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Estimating the dynamics of fiscal financing in emerging economies

Krastina Dzhambova [a, *]

[a] *Department of Economics, College of Business and Economics, University of Wisconsin- Whitewater, Whitewater, USA*

ABSTRACT

I present a theoretical model and an empirical approach for jointly estimating the effectiveness of fiscal policy and the stochastic process of sovereign interest rate shocks. The theoretical model has features relevant to small open and emerging economies. Interest rate shocks affect the ability of firms to finance payroll expenses. This theoretical feature creates a propagation mechanism for interest rate shocks and affects government spending multipliers. This paper proposes a strategy for jointly estimating government spending multipliers and the interest rate shock process parameters.

KEYWORDS

Government spending multipliers; Small open economy; DSGE models; Government financing; Impulse response matching estimation

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* Corresponding author: Krastina Dzhambova
E-mail address: dzhambok@uww.edu

ISSN 2972-3272
doi: 10.58567/eal03010003

Received 13 July 2023; Accepted 17 August 2023; Available online 1 September 2023, Version of Record 15 March 2024

1. Introduction

In this paper, I propose a strategy for estimating the government financing rule for an emerging economy. The estimation uses structural VAR impulse responses to discipline a set of parameters. The remaining estimated parameters are obtained using model-based estimation. The parameters to be estimated can be split into two groups: those influencing the effectiveness of fiscal policy (i.e. the multiplier M_Y^G) and the parameters governing the financing of the exogenous stream of government consumption. The empirical response to interest rate shocks puts restrictions on the first group of parameters governing the size of the multiplier. The SVAR response to a government consumption shock estimated in Dzhambova (2021) can be used to obtain estimates of the fiscal policy rule. In this case, a natural estimation approach for the parameters not included in the SVAR is impulse response matching. I construct a Dynamic Stochastic General Equilibrium (DSGE) model with a role for both interest rate shocks and government consumption shocks.

Dzhambova (2021) highlights a few stylized facts. Government consumption expenditure decreases in response to an interest rate increase in emerging economies. Also, government consumption multipliers are lower for emerging economies. This paper focuses on the last stylized fact and aims to uncover the reasons for the lower multiplier. As revenue data for a panel of countries (particularly the emerging group) is hard to obtain, this paper emphasizes the use of model-based estimates of government financing.

One of the emphases in this paper is accounting for the feedback between the interest rate and domestic fundamentals as well as the feedback between government consumption and the interest rate. The estimation approach is in the spirit of Uribe and Yue (2006). Figure 1 is a stylized summary of their approach; using the estimated effect of domestic fundamentals on the interest rate, they obtain model-based estimates of the parameters governing the propagation of interest rate shocks. Figure 2 schematically shows my estimation approach. It builds on the intuition that the propagation of both an interest rate shock and a government consumption shock depends on the same groups of parameters. Using the approach in Uribe and Yue (2006), one can estimate the parameters governing both the propagation of interest rate shocks and the effectiveness of fiscal policy i.e. the fiscal multiplier. Estimating those parameters as the first stage allows the estimation of a lump sum financing rule in the second stage. Figure 3 summarizes the approach when taxes are distortionary.

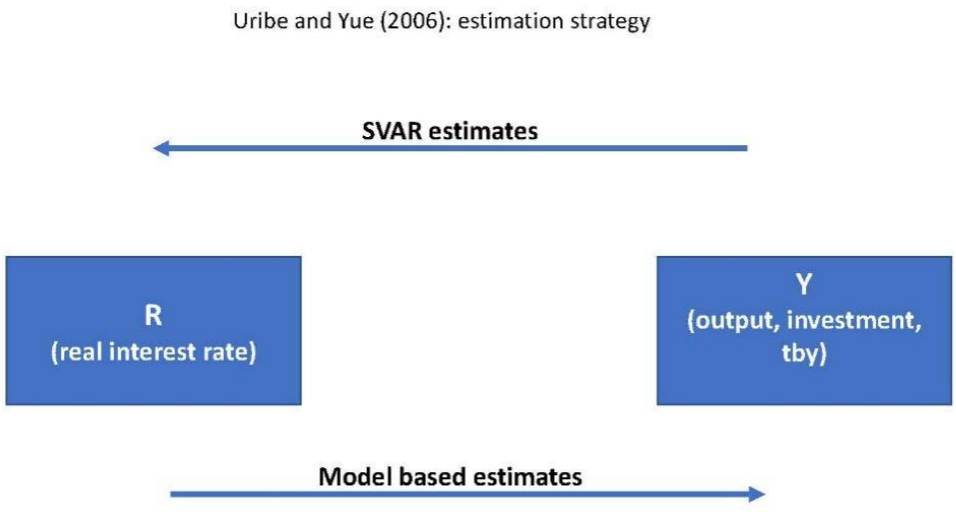

Figure 1. Schematic representation of the estimation approach in Uribe and Yue (2006).

