number of countries. However, we note that the confidence bands of the advanced-countries estimates are wide and include zero, so it is difficult to draw a sharp conclusion about the responses of consumption in advanced countries. On the other hand, consumption increases significantly in developing countries. We report the differences in consumption responses in advanced and developing countries, as well as the p-values, in columns (5) and (6) of Table 2. We can marginally reject the hypothesis that there is

no difference between the consumption responses in the two groups of countries on impact (the p-value is 0.1). At horizons from one to three years, the differences in consumption responses in advanced and developing countries are statistically significant.[13]

4.3 Exchange Rate Regimes

Since the effects of government spending can depend in theory on exchange rate regimes, we estimate our baseline specification by grouping countries based on their exchange rate regime. We use the Klein and Shambaugh (2008) classification to categorize exchange rate regimes. We find that the responses of the real exchange rate, the current account, and consumption depend on an exchange rate regime.

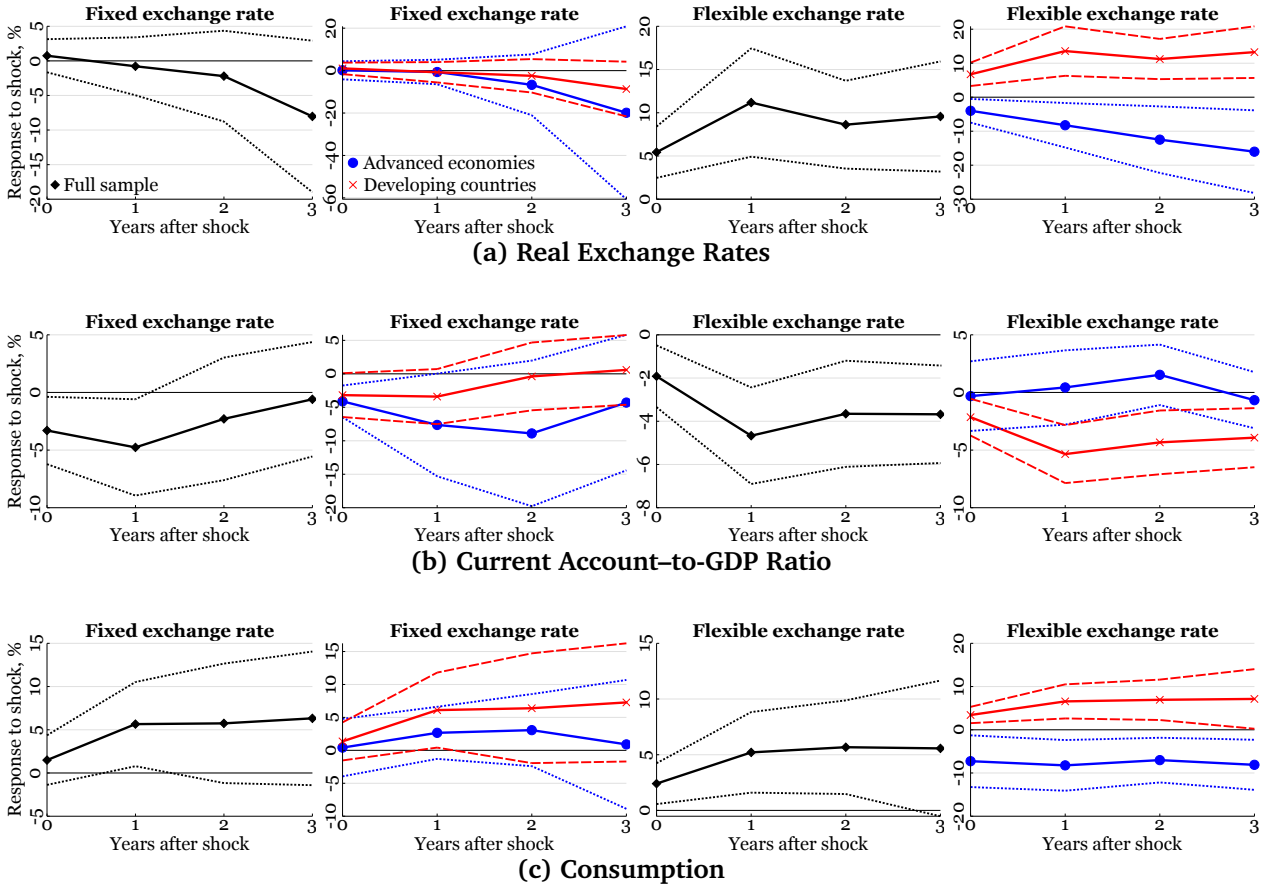
Figure 3a shows estimates of the REER response separately for countries with fixed and flexible exchange rate regimes. Under a fixed exchange rate, the REER response is not significantly different from zero. The same is true when we look at advanced and developing countries with a fixed exchange rate regime: the responses of the REER in both groups are close to zero or negative, but insignificant at all considered horizons. Under a flexible exchange rate regime, the REER response to an expansionary government spending shock is positive, similar to the baseline response. We also find that advanced countries experience a significant depreciation of real exchange rates, whereas the reverse is true for developing countries. These results suggest that the estimates of the REER response are driven by countries with a flexible exchange rate regime.

Figure 3b displays the effects of government spending shocks on the current account–to-output ratio under different exchange rate regimes. For countries with a fixed exchange rate regime, the current account deteriorates in response to a positive government spending shock in both the advanced and developing countries subsamples, although the responses of the current account have wide confidence intervals. In the flexible exchange rate regime, the current account deterioration is statistically significant in the full subsample, but this result is mostly driven by the developing countries. In advanced countries with a flexible exchange rate regime, the responses of the current account are small and positive, but not significantly different from zero at all considered horizons.

Finally, the effects of government spending changes on consumption also depend on the exchange rate regime. As plotted in Figure 3c, point estimates of the responses of consumption are positive for both advanced and developing countries under a fixed exchange rate regime. However, the responses are not significantly different from zero. On the other hand, the responses of consumption are similar to the baseline results when we restrict our attention to countries with a flexible exchange rate regime only. In particular, consumption rises, on average. However, consumption increases only in developing countries, while it decreases in advanced countries under

[13] We estimate the responses of other important variables—inflation, government debt, and tax rates—to inspect the transmission mechanism of government spending shocks. However, since for most of the variables the results have wide confidence intervals, we leave them in appendix Table C6. In particular, inflation declines in response to a government spending shock, although the decline is not statistically significant. Government debt responds significantly only in developing countries, and only on impact. In such cases, government debt falls. When we look at the response of tax rates separately, we find significantly positive responses only occasionally. However, the sample size of our data on tax rates is significantly smaller than the size of the baseline sample.

Figure 3. Fixed and Flexible Exchange Rate Regimes



Notes: The responses of the real exchange rate, current account, and consumption to an increase in government spending of 1 percent of GDP, by exchange rate regimes. The dashed lines are the 90 percent confidence interval bounds.

a flexible exchange rate regime. This result, together with the results on the real exchange rate, suggests that our baseline results are disproportionately influenced by countries with a flexible exchange rate regime.[14]

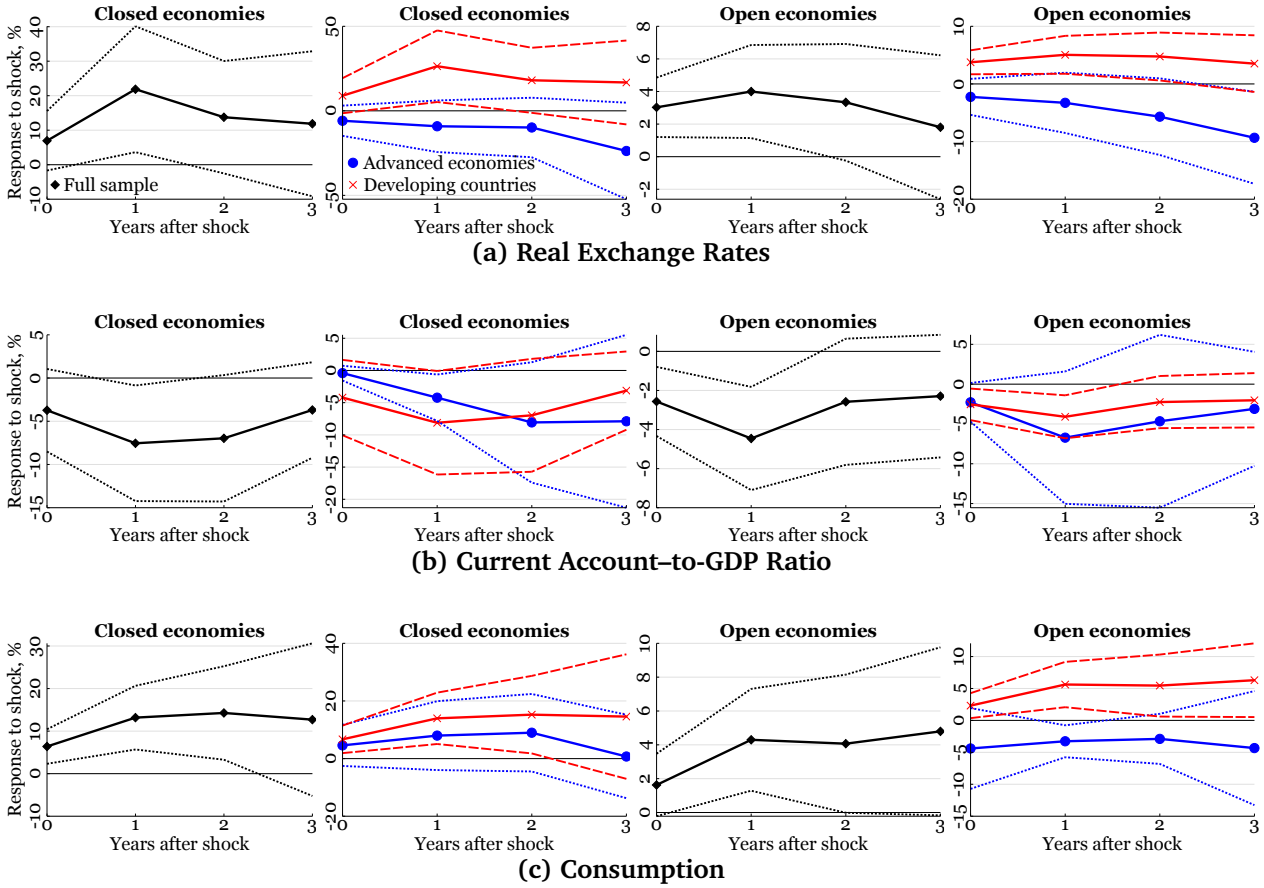
4.4 Openness to Trade

To examine whether the level of openness to trade affects the response of real exchange rates and current accounts to government spending shocks, we re-estimate the baseline specification using subgroups of countries based on the combined shares of exports and imports in GDP. Following Ilzetzki, Mendoza, and Végh (2013), we calculate the average trade share in GDP for each country over the entire sample period. If the average trade share is above 60 percent of GDP, the country is classified as open.[15] Figure 4 displays the responses of the real exchange rate, current account–to-

[14] We note that the sizes of the samples of advanced countries under a fixed exchange rate regime and of those under a flexible exchange rate regime are similar to each other. The detailed results including the sample sizes and the F-statistics of the corresponding first stage regressions are tabulated in appendix Table C7.

[15] The results in this section do not change if we choose the classification based on the trade share at the midpoint of the sample period.

Figure 4. Openness to Trade



Notes: The responses of the real exchange rate, current account, and consumption to an increase in government spending of 1 percent of GDP, based on the level of openness measured by the total trade share in GDP. The dashed lines are the 90 percent confidence interval bounds.

output ratio, and consumption for different groups of countries.[16] The responses of real exchange rates are similar in open and closed economies. On average, the real exchange rate appreciates, which is similar to the baseline results. Real exchange rates appreciate in developing countries and depreciate in advanced countries, regardless of whether the country is open or closed. In Figure 4b, the current account deteriorates in both open and closed economies regardless of the level of trade openness. Finally, although consumption increases in both closed and open economies, on average, closed advanced countries increase their consumption in response to an expansionary government spending shock, whereas open advanced countries decrease their consumption, as shown in Figure 4c. Nevertheless, the estimates for advanced countries are less precise, with wide confidence intervals. These results suggest that in the context of our dataset, openness to trade may not matter much for the transmission mechanism of government spending shocks.

Our results differ somewhat from the previous literature. Ilzetzki, Mendoza, and Végh (2013) report that that fiscal multipliers are larger in closed economies than in open economies. However,

[16] Appendix Table C8 presents numerical estimates, along with sample sizes and first-stage F-statistics.

they do not consider the responses of the current account and the real exchange rate based on openness. Kim (2015) documents that the magnitude of the current account response is larger in open economies than in closed economies; however, in his paper, current accounts rise (not fall as in this paper and in Ilzetzki, Mendoza, and Végh 2013) in response to a government spending increase. In contrast, our results do not lend support to differential responses of current accounts or consumption based on trade openness. At the same time, we are in line with Kim (2015) on the similarity of REER responses in open and closed economies.

4.5 Robustness Checks

This section examines important cases that can affect our baseline results. In particular, we analyze whether wars, financial crises, commodity prices, and the type of military spending can significantly influence our baseline results. We also show that our results are robust to adding potentially important controls to the regression.

Wars Our identification relies on the fact that changes in military spending, especially those related to wars far from domestic soil, can be considered exogenous. However, this identification strategy may not work for wars associated with major human and capital losses. Although we drop from our baseline sample several countries with a long history of civil wars, such as Angola, Pakistan, Rwanda, and Sri Lanka, and then control for the average effects of wars, it is still possible that the baseline results are driven by special war periods in other countries in the sample. To address this possibility, we estimate Equation (1) excluding all wars observations. Since the UCDP/PRIO war index includes both large conflicts, with more than 1,000 deaths a year, and small conflicts, with less than 1,000 deaths a year, and the index also captures civil wars as well as international border disputes, our exclusion of all war periods is conservative.[17] The first three columns of Table 3 present the results for real exchange rates, current accounts and consumption in this restricted sample. In general, the baseline results are robust. We find that while real exchange rates appreciate in developing countries at all considered horizons, the evidence from advanced countries is not conclusive, as the point estimates are not significant at conventional levels. Current accounts deteriorate in both groups of countries, and the estimates are statistically significant up to a one-year horizon. Consumption in developing countries increases significantly, in contrast to the negative and insignificant response in advanced countries.[18]

Financial Crises Financial crises episodes may also affect the exogeneity of military spending. Since our large dataset includes several financial crisis episodes, we examine whether excluding these observations affects our results. The crisis dates are taken from Reinhart and Rogoff

[17] We note that the majority of wars in the dataset are civil wars. There are few international border disputes (three observations), and since small disputes can lead to exogenous changes in military spending, we only exclude international border disputes with more than 1,000 deaths a year.

[18] In another robustness check, we exclude from our sample all countries with at least 10 years of civil war. These countries are Algeria, Burundi, Chad, Colombia, Ethiopia, India, Indonesia, Iran, Israel, Nepal, Peru, the Philippines, Russia, Thailand, Turkey, Uganda. The results are similar to the baseline, as shown in appendix Table C9.

Table 3. Results Sensitivity to Sample Construction

	No War			No Crises			No Commodity			No Armed Imports		
	All	Adv	Dev	All	Adv	Dev	All	Adv	Dev	All	Adv	Dev
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10	(11)	(12)
Panel A: Real Exchange Rates												
On impact	4.16***	−2.95	5.05***	0.77	−10.27	4.00	1.21	−5.63***	2.55	5.54***	−3.18	6.38***
	(1.46)	(2.27)	(1.68)	(3.82)	(8.26)	(4.85)	(1.37)	(1.84)	(1.59)	(1.73)	(3.34)	(1.93)
1 year	5.93**	−3.88	7.24**	3.11	−6.34	6.63	4.32*	−8.42**	6.66**	11.54**	−3.55	12.98***
	(2.42)	(3.73)	(2.84)	(4.92)	(9.02)	(6.20)	(2.53)	(2.97)	(3.08)	(4.01)	(5.47)	(4.47)
2 years	4.89*	−5.10	6.30*	−3.50	−11.21	0.43	3.47	−11.45***	6.22*	8.87**	−4.76	10.31**
	(2.82)	(4.61)	(3.30)	(5.70)	(12.17)	(6.58)	(2.99)	(3.84)	(3.59)	(3.55)	(6.81)	(4.02)
3 years	3.44	−9.64	5.14	−6.64	−19.88	−1.12	2.25	−19.46**	6.17	4.79	−9.85	6.10
	(3.36)	(6.82)	(3.78)	(7.54)	(17.22)	(8.61)	(3.89)	(6.79)	(4.57)	(3.87)	(11.50)	(4.09)
First-stage *F*	25.4	17.9	20.3	23.6	4.5	17.8	18.4	27.5	13.3	16.5	13.1	13.9
Obs.	2,058	619	1,439	569	259	310	1,692	565	1,127	1,911	450	1,461
Panel B: Current Account–to-GDP Ratio												
On impact	−2.93***	−2.68**	−2.90**	−4.76**	−5.57	−4.67*	−1.51*	−0.76	−1.64*	−3.34**	−3.50***	−3.30**
	(1.06)	(1.37)	(1.18)	(2.12)	(4.71)	(2.46)	(0.79)	(1.12)	(0.90)	(1.49)	(1.27)	(1.61)
1 year	−4.90**	−8.44*	−4.41**	−9.71**	−11.26*	−9.40*	−3.20*	−0.50	−3.75**	−7.37**	−9.54	−7.01***
	(1.58)	(4.92)	(1.60)	(4.24)	(6.63)	(5.19)	(1.64)	(1.46)	(1.90)	(2.11)	(7.78)	(2.10)
2 years	−2.81	−7.15	−2.20	−9.11**	−6.47	−9.89**	−2.82*	0.31	−3.42*	−5.68*	−9.37	−5.04*
	(1.85)	(6.84)	(1.82)	(3.59)	(6.71)	(4.18)	(1.61)	(2.68)	(1.83)	(2.95)	(10.02)	(2.91)
3 years	−1.71	−5.56	−1.14	−6.43**	−3.60	−7.31**	−2.08	−0.58	−2.19	−4.24*	−8.01	−3.54
	(1.67)	(5.18)	(1.72)	(2.57)	(5.18)	(2.85)	(1.87)	(2.29)	(2.10)	(2.49)	(7.49)	(2.47)
First-stage *F*	28.8	38.0	23.0	29.8	4.4	24.9	21.1	29.0	15.5	17.7	38.7	14.8
Obs.	2,090	605	1,485	583	259	324	1,720	553	1,167	1,953	442	1,511
Panel C: Consumption												
On impact	2.72**	−2.52	3.21**	3.36	1.42	3.93	3.00**	−4.27	4.02**	2.59*	−6.86***	3.45**
	(1.21)	(4.55)	(1.27)	(2.09)	(1.83)	(2.75)	(1.45)	(3.00)	(1.67)	(1.43)	(2.51)	(1.56)
1 year	5.69**	−0.31	6.66**	2.67	6.30**	1.96	6.23**	−1.85	7.30**	8.00**	−1.96	9.05***
	(1.99)	(2.34)	(2.31)	(2.76)	(2.93)	(3.40)	(2.29)	(3.56)	(2.65)	(2.82)	(2.35)	(3.13)
2 years	6.34**	0.71	7.41**	3.70	7.03*	3.04	5.63**	−2.03	6.63**	8.01**	−4.53*	9.53**
	(2.80)	(3.16)	(3.27)	(3.83)	(3.92)	(4.72)	(2.64)	(4.86)	(3.02)	(4.08)	(2.63)	(4.62)
3 years	7.08**	−3.10	8.58**	2.99	−0.39	4.17	3.02	−7.16*	4.33	9.04*	−15.20**	11.17**
	(3.43)	(6.49)	(3.94)	(4.36)	(4.25)	(5.47)	(3.36)	(4.18)	(3.88)	(4.98)	(4.50)	(5.55)
First-stage *F*	26.2	18.9	21.1	23.2	4.7	17.3	22.1	11.6	16.5	18.8	24.8	16.3
Obs.	2,122	620	1,502	580	259	321	1,757	565	1,192	1,995	453	1,542

Notes: This table reports the response of the real exchange rate, current account–to-GDP ratio, and consumption to an expansionary g shock of 1 percent of GDP. "Adv" denotes the advanced countries sample, "Dev" denotes the developing countries sample. The g shocks are constructed using military spending as an instrument for total government spending. In the first three columns, we drop countries at war from the sample. In the next three columns, we do the same for financial crises periods. Results in columns (7) to (9) are based on the exclusion of commodity exporters. Finally, the last three columns present results for the case when countries with a large share of military spending on armed imports are excluded.

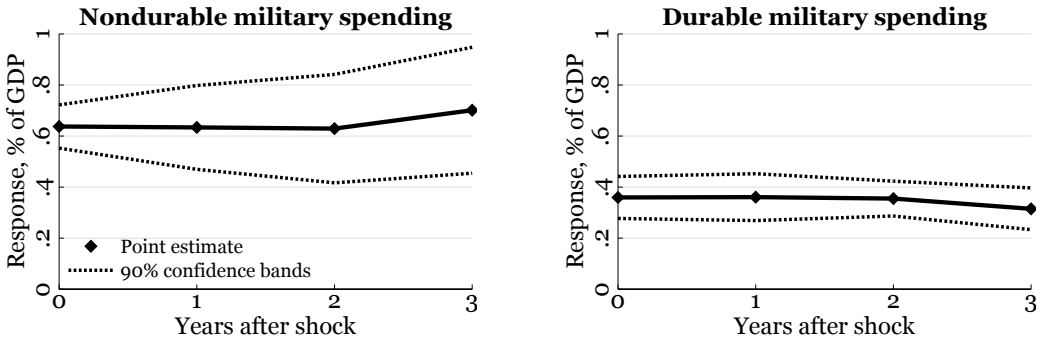
(2011). Similar to the war exercise, we exclude all observations that correspond to (*i*) banking crises (e.g., China, 1996–99), (*ii*) currency crashes (South Africa, 2000–01), (*iii*) sovereign domestic (Argentina, 1989–90) or external (Paraguay, 2003–04) defaults/restructuring , (*iv*) inflation crises (Russia, 2001), and (*v*) stock market crashes (United States, 2000–01). The results are presented in columns (4)–(6) of Table 3. Most of the baseline results carry through. For example, current accounts decrease in all countries. The real exchange rate appreciates in developing countries, although the estimates are less precise, possibly due to a much smaller number of observations. One difference from the baseline result is that consumption increases significantly in advanced countries at one- and two-year horizons, whereas consumption decreases insignificantly in the baseline. This result suggests that there might be a large degree of heterogeneity across advanced countries. Since the number of observations falls tremendously when we drop the observations with financial crises, we also examine a case when we control for the effects of financial crises by adding a dummy variable to the baseline specification. The results of this case, reported in appendix Table C10, are in line with the baseline estimates.

Commodity Exporters Another concern about our dataset is that many countries are major commodity exporters, whose public budgets and military spending may depend on commodity prices. For example, Chile's Copper Law mandates that 10 percent of the country's export revenues from copper be spent on the military. As a result, higher copper prices may lead to an increase in military spending that coincides with real exchange rate appreciation, the strengthening of the current account, and an increase in consumption. We, therefore, exclude from our sample countries where the median share of commodities in total exports is above 50 percent.[19] In total, we exclude 38 countries. These countries are major exporters of oil (e.g., Nigeria, Russia, Saudi Arabia, United Arab Emirates, Venezuela), metals (Chile, copper), food (Burundi, coffee beans; Paraguay, soy beans), and other commodities (Burkina Faso, cotton). The results are presented in columns (7) to (9) of Table 3, and are mostly in concordance with the benchmark. This exclusion restriction is conservative. When we use a stronger exclusion criterion of having the share of exported oil and metals above 15 percent of GDP, the results are even closer to the baseline (Table C12 in the appendix).

Military Imports We also explore the role of military imports in the transmission mechanism of fiscal policy. Standard macroeconomic models give robust predictions about the exchange-rate effects of an increase in government spending directed to *domestic* products. This exercise is consistent with the common practice of spending public money on domestic infrastructure, health care, education, and so on. The military budgets of many countries, however, have a significant component of spending directed to foreign goods, since relatively few countries produce arms and military

[19] To measure the commodities share in total exports, we use two data sources: (1) the U.N. Conference on Trade and Development (UNCTAD), and (2) Comtrade database. Despite some differences between the two datasets, the resulting list of commodity exporters are almost identical. In two cases, the share is above 50 percent in Comtrade but not in UNCTAD (Indonesia, Nicaragua), and in one case, the opposite is true (the United Arab Emirates). To be conservative, these three countries are among the excluded 38 countries. The full list of excluded commodity exporters can be found in appendix Table C11.

Figure 5. Responses to Military Spending Shocks: Durable and Nondurable Military Spending



Notes: The responses of durable and nondurable military spending to an increase in military spending of 1 percent of GDP. The short dashed lines are the 90 percent confidence interval bound.

equipment themselves. In theory, when the government demands more foreign goods than domestic goods, the relative price of foreign goods to domestic goods increases, so the real exchange rate depreciates. The reverse is true if the government demands more domestic goods.

To understand whether such alternative mechanisms can explain our results, we merge our dataset with the U.S. Department of State's *World Military Expenditures and Arms Transfers (WMEAT) 2015* data. The WMEAT data contain detailed information about military expenditures and imports during the period 2002–2012. We construct countries' individual series of the share of imports in military spending by dividing imported arms deliveries by total military expenditures. We find that in most countries, the average share of arms imports in military spending is 18 percent or less. However, there are a handful of countries with a large share of armed imports in military spending (e.g., Egypt, over 50 percent), and therefore these extreme observations may have a disproportionate influence on our baseline results.[20] To address this problem, in columns (10) to (12), we exclude all countries with an averaged over-time fraction of more than 25 percent.[21] The results of this exercise confirm our baseline findings.

As another check, we investigate what components of military spending contribute to the shocks. The SIPRI data allow grouping military spending into four categories: equipment, infrastructure, personnel, and operational expenses. It is customary to treat the first two categories as consumption of durables, and the last two as nondurables. In our context, spending on nondurables is much more likely to have an effect domestically than spending on durables, which may be directed largely abroad. We then estimate the responses of these two components to an increase in military spending.[22] The results plotted in Figure 5 suggest that not only durable but also nondurable military spending increases; thus, it is unlikely that military imports drive the results.

[20] Figure C2 in the appendix plots the distribution of the average shares of armed imports in military spending in the full sample.

[21] These countries are Bahrain, Canada, Cape Verde, Egypt, Georgia, Guyana, Israel, Jordan, Laos, Luxembourg, Mexico, the Seychelles, Singapore, and the United Arab Emirates. The results are the same if we set the threshold at 40 percent, if we use the median share, or we drop countries with at least one annual share above 70 percent (appendix Table C13). These thresholds also cut off the countries where arm deliveries in one year exceed 100 percent of military spending.

[22] Essentially, this strategy produces a decomposition of the military spending shock into durable and nondurable components.