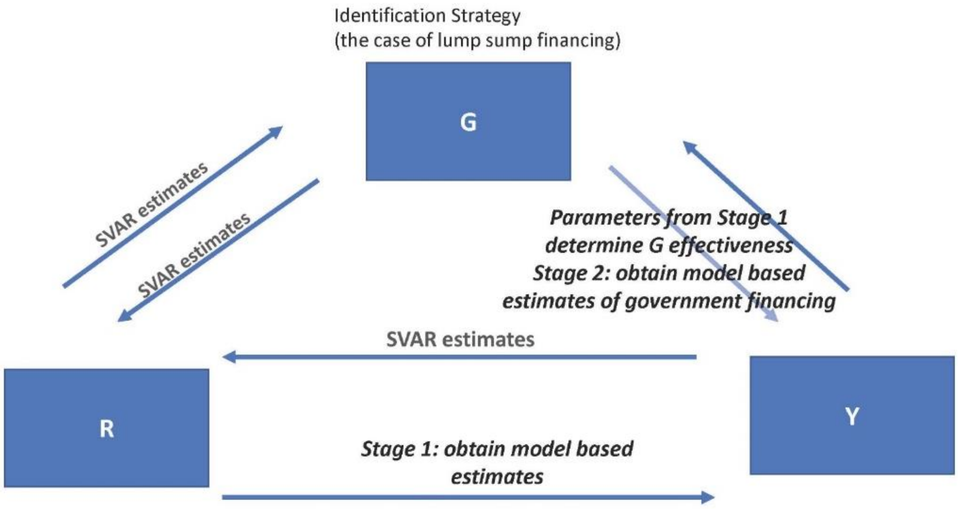

Figure 2. Schematic representation of proposed estimation strategy: the lump sum taxation case.

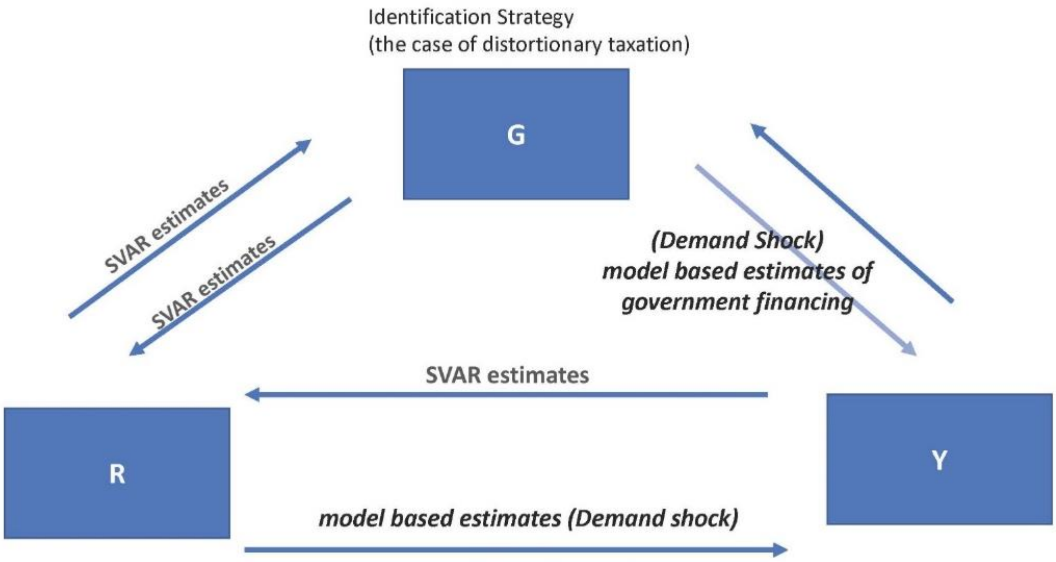

Figure 3. Schematic representation of proposed estimation strategy: distortionary taxation.