International Aid In many developing countries, government spending is funded to some extent by foreign aid. Aid-financed government spending may lead to effects different from tax- or debt-financed government spending. For example, the wealth effect may be negligible in this case, since government spending due to aid does not lead to higher taxes in the present or in the future, nor does it affect consumers' expectations. To address this issue, we test the sensitivity of our results to dropping from the baseline sample countries that receive a significant amount of aid. As the data on bilateral aid is not available for a large number of countries, we drop countries that receive substantial aid from World Bank development projects. Using internal World Bank data, Kraay (2012) identifies 29 countries that received substantial aid in the period 1985–2009, which roughly matches our sample period. Table C14 in the appendix presents the estimates of our baseline equation when we drop 21 of such countries that are also present in our sample.[23]

Anticipated Spending One potential concern about our methodology is that we do not explicitly control for anticipated changes in military spending, which can have different effects on the economy compared to unanticipated changes. Since our sample consists of over a hundred countries, obtaining a forecast measure of military spending is difficult. However, we attempt to control for anticipated changes in military spending by adding a measure of political risks to the control variables. We use the political risk index from *The International Country Risk Guide*, which has published monthly data for over 140 countries since 1980. The index rates a country in a given period based on the assessment of external and internal risks, as well as of the military influence in the government. A higher risk rating may indicate that people expect military spending to change in the future. We include this index in the control set and re-estimate Equation (1). The first three columns of Table 4 suggest that our results are robust to adding this control variable.

Monetary Policy and Common Shocks Our next robustness exercises pertain to the roles monetary policy, interest rates, and common shocks play in fiscal transmission. First, since monetary policy can affect the transmission mechanism of government spending shocks, we add a policy rate to our baseline specification, and re-estimate the effects of government spending on the real exchange rate, current account, and consumption. Columns (4)–(6) of Table 4 present the results. Quantitatively, the baseline results stand, although the confidence intervals become wider. Second, to address the possibility that there are common shocks affecting the world economy, we include time fixed-effects in the control variables and re-estimate Equation (1). The results in the last three columns of Table 4 are similar to the baseline results. Third, since the 2008 Global Financial Crisis (GFC), nominal interest rates have remained at, or close to, zero in many countries. Naturally, there is a concern that the responses of the REER, consumption, and the current account to government spending shocks could change around 2008. To address this possibility, we produce estimates

[23]The excluded countries are Bolivia, Burkina Faso, Burundi, Cape Verde, Chad, Côte d'Ivoire, Ethiopia, Ghana, Jordan, Kenya, Lesotho, Madagascar, Malawi, Mali, Morocco, Senegal, Sierra Leone, Tanzania, Tunisia, Uganda, and Zambia. Foreign aid recipients that are not in our sample include Benin, the Central African Republic, the Comoros, Gambia, Guinea, Niger, Rwanda, and Togo.

Table 4. Results Sensitivity to Additional Controls

	Control for Political Rate			Control for Policy Rate			Time Fixed Effects		
	All	Adv	Dev	All	Adv	Dev	All	Adv	Dev
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: Real Exchange Rates									
On impact	3.63**	−2.97*	4.98***	3.50	−5.36**	6.06	3.77***	−2.08	5.04***
	(1.49)	(1.72)	(1.80)	(2.85)	(2.08)	(3.90)	(1.36)	(2.50)	(1.64)
1 year	6.73**	−3.89	8.94**	3.90	−9.01**	7.51*	7.17**	−4.07	9.54***
	(2.76)	(2.82)	(3.36)	(2.97)	(3.37)	(3.93)	(2.75)	(4.22)	(3.37)
2 years	3.84	−5.72	6.03**	1.92	−13.41***	6.68	5.50**	−8.00	8.35**
	(2.54)	(3.63)	(2.99)	(3.80)	(4.74)	(4.67)	(2.68)	(6.07)	(3.36)
3 years	1.70	−10.25**	4.20	0.19	−22.80**	6.49	3.21	−11.01	5.86
	(2.89)	(5.04)	(3.19)	(4.52)	(8.75)	(5.10)	(3.11)	(7.73)	(3.80)
First-stage F	24.5	19.3	17.7	7.5	44.1	4.7	28.3	15.1	20.7
Obs.	2,038	635	1,403	1,475	579	896	2,354	643	1,711
Panel B: Current Account–to-GDP ratio									
On impact	−2.94**	−2.21*	−3.03**	−4.60**	−2.12	−5.26*	−2.92***	−2.32	−3.01**
	(1.25)	(1.15)	(1.50)	(2.30)	(1.65)	(2.97)	(1.03)	(1.58)	(1.19)
1 year	−5.16**	−6.37	−4.89**	−4.33	−2.07	−5.28	−5.02**	−7.57	−4.79***
	(1.84)	(4.02)	(2.02)	(2.96)	(2.20)	(3.92)	(1.52)	(4.97)	(1.61)
2 years	−3.18	−5.23	−2.68	−3.51	−0.68	−4.59	−3.46*	−6.01	−3.25*
	(2.29)	(5.28)	(2.46)	(3.22)	(3.35)	(4.37)	(1.87)	(6.44)	(1.92)
3 years	−1.16	−3.94	−0.44	−2.37	−1.24	−2.35	−2.46	−4.49	−2.07
	(1.80)	(3.85)	(1.95)	(3.06)	(2.88)	(3.77)	(1.73)	(4.52)	(1.84)
First-stage F	25.8	33.0	18.4	8.4	48.7	5.3	29.5	25.8	21.6
Obs.	2,099	621	1,478	1,492	573	919	2,408	629	1,779
Panel C: Consumption									
On impact	3.69**	−2.41	4.69***	4.61*	−4.98	6.63**	2.99***	−2.73	3.62***
	(1.44)	(3.17)	(1.65)	(2.42)	(3.48)	(3.23)	(1.13)	(3.73)	(1.26)
1 year	7.90**	−1.21	9.97**	7.17*	−1.76	9.21*	6.29**	−0.81	7.19***
	(2.43)	(1.91)	(3.06)	(3.96)	(4.10)	(5.29)	(1.81)	(2.50)	(2.11)
2 years	8.38**	−0.57	10.68**	9.95	−1.42	12.76	6.37**	−0.30	7.23**
	(3.41)	(2.65)	(4.42)	(6.41)	(5.54)	(8.94)	(2.49)	(3.22)	(2.87)
3 years	7.52*	−3.21	9.92**	8.94	−7.01	12.62	6.44**	−2.36	7.21**
	(3.96)	(4.54)	(4.95)	(7.59)	(4.58)	(10.37)	(3.00)	(5.12)	(3.37)
First-stage F	24.6	21.0	18.0	7.7	20.3	5.1	30.6	16.8	23.2
Obs.	2,118	636	1,482	1,510	579	931	2,447	644	1,803

Notes: This table reports the response of the real exchange rate, current account–to-GDP ratio, and consumption to an expansionary g shock of 1 percent of GDP. "Adv" denotes the advanced countries sample, "Dev" denotes the developing countries sample. The g shocks are constructed using military spending as an instrument for total government spending. In the first three columns, we add the nominal policy rate to control for the monetary policy stance. In the next three columns, we control for political risks rating in each country. In the last three columns, we control for time fixed effects.

of the responses in the period 1989–2007, excluding the GFC and its aftermath. Table C15 in the appendix shows that our results for the REER, consumption, and the current account are not affected by the recent episode of the Great Recession and the zero lower bound. The estimates are statistically significant and quantitatively similar to the baseline.

5 Comparison with Previous Literature

We compare our results with Ilzetzki, Mendoza, and Végh (2013) and Kim (2015), two studies that examine relatively large panels of countries. Although Ilzetzki, Mendoza, and Végh (2013) focus primarily on the size of fiscal multipliers, their empirical strategy employs a VAR in four variables

Table 5. Comparison with Ilzetzki, Mendoza, and Végh (2013) and Kim (2015)

	IMV sample			Kim sample
	All	Adv	Dev	All
	(1)	(2)	(3)	(4)
On impact	2.65	−9.46*	6.52	−5.00
	(3.19)	(5.39)	(4.19)	(4.73)
1 year	−0.57	−13.79*	3.38	−4.92
	(4.43)	(7.57)	(5.67)	(7.58)
2 years	−6.97	−23.15*	−2.08	−14.66
	(6.33)	(11.88)	(8.34)	(10.53)
3 years	−6.83	−30.48**	1.24	−19.40
	(7.09)	(14.98)	(8.33)	(14.71)
First-stage F	17.0	4.4	9.8	21.4
Obs.	551	262	289	278

Notes: This table reports the response of the REER to an increase in the g shock of 1 percent of GDP in the restricted samples of Ilzetzki, Mendoza, and Végh (2013) and Kim (2015). "Adv" denotes the advanced countries sample, "Dev" denotes the developing countries sample. The g shocks are constructed using military spending as an instrument for total government spending.

(g, y, REER, and CA), which generates the response of the REER to government spending shocks, reported in the paper as well. Their results are somewhat inconclusive due to wide confidence intervals, and if anything, they support REER depreciation over long horizons. To make sure that the difference between our results and theirs is not due to country coverage, columns (1) to (3) in Table 5 report the estimates of the REER response for the case when our methodology is applied to the sample that matches theirs as close as possible.[24] We find that real exchange rates depreciate in advanced economies, consistent with both our baseline results and theirs. The difference is that our procedure applied to developing countries sample implies real exchange rate appreciation at most horizons. Yet, the estimates have wide confidence bands.

We also estimate our baseline specification in the sample that matches the 18 countries analyzed in Kim (2015).[25] Kim (2015) also identifies government spending shocks using government consumption data and the Blanchard and Perotti (2002) strategy, and finds that real exchange rates depreciate and the current account improves over time. We report the estimated responses of real exchange rates using Kim's sample and our identification strategy in column (4) of Table 5. Consistent with his paper, we find that real exchange rates depreciate. The main difference with his paper is that the current account deteriorates in our case.

To summarize, we find some differences between the results in this paper and in the two previous studies even when we control for sample composition. Therefore, we conclude that sample composition is unlikely to drive these differences. Furthermore, the wide confidence bands found in the case when we restrict the sample to be similar to the previous studies' suggest that it is important to pool the information from many countries, as we do in this paper.

[24] We match their sample fairly well. We have military spending data for all countries in their study, except Iceland. The only caveat is that our sample period for Australia, Canada, France, the United Kingdom, and the United States starts at 1989, while theirs goes back to the 1960s, except France (1976). For the other 38 (out of 44) countries, we have the same coverage. We also exclude observations after 2008 to match their sample period.

[25] Kim's sample includes only advanced countries and is a subset of Ilzetzki, Mendoza, and Végh (2013) in the period from 1981 to 2010. We match his sample fairly well, again except for Australia, Canada, France, the United Kingdom, and the United States.

6 Empirical Facts vs. Theory

This section discusses the challenges for international business cycle models to explain our empirical evidence in both advanced and developing countries. We first compare the empirical findings with the predictions of standard international business cycle models, which have been widely used in the literature such as Backus, Kehoe, and Kydland (1992), Chari, Kehoe, and McGrattan (2002), Galí and Monacelli (2005), and Steinsson (2008), among others. The basic structure of the model features two countries, Home (H) and Foreign (F), and two goods that each country specializes in. Consumer preferences have a home bias. The asset markets are complete.[26] The model implies the following relationship between consumption and the real exchange rate:

$$\frac{U_c^H}{U_c^F} = q, \tag{3}$$

where U_c^i with $i = \{H, F\}$ denote the marginal utility of consumption in Home and Foreign countries, respectively, and q is the real exchange rate. We note that an increase in q represents currency appreciation, consistent with our empirical exercise. The standard separable utility function is of the form:

$$U(C, L) = \frac{C^{1-\sigma} - 1}{1-\sigma} - \phi_L \frac{L^{1+\frac{1}{\nu}}}{1+\frac{1}{\nu}}, \tag{4}$$

where C and L are consumption and labor, respectively, σ is the relative risk aversion parameter, and ν is related to the labor supply elasticity. With this assumption, Equation (3) can be written as,

$$\frac{C^{-\sigma}}{(C^*)^{-\sigma}} = q, \tag{5}$$

where C and C^* denote consumption in home and foreign countries, respectively. This risk sharing condition implies that an increase in home consumption relative to foreign consumption is associated with real exchange rate depreciation. Additionally, the negative wealth effect associated with an increase in government spending depresses consumption. This model with complete asset markets predicts a decline in consumption, real exchange rate appreciation, and a trade balance deterioration. While the behavior of the current account in the data is consistent with the model, the empirical responses of real exchange rates do not necessarily provide support for the model. In advanced countries, real exchange rates depreciate in the data, in contrast to the model. This is the "real exchange rate puzzle" documented in the previous literature (e.g., Monacelli and Perotti 2010). Additionally, the real exchange rate–consumption relationship in the risk sharing condition, Equation (5), fails: the model predicts a negative relationship between real exchange rate appreciation and consumption, whereas the data for advanced countries support a positive relationship.

[26] The assumption on the price setting—i.e., a New Keynesian model, with producers facing a Calvo staggered price setting, versus a real international business cycle model—does not matter for the risk sharing condition if the asset markets are complete.

In developing countries, we find no "real exchange rate puzzle," as real exchange rates appreciate after an increase in government spending, as predicted by the model. However, similar to advanced countries, the risk sharing condition fails in developing countries: consumption increases, whereas the model predicts a decline in consumption. Overall, our empirical evidence does not lend support to standard models with complete asset markets.[27]

The above analyses suggest that as long as the model generates the risk sharing condition of Equation (5), it cannot be reconciled with the empirical evidence. For example, Ravn, Schmitt-Grohé, and Uribe (2012) augment standard models with deep habits to generate a real exchange rate depreciation consistent with advanced countries, but their mechanism cannot explain all the empirical findings in either advanced countries or developing countries because it produces a real exchange rate–consumption relationship similar to Equation (5). In other words, when the real exchange rate depreciates in that model, consumption increases, whereas consumption responses are negative and insignificant in the data for advanced countries.

We now discuss two common fixes for standard models in the literature that can alter the risk sharing condition: (*i*) nonseparable preferences with consumption and hours as complements, and (*ii*) limited asset market participation. Both fixes can help to reconcile the model with the empirical evidence in developing countries but not in advanced countries.

First, nonseparable preferences with no wealth effects, such as in Greenwood, Hercowitz, and Huffman (1988), can potentially generate the responses of the real exchange rate and consumption consistent with developing countries because, with no wealth effects, consumption can increase in response to an increase in government spending shocks. Furthermore, the risk sharing condition in Equation (3) depends not only on consumption but also on hours worked:

$$\frac{\left(C-\phi\frac{1}{\nu}L^{\nu}\right)^{-\sigma}}{\left(C^{*}-\phi\frac{1}{\nu}(L^{*})^{\nu}\right)^{-\sigma}}=q.$$

Therefore, the model can predict simultaneously an appreciation of the real exchange rate and an increase in consumption, consistent with the evidence for developing countries.

Second, an extension of the limited asset market participation model from the closed economy (Galí, López-Salido, and Vallés 2007) to an open economy setting can also explain the responses of the real exchange rate and consumption consistent with the developing countries results. Specifically, in the model, a fraction of households $1-\lambda$ have no access to financial markets, and so their budget constraint looks as follows:

$$C_t^n = W_t L_t^n - T_t^n,$$

where C^n is consumption, L^n is labor, T^n is taxes levied on households with no asset market access, and W is wage. In this model, consumption of these "hand-to-mouth" households increases after an increase in government spending. At the same time, the risk sharing condition holds only for

[27] We also examine the model with incomplete asset markets, in which agents can hold a one-period noncontingent bond. The theoretical predictions are broadly in line with the complete asset markets case.

households with asset market access:

$$\frac{C_a^{-\sigma}}{\left(C_a^*\right)^{-\sigma}} = q,$$

where C_a and C_a^* denote consumption of households with the access to asset markets in home and foreign countries, respectively. With the standard utility function, consumption responses of these households are similar to those in standard models (i.e., consumption of households with the asset market access declines). Real exchange rates, in turn, appreciate due to the risk sharing condition. Aggregate consumption in the economy is given by $C = \lambda C^a + (1-\lambda) C^n$; thus, as long as λ is sufficiently large, aggregate consumption can increase, consistent with the empirical findings in developing countries. These two models, however, can generate consumption increases with a currency appreciation, but they cannot generate both a decrease in consumption and a currency depreciation.

Overall, our analysis suggests that these two additional features proposed in the literature may be able to explain our findings in developing countries but not in advanced countries. These results call for a model that can explain the effects of government spending on the real exchange rate separately in advanced and developing countries.

7 Concluding Remarks

The effects of government spending in an open economy environment still are not understood well. The workhorse open economy models fail to match basic empirical regularities, giving rise to prominent "puzzles" in the international economics literature. These empirical regularities, in turn, are based on data from only a few, mostly advanced, economies. With a unique dataset covering a large number of countries, we contribute to a better understanding of the fiscal policy effects not only in advanced but also in developing countries. We provide external validity for two specific puzzles: (1) the real currency depreciation in response to an expansionary government spending shock in advanced countries; and (2) the violation of the risk-sharing condition in response to government spending shocks. We also investigate the role of development, exchange rate regimes, and trade openness in the international transmission mechanism of fiscal policy.

We document new facts, and reach a key conclusion that significant variation in specific economic conditions and institutional environments across countries leads to very different responses to fiscal shocks of exchange rates, consumption, and current accounts. Therefore, one cannot easily extend evidence from the United States or OECD countries to less developed economies. Specifically, we emphasize that although some regularities, such as the consumption–exchange rate puzzle and the decline in current accounts conditional on government spending shocks, hold uniformly across groups of countries, other puzzles hold only in developed countries (real depreciation). These data regularities are most pronounced under a flexible exchange rate; in a fixed exchange rate regime, the responses of the real exchange rate, consumption, and the current account are somewhat subdued. We show that *pooled* estimates of the responses can be quantitatively large (when a broad

panel of countries is considered), and that there is a lot of heterogeneity across countries. Finally, our paper suggests that using variation in military spending can be a promising strategy to identify and to quantify the effects of fiscal policy around the world.

Our results call for more research on the role of country-specific institutional arrangements in the transmission and propagation of fiscal shocks, and for more use of macro data from developing countries. It remains an open question whether this result can be achieved within a unified model under different, country-specific calibrations or if, instead, one needs completely separate models. We also encourage more diversity in data sources used to estimate the effect of fiscal policy on macroeconomic variables.

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Appendix

A Data

Annual data on military spending are available for 160 countries during 1989–2013, with 3,312 total observations. We use the number of years for which these two variables are available to proxy for the reliability of the data for a particular country. For this reason, we exclude 29 countries that have fewer than 15 observations for changes in military spending.[1] In addition, we also exclude Kuwait, as the country exhibited unusually large swings in military spending growth rates during and after the Gulf War. Our inclusion criteria also weed out countries that had significant wars (both in terms of severity and duration) on domestic soil, such as Afghanistan, Iraq, and Sudan, leaving us with a sample of relatively stable countries without drastic fluctuations in economic activity and military spending. For similar reasons, we also drop Angola, Pakistan, Rwanda, and Sri Lanka. The final sample contains 125 countries (29 advanced countries and 96 developing ones according to the World Bank 2000 classification) and 2,766 observations in total. Table A1 contains information on the countries available in the entire sample, as well as the number of observations available per country for our variables. The following is a detailed summary of the data used in our analysis and the relevant sources.

Table A1. Data Sources and Coverage

	Number of countries				
	Entire sample (1)	Advanced countries (2)	Developing countries (3)	Sample period (4)	Source (5)
Military spending	125	29	96	1989–2013	*Military Expenditure Database* (SIPRI)
Total government spending	125	29	96	1989–2013	*National Accounts Main Aggregates Database* (UN)
Private consumption	125	29	96	1989–2013	*NAMAD*
Real GDP	125	29	96	1989–2013	*NAMAD*
Real exchange rate (1)	125	29	96	1992–2013	Bruegel
Real exchange rate (2)	75	26	49	1989–2013	*International Financial Statistics* (IMF)
Inflation	125	29	96	1989–2013	*World Economic Outlook* (IMF)
Current account	125	29	96	1989–2013	*WEO*
Trade balance	125	29	96	1989–2013	*World Development Indicators* (World Bank)
Unemployment rate	123	29	94	1991–2013	*WDI*
Government debt	125	29	96	1989–2012	*Historical Public Debt* (IMF)
Wars	125	29	96	1989–2013	*UCDP/PRIO version 4 (2015)*
Tax rates (1)	33	24	9	1989–2013	OECD
Tax rates (2)	97	28	69	2006–2013	KPMG
Policy rates (1)	90	27	63	1989–2013	Haver Analytics
Policy rates (2)	90	27	63	1989–2013	IFS (IMF)
Exchange rate regime	121	29	92	1989–2013	Klein and Shambaugh (2008)
Political risk	107	29	78	1989–2013	*International Country Risk Guide (ICRG)*
Commodity exports (1)	124	29	95	1995–2013	*UN Conference on Trade and Development (UNCTAD)*
Commodity exports (2)	124	29	95	2000–2013	*Comtrade* (UN)
Military imports	124	29	95	2002–2012	*World Military Expenditures and Arms Transfers* (DoS)
Financial crises	125	29	96	1989–2013	Reinhart and Rogoff (2011)
International aid	21	0	21	1989–2009	Kraay (2012)

Notes: Note that Klein and Shambaugh's (2008) classification is updated up to 2013.

Military Spending Stockholm International Peace Research Institute (SIPRI) reports data on total military expenditure at constant 2011 prices in U.S. dollars for 171 countries in 1988–2013. We calculate total military spending by using SIPRI's military spending–to-GDP ratio, which is available for 164 countries in the same time period. That is, in order to compute a total military spending series at constant 2005 prices in national currency units, we multiply this ratio by real GDP obtained from the UN. SIPRI calculates the ratio of military spending to GDP in domestic currency at current prices for calendar years, where nominal GDP in national currency is

[1]The excluded countries are Afghanistan, Benin, Bosnia and Herzegovina, Central African Republic, Congo, Democratic Republic of Congo, Equatorial Guinea, Eritrea, Gabon, Gambia, Guinea, Guinea-Bissau, Haiti, Honduras, Iceland, Iraq, Liberia, Libya, Montenegro, Niger, Panama, Qatar, Tajikistan, Timor-Leste, Togo, Trinidad and Tobago, Turkmenistan, Uzbekistan, and Zimbabwe.

collected from the IMF *World Economic Outlook (WEO)*.[2]

Total Government Spending, Private Consumption, and Real GDP We obtain annual data on general government final consumption expenditure, household consumption expenditure, and real GDP at constant 2005 prices in national currency units from the UN's *National Accounts Main Aggregates Database (NAMAD)*.[3] The dataset contains time-series from 1970 onward for over 200 economies, which report to the UN's Statistics Division in the form of the National Accounts Questionnaires.[4] We use the April 2015 version of the dataset, which has data available until 2013. The *NAMAD* consumption series additionally includes the consumption expenditures of nonprofit institutions serving households.

Real Effective Exchange Rates We obtain the bulk of our annual trade-weighted real effective exchange rate (REER) data from Bruegel, an independent economic think-tank that conducts research on a variety of global and European macroeconomic policy issues. Bruegel uses a weighting matrix to derive their CPI-based REERs, with 2007 as the base year. They collect their data primarily from the databases of international organizations: namely, the World Bank's *World Development Indicators (WDI)* and *Global Economic Monitor* databases, and the IMF's *WEO* database. They further supplement their data with official data from national governments, statistics offices and central banks.[5] Their dataset is uniquely comprehensive, including annual data for 172 countries from 1992 to 2014 (178 countries for monthly observations), with more coverage than any publicly available database.[6] Due to our inclusion restrictions mentioned earlier, we utilize their annual dataset for 125 countries, for which a relatively long series of military spending is available. We use the January 2015 version of the dataset, which has data available until 2014.

Since Bruegel's series begins in 1992, we are left with the three-year period 1989–1991 for which we have data on total government and military spending, but not on REERs, resulting in a loss of almost 300 observations. To fill in this gap, we use CPI-based REERs from the IMF's *International Financial Statistics (IFS)* database. These exchange rates are period averages, with 2010 as the base year, for 96 countries between 1979 and 2014. After applying our inclusion criteria, we have the *IFS* REER data for 75 countries (26 advanced and 39 developing) during the 1989–2013 period. We splice the percentage changes in the Bruegel REER data with the percentage changes in the *IFS* REER series in all instances between 1989 and 1991 for which Bruegel data are missing. (The correlation coefficient between the changes in the series in our preferred sample is 0.9.) This allows us to regain 184 observations from over 60 countries. Thus, in our dataset, we have consistent REER data for 125 countries from 1989 to 2013.

Inflation The IMF's *WEO* database provides annual CPI data for 189 countries, beginning 1980. The *WEO* data present their annual inflation series in different ways, depending on two criteria: (1) using end-of-period values versus period averages; and (2) using percentage changes versus price indices. We use the *period-average index* for 125 countries during the 1989–2013 period. Methodologies and sources tend to differ across countries, as detailed in the national accounts notes.[7] We use the October 2015 database, which has data available until 2013, usually with estimates of the values for subsequent years.

Current Account We use current account data, as a percentage of GDP, at an annual frequency, from the IMF's *WEO* database. The dataset covers 189 countries from 1980 to 2015, while our sample retains data for 125 countries between 1989 and 2013. The IMF aggregates these data from national ministries, offices, and the IMF's Staff Estimates, and, again, there is cross-country variation in methodologies. Similar to inflation series, we use the October 2015 database.

[2] See http://www.sipri.org/research/armaments/milex/milex_database/copy_of_sources_methods and Table 1, footnote a) at http://books.sipri.org/files/FS/SIPRIFS1404.pdf.

[3] See http://unstats.un.org/unsd/nationalaccount/.

[4] For additional information and detailed methodology, see http://unstats.un.org/unsd/snaama/methodology.pdf.

[5] For detailed methodology and sources, see Darvas (2012).

[6] Darvas (2012) discusses a previous vintage of the dataset, which included data only until 2011.

[7] For more information, see the country-specific national accounts notes located at http://www.imf.org/external/pubs/ft/weo/2015/02/weodata/co.pdf.

Trade Balance We compute countries' trade balances using data on exports and imports of goods and services as a percentage of GDP from the World Bank's *WDI* database. We use the October 2015 version of the database, which has annual data for 195 countries and territories from 1960 to 2014. The exports and imports series are collected from the World Bank and the OECD national accounts data. These series exclude compensation of employees, investment income, and transfer payments.[8] The *WDI* database provides a trade balance series as well, called "Net trade in goods and services," which we do not use, because it is expressed in current U.S. dollars, thereby reflecting fluctuations in the exchange rate. Computing the trade balance as a percentage of GDP allows us to measure the trade balance at constant 2005 prices in national currency units. Overall, our dataset contains trade balance data for 125 countries in the period 1989–2013.

Unemployment Rate We obtain unemployment rate data from the World Bank's *WDI* database. The World Bank collects the unemployment series from the International Labor Organization.[9] Annual unemployment rates are available for 174 countries from 1991 to 2013. Our final sample contains labor data for 123 countries (29 advanced and 94 developing) during the 1991–2013 period.[10] We use the October 2015 edition of the database.