The theoretical literature has emphasized the mode of financing for how effective fiscal expansions are: for instance, Gali, Lopez-Salido, and Valles (2007) in a closed economy context and Garcia and Restrepo (2007) for a small open economy. Model-based estimates of fiscal policy rules for developed economies using Bayesian techniques exist: for example, Leeper, Plante, and Traum (2010) and references therein and Christoffel, Jaccard, and Kilponen (2011).

In the next section, I outline a stylized model which illustrates the interplay between fiscal policy effectiveness and the propagation mechanism for interest rate shocks. Both hinge on a countercyclical labor wedge in the labor market. In Section 3, I outline the DSGE model which would allow the proposed estimation approach. In Section 4, I discuss the parameters to be estimated and the estimation approach. I also report simulation results to illustrate the sensitivity of endogenous variables to these parameters.

2. Stylized Model

In this section, I adopt the stylized approach in Hall (2009) to demonstrate the key features of a small open economy model which can meaningfully propagate both interest rate and government consumption shocks. This allows me to narrow down the parameters which influence the effectiveness of fiscal policy in a small open economy.

I investigate two key model features: 1) opening the economy to trade in goods and financial assets and 2) counter-cyclical markups. The simulations reported below demonstrate that the first feature decreases the effectiveness of government consumption spending, and the latter increases it. In the small open economy case, a working capital constraint creates a counter-cyclical wedge which motivates the use of this model feature.

As in the closed economy model setting, counter-cyclical markups remove the trade-off between consumption and output. In the perfectly competitive, real business cycle model, a bigger decrease in consumption induces a bigger increase in the consumption-constant labor supply. In this case, a higher drop in consumption leads to a higher output multiplier. The opposite is true in a model which features a labor wedge distortion.

Figure 4 shows a stylized representation of this mechanism. The figure compares two versions of a closed economy real business cycle model. The two versions differ only by the existence of a labor wedge distortion. The upper left panel shows the labor market equilibrium in the perfectly competitive case. The lower left plot shows labor demand and the equilibrium in both the perfectly competitive case and the case with a labor wedge distortion present in the labor market. The two plots on the right show the response to a government spending shock in the perfectly competitive (upper plot) and the distortionary case (lower plot). Following standard practices in the DSGE literature, I offset the markup in the steady state which makes the steady states in the perfectly competitive model and in the model with distortions the same. However, outside the steady state, the markup decreases labor demand relative to the perfectly competitive case. The size of the wedge between the perfectly competitive labor demand and the one in the distortionary equilibrium varies counter-cyclically. For this reason, following a positive government consumption shock, the labor market equilibrium is different in the two versions of the model. In both versions of the model and under separable utility which I assume, the government spending multiplier is positive. In both cases, the behavior of labor supply is identical. In the perfectly competitive case, however, the increase in the equilibrium level of labor is solely due to the increase in labor supply. Higher output is the result of higher labor supply induced by the negative income/wealth effect due to the higher level of government consumption spending. The stronger the income effect, the higher the government spending multiplier on output. However, the fact that consumption must fall for output to increase guarantees that the government spending multiplier on output is less than 1. [1]

A counter-cyclical markup removes the trade-off between consumption and output. As illustrated in Figure 4, the labor wedge allows labor demand and the real wage to increase in response to a government consumption shock. As a positive aggregate demand shock increases labor demand in the distortionary case, it is possible for both consumption and output to increase in response to an increase in government consumption. This makes it possible for the government spending multiplier to increase above one. The stylized model specifics outlined below show that the size of the multiplier crucially depends on the parameter governing the markup countercyclicality.

The exposition throughout the paper follows the standard notation practice in the DSGE model literature. Letters with a t subscript denote realizations of the model variables at any given date. Letters without a subscript denote parameters and the realization of both endogenous and exogenous variables in the non-stochastic steady

[1] The argument applies to a model without capital accumulation. If there is capital accumulation, investment typically experiences crowding-out. It should be noted that the conclusions for the government spending multiplier still hold. See Hall (2009) for a more detailed discussion in the closed economy context.

state of the model. Variables with a hat denote linearization with respect to the non-stochastic steady state of the model.