Government Debt The IMF's Fiscal Affairs Department compiled a comprehensive database (*Historical Public Debt*), with data for 178 countries (as well as certain groups, such as Emerging Markets, G-20, and so on) from 1875 to 2012.[11] The data are available at an annual frequency, and gross government debt is reported as a median percentage of GDP. The IMF constructs their dataset using a variety of sources, including statistical handbooks, official government publications, and other databases compiled by researchers and independent organizations. An earlier version of the data was used in an IMF working paper expanding upon work in Chapter 3 of the October 2012 edition of the IMF *WEO*.[12] In our sample, we have debt-to-GDP ratios for 125 countries from 1989 to 2012. This dataset is an extended version of the historical debt data used in Pescatori, Sandri, and Simon (2014).

Wars, Taxes, Interest Rates, Exchange Rate Regimes Data on wars, marginal tax rates, interest rates, and exchange rate regime classifications are as followed. The data on wars are from the Correlates of War (COW) project. The dataset contains information on participating countries, start and end dates, and the number of battle deaths for each conflict, up to 2007. Annual marginal tax rate data are taken from the OECD *Central Government Personal Income Tax Rates and Thresholds* dataset for 33 OECD countries in the period 1981–2014. We choose the top marginal income tax rate as our preferred measure. We further augment this measure with marginal income tax rates provided by KPMG, a Big Four auditor, for both advanced and developing countries during 2006–2014. End-of-period policy rates and discount rates are collected from Haver Analytics and the IMF's IFS database. Exchange rate regime classifications are based on the IMF, Shambaugh (2004), Levy-Yeyati and Sturzenegger (2005), Klein and Shambaugh (2008), and Ilzetzki, Reinhart, and Rogoff (2009). In our analysis, we use the Klein and Shambaugh (2008) classification as the baseline.

Other Control Variables We also explore robustness of our results to the degree of political risk, commodity exports, military imports, financial crises, and international aid. The data sources for these control variables are summarized in Table A1.

[8] For details on methodology and for country-specific notes for the exports series, see http://databank.worldbank.org/data/reports.aspx?source=2&type=metadata&series=NE.EXP.GNFS.ZS. For the imports series, see http://databank.worldbank.org/data/reports.aspx?source=2&type=metadata&series=NE.IMP.GNFS.ZS.

[9] For details on methodology and for country-specific notes, see the metadata for the series.

[10] The countries for which World Bank labor data are unavailable are Djibouti and the Seychelles.

[11] For many advanced countries, the series starts around this date, while the data for the United Kingdom goes back to the late 17th century. For the majority of countries, however, the data start at 1970 or later.

[12] For detailed methodology for the first version of the data (Abbas et al. 2010); and for the more recent IMF working paper, see Pescatori, Sandri, and Simon (2014).

B Baseline Sample

Country name	Sample period	Development	ER regime	Trade
Albania	1993–2013	Developing	Flexible	Open
Algeria	1989–2013	Developing	Flexible	Closed
Argentina	1989–2013	Developing	Flexible	Closed
Armenia	1993–2013	Developing	Flexible	Open
Australia	1989–2013	Advanced	Flexible	Closed
Austria	1989–2013	Advanced	Fixed	Open
Azerbaijan	1993–2013	Developing	Flexible	Open
Bahrain	1989–2013	Developing	Fixed	Open
Bangladesh	1989–2013	Developing	Fixed	Closed
Belarus	1993–2013	Developing	Flexible	Open
Belgium	1989–2013	Advanced	Fixed	Open
Belize	1989–2013	Developing	Fixed	Open
Bolivia	1990–2013	Developing	Flexible	Closed
Botswana	1989–2013	Developing	Flexible	Open
Brazil	1989–2013	Developing	Flexible	Closed
Brunei	1989–2013	Advanced	Fixed	Open
Bulgaria	1990–2013	Developing	Fixed	Open
Burkina Faso	1989–2013	Developing	Fixed	Closed
Burundi	1989–2013	Developing	Flexible	Closed
Cambodia	1989–2013	Developing	NA	Open
Cameroon	1989–2013	Developing	Fixed	Closed
Canada	1989–2013	Advanced	Flexible	Open
Cape Verde	1993–2011	Developing	Fixed	Open
Chad	1994–2011	Developing	Fixed	Open
Chile	1989–2013	Developing	Flexible	Open
China	1990–2013	Developing	Fixed	Closed
Colombia	1989–2013	Developing	Flexible	Closed
Côte d'Ivoire	1989–2012	Developing	Fixed	Open
Croatia	1993–2013	Developing	Flexible	Open
Cyprus	1989–2013	Advanced	Fixed	Open
Czech Republic	1994–2013	Developing	Flexible	Open
Denmark	1989–2013	Advanced	Fixed	Open
Djibouti	1989–2008	Developing	Fixed	Open
Dominican Republic	1989–2013	Developing	Flexible	Open
Ecuador	1989–2013	Developing	NA	Closed
Egypt	1989–2013	Developing	Fixed	Closed
El Salvador	1989–2013	Developing	Fixed	Open
Estonia	1993–2013	Developing	Fixed	Open
Ethiopia	1991–2013	Developing	Varies	Closed
Fiji	1989–2013	Developing	Flexible	Open
Finland	1989–2013	Advanced	Fixed	Open
France	1989–2013	Advanced	Fixed	Closed
Georgia	1997–2013	Developing	Flexible	Open
Germany	1989–2013	Advanced	Flexible	Open
Ghana	1989–2013	Developing	Flexible	Open
Greece	1989–2013	Advanced	Fixed	Closed
Guatemala	1989–2013	Developing	Flexible	Closed
Guyana	1989–2013	Developing	Fixed	Open

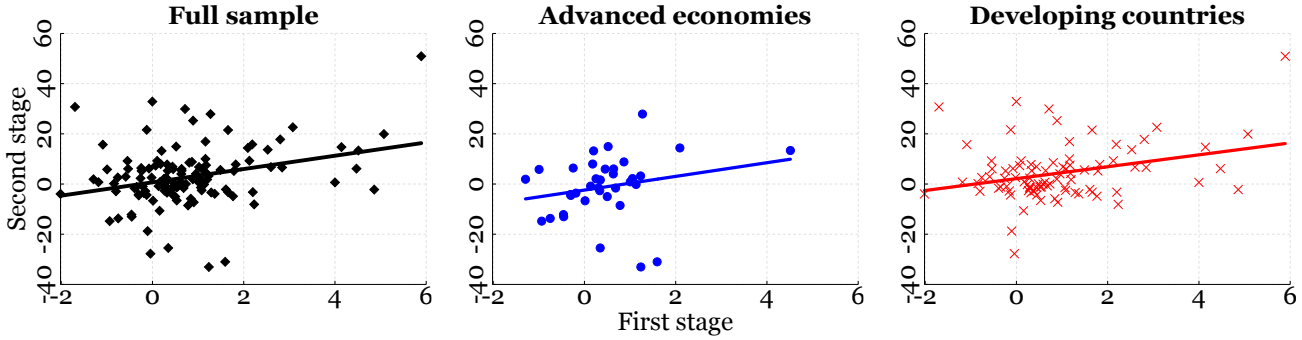
Hungary	1989–2013	Developing	Flexible	Open
India	1989–2013	Developing	Flexible	Closed
Indonesia	1989–2013	Developing	Flexible	Closed
Iran	1989–2012	Developing	Flexible	Closed
Ireland	1989–2013	Advanced	Fixed	Open
Israel	1989–2013	Advanced	Flexible	Open
Italy	1989–2013	Advanced	Fixed	Closed
Jamaica	1990–2013	Developing	Flexible	Open
Japan	1989–2013	Advanced	Flexible	Closed
Jordan	1989–2013	Developing	Fixed	Open
Kazakhstan	1994–2013	Developing	Flexible	Open
Kenya	1989–2013	Developing	Flexible	Closed
Korea	1989–2013	Developing	Flexible	Open
Kyrgyzstan	1993–2013	Developing	Flexible	Open
Laos	1993–2012	Developing	Flexible	Open
Latvia	1994–2013	Developing	Flexible	Open
Lebanon	1991–2013	Developing	Fixed	Open
Lesotho	1989–2013	Developing	Fixed	Open
Lithuania	1994–2013	Developing	Fixed	Open
Luxembourg	1989–2013	Advanced	Fixed	Open
Macedonia	1997–2013	Developing	Fixed	Open
Madagascar	1989–2013	Developing	Flexible	Open
Malawi	1989–2013	Developing	Flexible	Open
Malaysia	1989–2013	Developing	Flexible	Open
Mali	1989–2013	Developing	Fixed	Open
Malta	1989–2013	Advanced	Fixed	Open
Mauritania	1989–2009	Developing	Flexible	Open
Mauritius	1989–2013	Developing	Flexible	Open
Mexico	1989–2013	Developing	Flexible	Closed
Moldova	1994–2013	Developing	Flexible	Open
Mongolia	1991–2012	Developing	Flexible	Open
Morocco	1989–2013	Developing	Fixed	Open
Mozambique	1989–2010	Developing	Flexible	Closed
Namibia	1991–2013	Developing	Fixed	Open
Nepal	1989–2013	Developing	Fixed	Closed
Netherlands	1989–2013	Advanced	Fixed	Open
New Zealand	1989–2013	Advanced	Flexible	Closed
Nicaragua	1991–2013	Developing	Flexible	Open
Nigeria	1989–2013	Developing	Flexible	Closed
Norway	1989–2013	Advanced	Flexible	Open
Oman	1989–2013	Developing	Fixed	Open
Papua New Guinea	1989–2013	Developing	Flexible	Open
Paraguay	1990–2013	Developing	Flexible	Open
Peru	1990–2013	Developing	Flexible	Closed
Philippines	1989–2013	Developing	Flexible	Open
Poland	1989–2013	Developing	Flexible	Open
Portugal	1989–2013	Advanced	Fixed	Open
Romania	1989–2013	Developing	Flexible	Open
Russia	1993–2013	Developing	Flexible	Closed
Saudi Arabia	1989–2013	Developing	Fixed	Open
Senegal	1989–2010	Developing	Fixed	Open
Serbia	1998–2013	Developing	NA	Open

Seychelles	1989–2013	Developing	Flexible	Open
Sierra Leone	1989–2013	Developing	Flexible	Closed
Singapore	1989–2013	Advanced	Flexible	Open
Slovak Republic	1994–2013	Developing	Flexible	Open
Slovenia	1993–2013	Advanced	Fixed	Open
South Africa	1989–2013	Developing	Flexible	Closed
Spain	1989–2013	Advanced	Fixed	Closed
Swaziland	1989–2013	Developing	Fixed	Open
Sweden	1989–2013	Advanced	Flexible	Open
Switzerland	1989–2013	Advanced	Flexible	Open
Syria	1989–2010	Developing	NA	Open
Tanzania	1989–2013	Developing	Flexible	Closed
Thailand	1989–2013	Developing	Flexible	Open
Tunisia	1989–2013	Developing	Flexible	Open
Turkey	1989–2013	Developing	Flexible	Closed
United Arab Emirates	1998–2012	Advanced	Fixed	Open
Uganda	1989–2013	Developing	Flexible	Closed
Ukraine	1994–2013	Developing	Fixed	Open
United Kingdom	1989–2013	Advanced	Flexible	Closed
United States	1989–2013	Advanced	Flexible	Closed
Uruguay	1989–2013	Developing	Flexible	Closed
Venezuela	1992–2013	Developing	Flexible	Closed
Vietnam	1989–2013	Developing	Varies	Open
Yemen	1991–2013	Developing	Fixed	Open
Zambia	1989–2013	Developing	Flexible	Open

Notes: The exchange rate classification varies across years. The table values are for the median year. "NA" denotes that data are unavailable. "Varies" denotes the there are equal numbers of fixed and flexible episodes in the sample. 125 countries in total.

C Additional Results

Figure C1. Coefficients of the Baseline Specification: First Stage vs. Second Stage



Notes: This figure shows the scatterplot of the coefficients of the first stage regression (government spending on military spending) and the coefficients of the second stage regression (the real effective exchange rate on military spending) in all countries (left panel), advanced economies (middle panel), and developing economies (right panel). The solid lines depict linear fit.