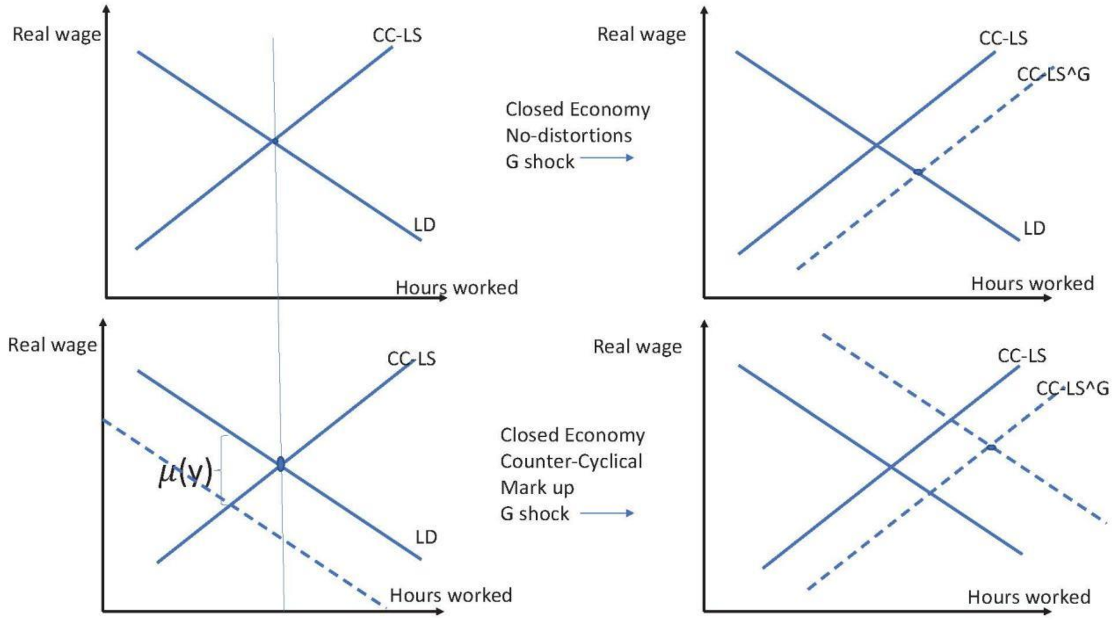

Figure 4. Schematic representation of the labor market in a closed economy model.

Notes: LD denotes labor demand, CC-LS denotes labor supply. Lower left panel: the dash line depicts labor demand in the case with distortions. $\mu(y)$ denotes the counter-cyclical labor wedge. Dashed lines on the right depict the position of labor demand and supply after an exogenous increase in government spending.

I assume for simplicity that production takes only labor and the α parameter governs the returns to scale in production. I also assume separable utility function, $u(c,h) = \frac{c^{1-\frac{1}{\sigma}}}{1-\frac{1}{\sigma}} - \gamma \frac{h^{1+\frac{1}{\psi}}}{1+\frac{1}{\psi}}$: $\mathcal{F}_h = \frac{1}{\psi} \equiv$ the inverse of the Frisch elasticity of labor supply, $\mathcal{F}_c = \frac{1}{\sigma} \equiv$ the inverse of the intertemporal elasticity of substitution.[2]

I assume market power and monopolistic markup which varies counter-cyclically: $P = \mu(y)C_y$ with $\mu(y) = y^{-\omega}$. P is the aggregated price level, C_y is the firm's marginal cost and $\mu(y)$ is the markup function which depends on output. The parameter ω governs the strength of countercyclicality. P, the aggregate price is normalized to 1.

The period budget constraint is $w_t h_t + \pi_t + b_t - Rb_{t-1} = c_t + g_t + \Psi(b_t)$. π_t are profits rebated to the household by the monopolistically competitive firm. Under perfect competition, $\pi_t = 0$. The household has access to a one-period real bond, b_t, with a known return R. The interest rate R is set on international markets and is exogenous. In the closed economy case, $b_t = b_{t-1} = 0$ in equilibrium.

First, I report simulations for the closed economy case. While the multiplier is strictly lower than 1 in the perfectly competitive case, for a sufficiently high markup elasticity in the case with a labor wedge, the multiplier can be higher than 1. For standard parameterization, an elasticity higher than 1.18 is required for the multiplier to be larger than 1 (figure 5). For $\omega = 0.5$, the multiplier is 0.75. This is not substantially different from the multiplier when $\omega = 0$, which is 0.63.