Table C1. Real Exchange Rate Response in Advanced and Developing Countries: Robustness to Controls

	(1)[b]	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Wars	Y	Y	Y	Y	Y	N	Y	Y	Y
Country effects	Y	N	Y	N	Y	Y	Y	Y	Y
Time effects	N	N	N	Y	Y	N	N	Y	Y
Unemployment lag	N	N	N	N	N	N	Y	N	Y
GDP growth lag	Y	N	N	N	N	N	N	Y	N
Panel A: Full sample									
On impact	3.67***	3.89***	3.68***	3.95***	3.74***	3.68***	4.49***	3.77***	4.56***
	(1.31)	(1.25)	(1.22)	(1.32)	(1.30)	(1.23)	(1.38)	(1.36)	(1.49)
1 year	7.01***	7.14***	7.18***	7.27***	7.22***	7.23***	8.88***	7.17***	9.02***
	(2.57)	(2.32)	(2.42)	(2.52)	(2.64)	(2.50)	(2.72)	(2.75)	(3.02)
2 years	4.90**	5.62**	5.60**	6.03**	5.94**	5.71**	7.63***	5.50**	8.24***
	(2.49)	(2.31)	(2.46)	(2.48)	(2.66)	(2.54)	(2.81)	(2.68)	(3.14)
3 years	2.94	4.75*	4.14	4.61	3.91	4.25	5.87*	3.21	5.97*
	(2.90)	(2.69)	(2.93)	(2.85)	(3.10)	(2.96)	(3.28)	(3.11)	(3.53)
First-stage *F*	30.8	33.3	33.9	30.5	30.7	33.9	29.5	28.3	26.6
Obs.	2,354	2,354	2,354	2,354	2,354	2,354	2,287	2,354	2,287
Panel B: Advanced economies									
On impact	−3.00*	−2.48**	−2.94**	−1.72	−2.28	−2.92**	−3.37**	−2.08	−2.43
	(1.71)	(1.14)	(1.35)	(1.90)	(2.28)	(1.34)	(1.64)	(2.50)	(2.51)
1 year	−4.18	−3.06	−3.99*	−2.69	−4.19	−3.90*	−4.90*	−4.07	−4.44
	(2.85)	(1.97)	(2.31)	(3.21)	(3.79)	(2.28)	(2.87)	(4.22)	(4.17)
2 years	−6.17*	−4.57	−6.06*	−5.99	−8.56	−6.00*	−7.47**	−8.00	−8.43
	(3.69)	(2.85)	(3.23)	(4.99)	(5.72)	(3.19)	(3.72)	(6.07)	(5.71)
3 years	−10.73**	−8.02**	−10.27**	−8.40	−11.75	−10.21**	−12.03**	−11.01	−12.05
	(5.11)	(4.04)	(4.62)	(6.73)	(7.55)	(4.57)	(5.24)	(7.73)	(7.74)
First-stage *F*	19.1	16.5	16.3	15.4	14.5	16.3	17.2	15.1	13.4
Obs.	643	643	643	643	643	643	618	643	618
Panel C: Developing countries									
On impact	4.67***	4.80***	4.62***	5.17***	4.96***	4.60***	5.70***	5.04***	5.98***
	(1.52)	(1.47)	(1.42)	(1.62)	(1.57)	(1.43)	(1.64)	(1.64)	(1.83)
1 year	8.76***	8.64***	8.85***	9.37***	9.49***	8.90***	11.10***	9.54***	11.61***
	(3.04)	(2.73)	(2.85)	(3.08)	(3.24)	(2.94)	(3.31)	(3.37)	(3.78)
2 years	6.78**	7.14***	7.47**	8.41***	8.68***	7.60**	10.22***	8.35**	11.18***
	(2.94)	(2.73)	(2.91)	(3.10)	(3.36)	(3.00)	(3.47)	(3.36)	(4.07)
3 years	5.20	6.49**	6.38*	6.65*	6.35*	6.50*	8.70**	5.86	8.48*
	(3.29)	(3.07)	(3.36)	(3.47)	(3.85)	(3.40)	(3.85)	(3.80)	(4.43)
First-stage *F*	23.9	25.5	26.4	21.5	22.1	26.5	22.4	20.7	18.7
Obs.	1,711	1,711	1,711	1,711	1,711	1,711	1,669	1,711	1,669

Notes: This table reports the response of the REER to an increase in g shock of 1 percent of GDP. We use the World Bank (2000) classification. The superscript b denotes our baseline specification. The column with a superscript b is the baseline results.

Table C2. Current Account–to-GDP Response: Robustness to Controls

	(1)[b]	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Wars	Y	Y	Y	Y	Y	N	Y	Y	Y
Country effects	Y	N	Y	N	Y	Y	Y	Y	Y
Time effects	N	N	N	Y	Y	N	N	Y	Y
Unemployment lag	N	N	N	N	N	N	Y	N	Y
GDP growth lag	Y	N	N	N	N	N	N	Y	N
Panel A: Full sample									
On impact	−2.69***	−2.57***	−2.70***	−2.74***	−2.88***	−2.70***	−3.38***	−2.92***	−3.56***
	(1.02)	(0.86)	(0.94)	(0.89)	(0.98)	(0.94)	(1.05)	(1.03)	(1.09)
1 year	−4.95***	−4.12***	−4.84***	−4.20***	−4.90***	−4.84***	−5.82***	−5.02***	−5.85***
	(1.50)	(1.26)	(1.39)	(1.31)	(1.43)	(1.39)	(1.62)	(1.52)	(1.68)
2 years	−3.30*	−2.52*	−3.36**	−2.59	−3.45*	−3.36**	−4.35**	−3.46*	−4.37**
	(1.80)	(1.53)	(1.68)	(1.61)	(1.77)	(1.68)	(1.83)	(1.87)	(1.93)
3 years	−2.37	−1.75	−2.76*	−1.64	−2.63	−2.74*	−3.30*	−2.46	−3.11*
	(1.66)	(1.36)	(1.58)	(1.46)	(1.67)	(1.58)	(1.72)	(1.73)	(1.80)
First-stage *F*	32.5	36.7	37.3	32.4	33.2	37.3	31.8	29.5	28.1
Obs.	2,408	2,408	2,408	2,408	2,408	2,408	2,320	2,408	2,320
Panel B: Advanced economies									
On impact	−2.04*	−1.73*	−2.03*	−1.97	−2.34	−2.02*	−2.13*	−2.32	−2.56
	(1.17)	(0.94)	(1.17)	(1.26)	(1.61)	(1.16)	(1.23)	(1.58)	(1.67)
1 year	−6.18	−4.84	−6.17	−5.98	−7.62	−6.14	−6.27	−7.57	−7.64
	(4.13)	(3.10)	(4.11)	(3.77)	(5.11)	(4.08)	(3.95)	(4.97)	(4.68)
2 years	−5.06	−3.57	−5.06	−4.27	−6.01	−5.01	−4.78	−6.01	−5.62
	(5.38)	(4.11)	(5.34)	(4.88)	(6.55)	(5.29)	(5.03)	(6.44)	(5.78)
3 years	−3.60	−2.44	−3.62	−3.19	−4.46	−3.59	−3.40	−4.49	−4.22
	(3.87)	(2.87)	(3.79)	(3.45)	(4.60)	(3.75)	(3.52)	(4.52)	(3.98)
First-stage *F*	32.3	30.5	27.8	28.0	24.9	28.1	31.2	25.8	24.5
Obs.	629	629	629	629	629	629	605	629	605
Panel C: Developing countries									
On impact	−2.75**	−2.68***	−2.76**	−2.91***	−2.99***	−2.76**	−3.55***	−3.01**	−3.75***
	(1.16)	(1.00)	(1.07)	(1.05)	(1.13)	(1.08)	(1.23)	(1.19)	(1.29)
1 year	−4.78***	−3.99***	−4.63***	−4.07***	−4.67***	−4.63***	−5.77***	−4.79***	−5.78***
	(1.59)	(1.39)	(1.47)	(1.45)	(1.51)	(1.47)	(1.81)	(1.61)	(1.89)
2 years	−3.03	−2.29	−3.06*	−2.45	−3.21*	−3.06*	−4.30**	−3.25*	−4.36**
	(1.89)	(1.65)	(1.74)	(1.72)	(1.80)	(1.74)	(2.00)	(1.92)	(2.08)
3 years	−2.09	−1.55	−2.54	−1.28	−2.23	−2.52	−3.22*	−2.07	−2.83
	(1.80)	(1.51)	(1.72)	(1.61)	(1.77)	(1.72)	(1.94)	(1.84)	(1.98)
First-stage *F*	24.9	27.7	28.7	22.8	23.8	28.7	23.9	21.6	19.5
Obs.	1,779	1,779	1,779	1,779	1,779	1,779	1,715	1,779	1,715

Notes: This table reports the response of the current account–to-output ratio to an increase in g of 1 percent of GDP. The g shocks are constructed using military spending as an instrument for total government spending. The column with a superscript b is the baseline results.

Table C3. Net Exports–to-GDP Ratio Response

	(1)[b]	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Wars	Y	Y	Y	Y	Y	N	Y	Y	Y
Country effects	Y	N	Y	N	Y	Y	Y	Y	Y
Time effects	N	N	N	Y	Y	N	N	Y	Y
Unemployment lag	N	N	N	N	N	N	Y	N	Y
GDP growth lag	Y	N	N	N	N	N	N	Y	N
Panel A: Full sample									
On impact	−4.30***	−3.93***	−4.13***	−4.15***	−4.41***	−4.12***	−4.73***	−4.60***	−5.04***
	(1.26)	(1.02)	(1.14)	(1.10)	(1.25)	(1.14)	(1.26)	(1.37)	(1.40)
1 year	−7.23***	−6.54***	−6.85***	−6.74***	−7.02***	−6.86***	−7.39***	−7.41***	−7.48***
	(1.99)	(1.67)	(1.81)	(1.81)	(1.98)	(1.82)	(2.03)	(2.16)	(2.20)
2 years	−5.06**	−4.66**	−4.88**	−4.93**	−5.07**	−4.89**	−5.05**	−5.28**	−5.18**
	(2.11)	(1.82)	(1.93)	(2.01)	(2.14)	(1.94)	(2.16)	(2.31)	(2.36)
3 years	−4.34**	−3.90**	−4.34**	−4.17**	−4.51**	−4.35**	−4.54**	−4.60**	−4.70**
	(2.02)	(1.80)	(1.84)	(1.96)	(2.01)	(1.84)	(2.10)	(2.17)	(2.27)
First-stage *F*	27.8	33.6	32.5	29.8	28.5	32.5	27.7	24.8	24.7
Obs.	2,369	2,369	2,369	2,369	2,369	2,369	2,284	2,369	2,284
Panel B: Advanced economies									
On impact	−5.68	−5.27	−5.72	−6.11	−6.80	−5.69	−5.93	−6.64	−7.17
	(3.92)	(3.63)	(4.13)	(3.94)	(4.70)	(4.09)	(4.22)	(4.36)	(4.77)
1 year	−9.04	−8.83	−9.05	−10.28	−10.80	−8.99	−9.23	−10.68	−11.10
	(6.82)	(6.63)	(7.01)	(7.44)	(8.26)	(6.95)	(6.97)	(7.95)	(8.05)
2 years	−5.87	−6.21	−5.88	−7.06	−6.75	−5.84	−5.34	−6.73	−6.33
	(7.02)	(6.97)	(7.09)	(8.04)	(8.61)	(7.02)	(6.84)	(8.42)	(8.07)
3 years	−3.04	−3.99	−3.05	−4.84	−3.82	−3.02	−2.32	−3.91	−3.21
	(5.29)	(5.90)	(5.24)	(6.85)	(6.46)	(5.19)	(4.86)	(6.40)	(5.78)
First-stage *F*	18.2	18.4	17.7	18.2	17.0	17.9	18.5	16.2	16.0
Obs.	636	636	636	636	636	636	610	636	610
Panel C: Developing countries									
On impact	−4.00***	−3.73***	−3.88***	−4.08***	−4.28***	−3.87***	−4.53***	−4.41***	−4.99***
	(1.27)	(1.04)	(1.14)	(1.21)	(1.35)	(1.14)	(1.30)	(1.46)	(1.57)
1 year	−6.87***	−6.18***	−6.49***	−6.39***	−6.66***	−6.51***	−7.10***	−7.02***	−7.14***
	(1.99)	(1.64)	(1.79)	(1.83)	(2.01)	(1.80)	(2.08)	(2.21)	(2.31)
2 years	−4.94**	−4.35**	−4.71**	−4.72**	−4.98**	−4.73**	−4.99**	−5.23**	−5.18**
	(2.15)	(1.78)	(1.95)	(1.97)	(2.14)	(1.96)	(2.27)	(2.33)	(2.46)
3 years	−4.55**	−3.83**	−4.52**	−4.04**	−4.63**	−4.54**	−4.91**	−4.75**	−5.00*
	(2.22)	(1.91)	(2.01)	(2.06)	(2.17)	(2.02)	(2.39)	(2.36)	(2.55)
First-stage *F*	21.2	25.5	24.9	20.6	19.9	24.9	20.7	17.6	16.8
Obs.	1,733	1,733	1,733	1,733	1,733	1,733	1,674	1,733	1,674

Notes: This table reports the response of the net exports–to-output ratio to an increase in g of 1 percent of GDP. The g shocks are constructed using military spending as an instrument for total government spending. The superscript b denotes our baseline specification.