[2] For GHH preferences (commonly used in the SOE literature) $\frac{u_{hh}}{u_h}\hat{h} = \frac{u_c c}{u_c} c + \frac{1}{\psi}\hat{h}$ and the labor supply becomes: $\psi\hat{w} = \hat{h}$.

SEPARABE UTILITY				
Parameter:	Meaning	high omega	low omega	no mark up
gam	labor disutility weight	1.10		
xi	complemetarity (c and h)	-		
sigma	IES	0.50		
alpha	decreasing returns to labor	0.70		
psi	labor Frisch elasticity	1.90		
omega	mark up elasticity to output	1.18	0.50	0.00
m(dy/dg)	multiplier	1.00	0.75	0.63

Figure 5. Parameterization and implied parameter values in the closed economy stylized model.

Relaxing the closed economy assumption leads to two important differences. First, domestic absorption need not equal output and the consumption multiplier is not one minus the output multiplier. Second, up to a negligible equilibrium inducing portfolio adjustment cost ($\Psi(b_t)$), the household faces a perfectly elastic supply of loanable funds.

Figure 6 reports the impulse response to a unitary shock to government consumption for three different levels of the markup elasticity. For all three, output increases. However, in the absence of a labor wedge, the decrease in consumption which brings about the expansion in output is too large to be supported by empirical evidence. Increasing the markup elasticity decreases/reverses the decrease in consumption and the wage. In turn, the multiplier increases. Figure 7 compares the impulse response of consumption, hours worked, the wage, output and the multiplier M_G^Y to the same government consumption shock in the closed and in the small open economy case in the absence of a labor wedge. In terms of the signs of the impulse responses, the same logic transpires in the small open economy: consumption falls, which through the income effect leads to an increase in hours and output. The multiplier in the SOE case, however, is lower. The decrease in consumption is also smaller, approaching the empirical estimates (Hall (2009) reviews the empirical literature on the response of consumption to a government shock). Because the household can borrow from abroad, they can smooth consumption without increasing labor effort as much as in the closed economy counterpart. For a relatively smaller increase in labor effort, a much higher level of consumption is sustained in the SOE. In other words, part of the negative income effect is offset by international borrowing. For this reason, the fall in the real wage is also smaller.

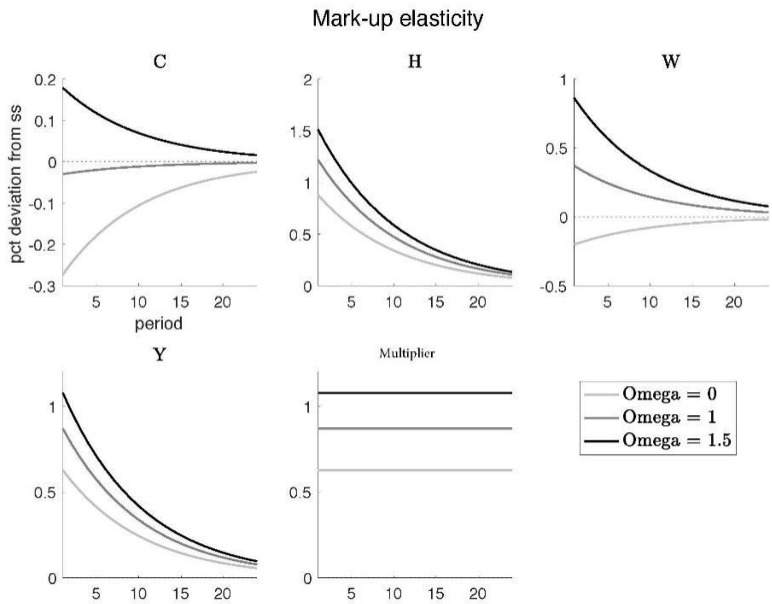

Figure 6. Impulse response to a government consumption shock in the closed economy.

Notes: Impulse response to a unitary government consumption shock for three different values of the parameter governing the markup countercyclicality. The impulse responses are for the following endogenous variables. "C": consumption, "H": hours worked, "W": the real wage, "Y": output and "Multiplier": the government spending multiplier.