Table C4. Consumption Response: Robustness to Controls

	(1)[b]	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Wars	Y	Y	Y	Y	Y	N	Y	Y	Y
Country effects	Y	N	Y	N	Y	Y	Y	Y	Y
Time effects	N	N	N	Y	Y	N	N	Y	Y
Unemployment lag	N	N	N	N	N	N	Y	N	Y
GDP growth lag	Y	N	N	N	N	N	N	Y	N
Panel A: Full sample									
On impact	2.40**	3.27***	2.73**	3.80***	3.26***	2.69**	3.17***	2.99***	3.84***
	(1.07)	(1.13)	(1.12)	(1.18)	(1.18)	(1.12)	(1.16)	(1.13)	(1.25)
1 year	5.71***	7.12***	6.16***	7.69***	6.66***	6.12***	6.86***	6.29***	7.59***
	(1.77)	(1.95)	(1.80)	(2.01)	(1.86)	(1.79)	(2.01)	(1.81)	(2.14)
2 years	5.73**	8.20***	6.25***	8.84***	6.82***	6.13**	6.62**	6.37**	7.57***
	(2.42)	(2.70)	(2.42)	(2.78)	(2.51)	(2.39)	(2.68)	(2.49)	(2.87)
3 years	5.63*	9.44***	6.36**	10.07***	6.95**	6.25**	6.72**	6.44**	7.75**
	(3.01)	(3.50)	(2.98)	(3.54)	(3.00)	(2.96)	(3.30)	(3.00)	(3.42)
First-stage F	32.6	32.4	33.9	30.7	31.8	33.9	29.8	30.6	27.6
Obs.	2,447	2,447	2,447	2,447	2,447	2,447	2,359	2,447	2,359
Panel B: Advanced economies									
On impact	−2.60	−2.54	−3.32	−2.57	−3.63	−3.30	−3.36	−2.73	−3.62
	(3.19)	(3.34)	(3.69)	(3.63)	(4.25)	(3.66)	(3.71)	(3.73)	(4.23)
1 year	−1.33	−1.29	−2.59	−0.61	−2.19	−2.56	−2.63	−0.81	−2.43
	(1.94)	(2.20)	(2.28)	(2.57)	(2.58)	(2.25)	(2.28)	(2.50)	(2.61)
2 years	−0.75	−0.65	−2.51	0.23	−2.06	−2.47	−2.83	−0.30	−2.76
	(2.68)	(3.32)	(3.19)	(3.79)	(3.53)	(3.15)	(3.47)	(3.22)	(3.95)
3 years	−3.70	−2.12	−6.09	−0.14	−4.38	−6.01	−5.90	−2.36	−4.77
	(4.68)	(5.85)	(5.69)	(5.99)	(5.84)	(5.61)	(6.00)	(5.12)	(6.21)
First-stage F	20.6	18.0	15.4	16.1	13.1	15.6	15.5	16.8	13.5
Obs.	644	644	644	644	644	644	618	644	618
Panel C: Developing countries									
On impact	2.97**	3.97***	3.38***	4.54***	3.92***	3.33***	3.93***	3.62***	4.63***
	(1.16)	(1.25)	(1.21)	(1.35)	(1.32)	(1.22)	(1.28)	(1.26)	(1.45)
1 year	6.89***	8.36***	7.35***	8.67***	7.53***	7.31***	8.35***	7.19***	8.78***
	(2.07)	(2.30)	(2.10)	(2.36)	(2.16)	(2.09)	(2.41)	(2.11)	(2.57)
2 years	6.96**	9.69***	7.52***	9.92***	7.65***	7.38***	8.26**	7.23**	8.81***
	(2.86)	(3.22)	(2.86)	(3.23)	(2.89)	(2.83)	(3.26)	(2.87)	(3.41)
3 years	7.16**	11.15***	7.97**	10.99***	7.71**	7.84**	8.65**	7.21**	8.93**
	(3.51)	(4.12)	(3.47)	(4.01)	(3.36)	(3.44)	(3.93)	(3.37)	(3.94)
First-stage F	25.8	25.4	27.0	22.7	24.0	27.0	23.2	23.2	20.1
Obs.	1,803	1,803	1,803	1,803	1,803	1,803	1,741	1,803	1,741

Notes: This table reports the response of consumption (in percent) to an increase in g of 1 percent of GDP. The g shocks are constructed using military spending as an instrument for total government spending. The column with a superscript b is the baseline results.

Table C5. REER Response to Government Spending Shocks: Middle and Low Income Countries

	(1)[b]	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Wars	Y	Y	Y	Y	Y	N	Y	Y	Y
Country effects	Y	N	Y	N	Y	Y	Y	Y	Y
Time effects	N	N	N	Y	Y	N	N	Y	Y
Unemployment lag	N	N	N	N	N	N	Y	N	Y
GDP growth lag	Y	N	N	N	N	N	N	Y	N
Panel A: Middle income countries									
On impact	3.92**	4.08**	3.94**	4.90***	4.81**	3.97**	5.37**	4.79**	6.14**
	(1.72)	(1.84)	(1.74)	(1.88)	(1.99)	(1.75)	(2.08)	(2.06)	(2.41)
1 year	8.66**	8.78***	8.88**	10.45***	10.64**	9.28**	11.68***	10.52**	13.00***
	(3.36)	(3.71)	(3.50)	(3.96)	(4.24)	(3.88)	(4.06)	(4.38)	(4.89)
2 years	4.93	5.99*	6.11*	8.39**	8.61**	6.70*	9.61**	7.99**	11.45**
	(3.17)	(3.20)	(3.29)	(3.95)	(4.19)	(3.65)	(3.84)	(4.07)	(4.98)
3 years	1.98	4.13	3.82	5.31	4.88	4.41	6.96*	4.06	7.04
	(3.45)	(3.57)	(3.69)	(4.24)	(4.73)	(3.83)	(4.19)	(4.50)	(5.39)
First-stage *F*	14.1	17.1	15.7	15.0	13.3	16.1	12.8	12.4	11.0
Obs.	1,137	1,137	1,137	1,137	1,137	1,137	1,103	1,137	1,103
Panel B: Low income countries									
On impact	6.16**	6.11**	6.00**	6.19*	6.02**	5.81**	6.45**	6.21**	6.54**
	(2.78)	(2.62)	(2.43)	(3.24)	(2.75)	(2.40)	(2.59)	(2.83)	(3.10)
1 year	8.42*	8.07*	8.35*	8.48*	8.71*	8.15*	9.47*	8.78*	9.90*
	(4.38)	(4.68)	(4.40)	(4.60)	(4.63)	(4.28)	(5.09)	(4.79)	(5.62)
2 years	9.25	8.88*	9.28*	10.11*	10.65*	9.27*	10.33	10.60	11.79
	(5.08)	(5.67)	(5.44)	(5.72)	(6.36)	(5.43)	(6.29)	(6.46)	(7.28)
3 years	10.28	10.93*	10.53	12.35	12.44	10.56	11.27	12.37	13.14
	(6.63)	(7.27)	(7.13)	(8.05)	(8.81)	(7.12)	(7.74)	(8.93)	(9.33)
First-stage *F*	9.7	7.7	10.4	5.8	8.3	11.0	9.4	8.1	7.2
Obs.	574	574	574	574	574	574	566	574	566

Notes: This table reports the response of the real effective exchange rate to an increase in g shock of 1 percent of GDP. We use the World Banks's classification of countries in 2000: middle income countries (both upper- and lower-middle income) and low income countries. The superscript *b* denotes our baseline specification.

Table C6. The Responses of Tax Rates, Government Debt, and Inflation

	Tax Rate			***Government Debt***			***Inflation***		
	All	Adv	Dev	All	Adv	Dev	All	Adv	Dev
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
On impact	−0.14	−2.09	0.28	−1.89	2.36	−2.64*	−5.59***	−1.56	−6.08***
	(0.48)	(2.14)	(0.53)	(1.38)	(2.42)	(1.53)	(2.02)	(1.02)	(2.31)
1 year	0.65	−1.23	1.11*	−2.54	2.61	−3.68	−10.39**	−2.82	−11.43**
	(0.53)	(1.09)	(0.64)	(2.94)	(3.78)	(3.39)	(4.79)	(2.41)	(5.48)
2 years	0.47	−1.66	0.90	3.43	3.43	2.79	−6.92	−5.43	−7.49
	(0.63)	(1.51)	(0.62)	(5.28)	(5.59)	(6.04)	(11.91)	(3.73)	(13.58)
3 years	1.04	1.85	0.85	0.36	3.14	−0.99	−3.08	−7.75	−2.36
	(0.96)	(2.29)	(0.98)	(4.74)	(6.35)	(5.57)	(24.24)	(5.17)	(27.34)
First-stage *F*	10.7	6.5	7.5	28.6	18.9	22.8	33.8	12.7	27.2
Obs.	463	167	296	2,206	591	1,615	2,416	631	1,785

Notes: This table reports the response of top marginal tax rate, government debt–to-GDP ratio, and inflation to an increase in *g* of 1 percent of GDP. The *g* shocks are constructed using military spending as an instrument for total government spending. We estimate the baseline specification for the sample between 1989 and 2007. The results are similar with other specifications.

Table C7. Responses to Government Spending Shocks under Fixed and Floating Exchange Rate Regimes

	Fixed Exchange Rate			*Flexible Exchange Rate*		
	Full sample (1)	Advanced economies (2)	Developing countries (3)	Full sample (4)	Advanced economies (5)	Developing countries (6)
			Panel A: Real exchange rate			
On impact	0.75	0.16	1.06	5.44***	−3.99*	6.74***
	(1.45)	(2.59)	(1.66)	(1.80)	(2.12)	(2.09)
1 year	−0.77	−0.65	−0.77	11.19***	−8.24**	13.57***
	(2.55)	(3.51)	(2.91)	(3.81)	(3.98)	(4.42)
2 years	−2.20	−6.69	−2.44	8.62***	−12.48**	11.23***
	(3.99)	(8.72)	(4.79)	(3.09)	(5.94)	(3.59)
3 years	−8.03	−19.87	−8.67	9.57**	−16.02**	13.26***
	(6.66)	(24.78)	(7.84)	(3.87)	(7.39)	(4.61)
First-stage *F*	10.4	6.3	8.2	24.4	10.2	19.4
Obs.	1,089	404	752	1,265	306	959
			Panel B: Current account–to-GDP ratio			
On impact	−3.30*	−4.11***	−3.18	−1.92**	−0.32	−2.14**
	(1.78)	(1.44)	(1.99)	(0.87)	(1.84)	(0.97)
1 year	−4.77*	−7.63	−3.40	−4.67***	0.43	−5.35***
	(2.54)	(4.66)	(2.50)	(1.36)	(1.96)	(1.53)
2 years	−2.29	−8.90	−0.38	−3.65**	1.53	−4.33***
	(3.23)	(6.61)	(3.08)	(1.49)	(1.59)	(1.68)
3 years	−0.59	−4.29	0.59	−3.68***	−0.67	−3.92**
	(3.02)	(6.15)	(3.17)	(1.37)	(1.48)	(1.56)
First-stage *F*	12.0	15.2	9.2	22.4	9.3	17.6
Obs.	1,096	401	767	1,312	300	1,012
			Panel C: Consumption			
On impact	1.49	0.42	1.36	2.40**	−7.26**	3.42***
	(1.74)	(2.65)	(1.76)	(1.12)	(3.64)	(1.15)
1 year	5.66*	2.66	6.11*	5.21**	−8.23**	6.57***
	(2.96)	(2.40)	(3.46)	(2.20)	(3.56)	(2.40)
2 years	5.75	3.07	6.39	5.68**	−7.01**	6.94**
	(4.20)	(3.32)	(5.06)	(2.55)	(3.15)	(2.84)
3 years	6.32	0.91	7.28	5.57	−8.10**	7.14*
	(4.70)	(5.95)	(5.45)	(3.70)	(3.52)	(4.19)
First-stage *F*	11.6	11.9	9.3	23.5	15.8	18.7
Obs.	1,131	416	793	1,316	306	1,010

Notes: This table reports the response of the REER (Panel A), current account–to-GDP ratio (Panel B), and consumption, in percent, (Panel C) to an increase in g shock of 1 percent of GDP by exchange rate regimes, using the baseline specification. The g shocks are constructed using military spending as an instrument for total government spending.

Table C8. Responses to Government Spending Shocks by Trade Openness

	Closed Economies			*Open Economies*		
	Full sample (1)	Advanced economies (2)	Developing countries (3)	Full sample (4)	Advanced economies (5)	Developing countries (6)
			Panel A: Real exchange rate			
On impact	6.95	−5.86	8.95	3.03***	−2.25	3.76***
	(5.24)	(5.43)	(6.30)	(1.11)	(1.90)	(1.26)
1 year	21.87**	−9.12	26.39**	4.00**	−3.28	5.05**
	(11.09)	(9.27)	(12.88)	(1.74)	(3.18)	(2.00)
2 years	13.76	−9.85	18.07	3.34	−5.68	4.76*
	(9.90)	(10.70)	(11.70)	(2.18)	(4.04)	(2.52)
3 years	11.87	−23.73	16.79	1.80	−9.34*	3.53
	(12.78)	(17.36)	(15.08)	(2.68)	(4.86)	(2.99)
First-stage *F*	10.7	4.4	8.3	22.1	13.7	17.2
Obs.	796	207	589	1,558	436	1,122
			Panel B: Current account–to-GDP ratio			
On impact	−3.73	−0.41	−4.20	−2.56**	−2.28	−2.54**
	(2.90)	(0.70)	(3.56)	(1.07)	(1.47)	(1.20)
1 year	−7.54*	−4.22*	−8.12*	−4.46***	−6.72	−4.10**
	(4.07)	(2.19)	(4.89)	(1.61)	(5.06)	(1.64)
2 years	−6.97	−8.06	−6.96	−2.58	−4.66	−2.25
	(4.44)	(5.68)	(5.33)	(1.96)	(6.60)	(1.99)
3 years	−3.69	−7.89	−3.12	−2.29	−3.10	−2.02
	(3.36)	(8.16)	(3.69)	(1.91)	(4.35)	(2.07)
First-stage *F*	8.5	3.9	6.3	24.4	21.7	18.8
Obs.	856	207	649	1,552	422	1,130
			Panel C: Consumption			
On impact	6.39***	4.59	6.69**	1.63	−4.39	2.32*
	(2.47)	(4.33)	(2.90)	(1.12)	(3.84)	(1.19)
1 year	13.17***	7.98	13.98***	4.30**	−3.26**	5.62***
	(4.55)	(7.27)	(5.41)	(1.83)	(1.52)	(2.16)
2 years	14.27**	8.98	15.26*	4.07	−2.89	5.46*
	(6.68)	(8.17)	(8.18)	(2.48)	(2.38)	(2.95)
3 years	12.70	0.73	14.59	4.80	−4.33	6.30*
	(10.90)	(8.80)	(13.13)	(3.02)	(5.43)	(3.51)
First-stage *F*	9.6	5.0	7.2	24.4	13.9	19.3
Obs.	856	207	649	1,591	437	1,154

Notes: This table reports the response of the REER (Panel A), current account–to-GDP ratio (Panel B), and consumption, in percent, (Panel C) to an increase in g shock of 1 percent of GDP by trade openness using the baseline specification. A country is open if its total trade share in GDP exceeds 60 percent. The g shocks are constructed using military spending as an instrument for total government spending.

Table C9. Excluding Countries with Long Civil Wars

	Real Exchange Rate			*Current Account*			*Consumption*		
	All (1)	Adv (2)	Dev (3)	All (4)	Adv (5)	Dev (6)	All (7)	Adv (8)	Dev (9)
On impact	4.06***	−3.03	4.96***	−3.07***	−2.66*	−3.08**	2.05*	−2.54	2.45**
	(1.42)	(2.27)	(1.65)	(1.11)	(1.37)	(1.24)	(1.15)	(4.54)	(1.19)
1 year	4.84**	−3.88	6.01**	−4.92**	−8.39*	−4.44**	5.65**	−0.35	6.56***
	(2.02)	(3.73)	(2.36)	(1.57)	(4.93)	(1.60)	(1.88)	(2.35)	(2.16)
2 years	4.02	−5.03	5.35*	−2.92	−7.11	−2.32	6.00**	0.70	6.96**
	(2.47)	(4.62)	(2.89)	(1.90)	(6.84)	(1.88)	(2.66)	(3.17)	(3.08)
3 years	2.41	−9.47	4.04	−1.89	−5.54	−1.31	6.40**	−3.11	7.72**
	(3.12)	(6.79)	(3.50)	(1.79)	(5.17)	(1.86)	(3.25)	(6.48)	(3.71)
First-stage *F*	24.2	17.9	19.1	26.4	37.9	20.6	26.2	19.0	21.3
Obs.	2,101	623	1,478	2,132	609	1,523	2,162	624	1,538

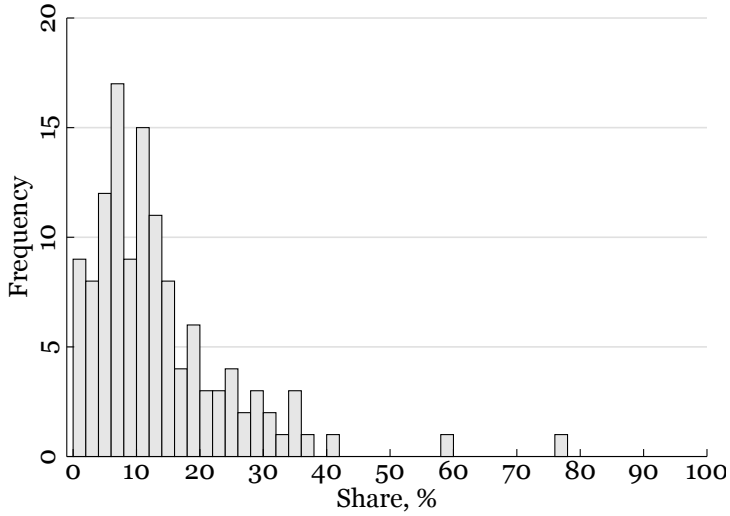
Notes: This table reports the response of the real exchange rate, current account–to-GDP ratio, and consumption (in percent) to an increase in g of 1 percent of GDP. The g shocks are constructed using military spending as an instrument for total government spending. We estimate the baseline specification for the sample excluding countries with at least 10 years of wars. These countries are Algeria, Burundi, Chad, Colombia, Ethiopia, India, Indonesia, Iran, Israel, Nepal, Peru, Pakistan, the Philippines, Russia, Rwanda, Sri Lanka, Thailand, Turkey, and Uganda. The results are similar to those from other specifications.

Table C10. Controlling for Financial Crises

	Real Exchange Rate			*Current Account*			*Consumption*		
	All	Adv	Dev	All	Adv	Dev	All	Adv	Dev
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
On impact	3.63***	−2.76*	4.66***	−2.69***	−2.06*	−2.77**	2.35**	−2.46	2.89**
	(1.30)	(1.68)	(1.55)	(1.02)	(1.19)	(1.17)	(1.06)	(3.26)	(1.15)
1 year	6.91**	−3.92	8.59**	−4.92**	−6.35	−4.72**	5.59**	−0.98	6.65***
	(2.56)	(2.82)	(3.06)	(1.50)	(4.18)	(1.61)	(1.75)	(1.94)	(2.04)
2 years	4.85*	−6.09*	6.69**	−3.26*	−5.27	−2.96	5.61**	−0.26	6.73**
	(2.48)	(3.67)	(2.95)	(1.80)	(5.42)	(1.90)	(2.41)	(2.70)	(2.84)
3 years	2.88	−10.71**	5.06	−2.32	−3.83	−2.01	5.48*	−3.09	6.88**
	(2.90)	(5.06)	(3.30)	(1.66)	(3.89)	(1.82)	(2.99)	(4.59)	(3.49)
First-stage *F*	30.7	18.5	23.5	32.5	31.3	24.5	32.6	19.9	25.6
Obs.	2,354	643	1,711	2,408	629	1,779	2,447	644	1,803

Notes: This table reports the response of the real exchange rate, current account–to-GDP ratio, and consumption (in percent) to an increase in g of 1 percent of GDP when we control for financial crises. The g shocks are constructed using military spending as an instrument for total government spending.

Figure C2. The Share of Arms Deliveries in Total Military Expenditure, 2002–2012



Notes: The distribution of the countries' mean shares. Data is from the U.S. Department of State's *World Military Expenditures and Arms Transfers (WMEAT) 2015*, 33rd edition, published in December 2015. The country sample is consistent with the baseline, excluding the Seychelles (data not available). The shares are computed from the individual series of imported arms deliveries and total military expenditures; values over 100 percent, which most likely represent the timing mismatch between the payment and the delivery, (about 2 percent of the initial number of observations) are dropped.

Table C11. List of Excluded Commodity Exporters

	Share of oil, metals >15% of GDP	Share of all exported commodities <50% of total exports	
Data source	UNCTAD (1)	Comtrade (2)	UNCTAD (3)
Algeria	XX		
Argentina			
Australia			
Azerbaijan			
Bahrain			
Bolivia			
Brunei			
Burkina Faso			
Burundi			
Cameroon			
Chad		X	
Chile	XX		
Colombia			
Côte d'Ivoire			
Ecuador			
Ghana			
Guyana			
Indonesia			O
Iran			
Kazakhstan			
Mali			
Mauritania	XX		
Mongolia			
Mozambique			
Nicaragua			O
Nigeria	XX		
Norway			
Oman	XX		
Papua New Guinea			
Paraguay			
Peru			
Russia	XX		
Saudi Arabia	XX		
Syria			
United Arab Emirates	XX	O	
Venezuela			
Yemen			
Zambia	XX		

Notes: This table lists countries with a share of commodities in total exports above 50 percent in a median year, according to at least one of the two data sources considered. These countries are excluded from the estimation sample in the robustness exercise reported in Table 3. In column (1), XX denotes countries that, in addition, have oil and metals exports above 15 percent of GDP, according to the UNCTAD data. In contrast, X indicates that the country has a share of commodities *below* 50 percent of total exports in the U.N. Comtrade database (column 2) or the UNCTAD (column 3), while O indicates missing data in the corresponding database. Countries without X or O markings have a share of commodities above 50 percent of total exports.

Table C12. Results Sensitivity to Exclusion of Large Commodity Exporters

	Real Exchange Rate			*Current Account*			*Consumption*		
	All	Adv	Dev	All	Adv	Dev	All	Adv	Dev
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
On impact	2.81**	−3.88**	3.68***	−2.15***	−2.43*	−2.12**	2.19**	−4.94**	3.00***
	(1.23)	(1.93)	(1.37)	(0.83)	(1.41)	(0.91)	(0.98)	(2.28)	(1.05)
1 year	7.10**	−5.55*	8.75**	−4.35**	−6.34	−4.12**	5.79**	−1.50	6.71***
	(2.61)	(3.16)	(3.01)	(1.45)	(5.15)	(1.48)	(1.58)	(2.54)	(1.76)
2 years	4.90**	−8.26**	6.70**	−3.52**	−6.57	−3.08**	5.07***	−2.11	6.08***
	(2.49)	(4.10)	(2.84)	(1.53)	(6.50)	(1.47)	(1.96)	(3.11)	(2.17)
3 years	3.28	−13.76**	5.34	−2.63*	−5.45	−2.15	3.13	−8.79**	4.51
	(3.00)	(6.58)	(3.26)	(1.56)	(5.16)	(1.60)	(2.62)	(3.77)	(2.88)
First-stage *F*	33.5	13.8	26.8	37.1	23.9	29.1	37.8	17.3	30.9
Obs.	2,234	631	1,603	2,283	617	1,666	2,331	634	1,697

Notes: This table reports robustness of the results to the exclusion of countries with oil and metals exports above 15 percent of GDP, according to the UNCTAD data. The excluded countries are marked by XX in Table C11.

Table C13. Robustness to Excluding Large Arms Importers: Alternative Cutoff (70 percent)

	Real Exchange Rate			*Current Account*			*Consumption*		
	All	Adv	Dev	All	Adv	Dev	All	Adv	Dev
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
On impact	4.29***	−5.17***	5.69***	−2.77**	−1.61	−2.91*	2.78**	−4.07	3.60**
	(1.55)	(1.83)	(1.85)	(1.35)	(1.44)	(1.52)	(1.30)	(2.79)	(1.49)
1 year	9.39**	−7.82**	11.96**	−5.01**	−1.49	−5.59**	7.55**	−1.88	8.72***
	(3.46)	(2.88)	(4.11)	(1.91)	(1.92)	(2.19)	(2.49)	(3.30)	(2.89)
2 years	6.46**	−11.50***	9.34***	−3.10	−0.18	−3.55	7.79**	−1.84	9.08**
	(2.97)	(3.62)	(3.53)	(2.33)	(2.73)	(2.68)	(3.58)	(4.51)	(4.19)
3 years	2.96	−18.19**	6.27*	−1.87	−1.03	−1.80	8.49**	−6.36*	10.34**
	(3.26)	(6.10)	(3.60)	(2.18)	(2.33)	(2.42)	(4.28)	(3.68)	(5.01)
First-stage *F*	20.5	30.8	16.2	21.2	31.6	16.8	22.6	14.0	18.3
Obs.	2,055	588	1,467	2,101	582	1,519	2,141	588	1,553

Notes: This table reports the response of the real exchange rate, current account–to-GDP ratio, and consumption (in percent) to an increase in g of 1 percent of GDP. We estimate the baseline specification for the sample of countries excluding countries that have at least one year with military spending over 70 percent on armed imports. These countries are Bahrain, Brunei, Cape Verde, Djibouti, Egypt, El Salvador, Georgia, Guyana, Kyrgyzstan, Laos, Luxembourg, Mauritius, Mongolia, the Seychelles, the United Arab Emirates, Uganda, and Venezuela.

Table C14. Robustness to Excluding Foreign Aid Recipients

	Real Exchange Rate			*Current Account*			*Consumption*		
	All	Adv	Dev	All	Adv	Dev	All	Adv	Dev
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
On impact	3.91***	−3.00*	5.30***	−3.49***	−2.04*	−3.78**	1.93	−2.60	2.64*
	(1.49)	(1.71)	(1.81)	(1.32)	(1.17)	(1.61)	(1.28)	(3.19)	(1.42)
1 year	7.21**	−4.18	9.70**	−6.13**	−6.18	−6.13**	5.70**	−1.33	7.37***
	(3.08)	(2.85)	(3.83)	(1.79)	(4.13)	(1.98)	(2.23)	(1.94)	(2.78)
2 years	4.43	−6.17*	6.89*	−3.77	−5.06	−3.47	6.65**	−0.75	8.62**
	(3.02)	(3.69)	(3.73)	(2.30)	(5.38)	(2.53)	(3.21)	(2.68)	(4.09)
3 years	1.83	−10.73**	4.67	−3.21*	−3.60	−3.02	7.55**	−3.70	10.04**
	(3.51)	(5.11)	(4.10)	(1.86)	(3.87)	(2.09)	(3.84)	(4.68)	(4.78)
First-stage *F*	22.1	19.1	15.8	23.5	32.3	16.5	23.5	20.6	17.2
Obs.	1,994	643	1,351	2,036	629	1,407	2,070	644	1,426

Notes: This table reports the response of the real exchange rate, current account–to-GDP ratio, and consumption (in percent) to an increase in g of 1 percent of GDP. The g shocks are constructed using military spending as an instrument for total government spending. We estimate the baseline specification dropping the countries identified as foreign aid recipients by Kraay (2012, table 1). The results are similar to other specifications.

Table C15. 1989–2007 Subsample

	Real Exchange Rate			*Current Account*			*Consumption*		
	All	Adv	Dev	All	Adv	Dev	All	Adv	Dev
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
On impact	3.95**	−5.60**	5.27**	−2.94**	−0.99	−3.17**	2.48*	−5.03	3.37**
	(1.80)	(2.68)	(2.12)	(1.35)	(2.16)	(1.53)	(1.40)	(4.61)	(1.55)
1 year	8.44**	−7.98*	10.75**	−5.37**	−8.60	−4.81**	7.13**	−1.82	8.32***
	(4.00)	(4.14)	(4.72)	(2.07)	(9.24)	(1.98)	(2.59)	(4.37)	(2.94)
2 years	4.87	−9.50*	7.00*	−2.81	−7.01	−2.11	6.29**	−2.58	7.54**
	(3.51)	(5.07)	(4.11)	(2.37)	(9.28)	(2.38)	(3.10)	(4.77)	(3.53)
3 years	2.94	−14.92**	5.61	−1.35	−4.64	−0.78	4.65	−4.86	5.85
	(3.74)	(5.55)	(4.33)	(1.92)	(4.76)	(2.12)	(3.53)	(7.41)	(3.98)
First-stage F	15.3	4.3	12.1	16.7	6.4	13.0	18.9	5.7	15.6
Obs.	1,671	470	1,201	1,747	456	1,291	1,779	473	1,306

Notes: This table reports the response of the real exchange rate, current account–to-GDP ratio, and consumption (in percent) to an increase in g of 1 percent of GDP. The g shocks are constructed using military spending as an instrument for total government spending. We estimate the baseline specification for the sample between 1989 and 2007. The results are similar to those from other specifications.