NO MARK UP

	C	H	W	Y	MYG
	CLOSED ECONOMY				
impact	-0.27	0.88	-0.20	0.63	0.63
t=12	-0.11	0.34	-0.08	0.24	0.63
t=24	-0.02	0.08	-0.02	0.06	0.63
	OPEN ECONOMY				
	C	H	W	Y	MYG
impact	-0.08	0.26	-0.06	0.19	0.19
t=12	-0.07	0.25	-0.06	0.18	0.28
t=24	-0.06	0.22	-0.05	0.15	0.45

Figure 7. Impulse response to a government consumption shock in the closed economy and open economy.

Notes: Impulse response on impact, after 12 and after 24 quarters to a unitary government consumption shock for ω = 0 (the parameter governing the markup countercyclicality set to 0). The impulse responses are for the following endogenous variables. "C": consumption, "H": hours worked, "W": the real wage, "Y": output and "Multiplier": the government spending multiplier.

Figure 8 explores the effect of the elasticity of the labor wedge on the multiplier in the open and in the closed economy version of the model. For lower values of the markup counter-cyclicality ($\omega \leq 1.03$), the SOE multiplier is lower than the closed economy multiplier. This can be explained with the previous finding that the income effect induces a smaller increase in labor effort in the small open economy. As ω increases, the SOE multiplier approaches the closed economy multiplier. For $\omega \in (1.03, 1.04]$, the SOE multiplier surpasses the closed economy one.

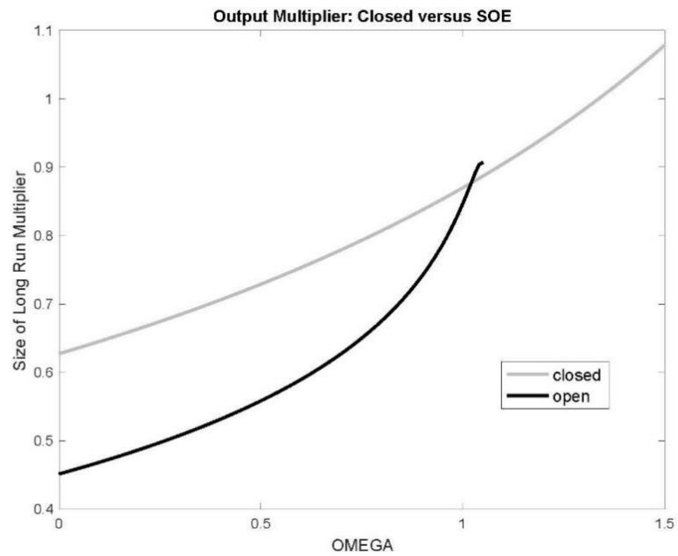

Figure 8. Government consumption shock: closed versus open economy long run multiplier.

Notes: Size of the long run government spending multiplier to a unitary government consumption shock for ω = 0 (the parameter governing the markup countercyclicality set to 0).

The stylized model suggests that a key model feature for the propagation of government consumption shocks is the behavior of the counter-cyclical labor wedge. Commonly, nominal rigidities would be responsible for generating the wedge.[3] Gali, Lopez-Salido, and Valles (2007) show that price rigidity increases the multiplier and dampens the decrease in consumption, but cannot alone lead to a multiplier higher than 1.

The propagation of interest rate shocks also depends on the parameters governing the labor wedge. Neumeyer and Perri (2005) introduce a working capital constraint for firms as a propagation mechanism for interest rate shocks. The working capital constraint itself introduces a labor wedge analogous to the labor wedge discussed above, which however depends on the interest rate:

$$\widehat{w}_t = \begin{cases} -\alpha\widehat{h}_t \text{ if } \eta = 0 \\ -\dfrac{\eta(\text{wedge})}{R}\widehat{R}_t^d - \alpha\widehat{h}_t \text{ if } \eta \neq 0 \end{cases}$$

where η is the fraction of the wage subject to the working capital constraint.[4] To the extent that output affects the interest rate, this leads again to a counter-cyclical wedge, which puts restrictions on how effective government spending is i.e. $\omega = \frac{\eta(\text{wedge})}{R}\epsilon_y^R$, ϵ_y^R is the elasticity of the interest rate to real output. Hevia (2014) estimates the cyclical behavior of a labor wedge (in addition to four other wedges) and shows that the wedges of the estimated prototype economy are consistent with a model with a working capital and a collateral constraint.

3. Model

I present a small open economy DSGE model with a public sector. The details of the model, first-order conditions of the household, the consumption and capital goods firms' optimization problems, government financing rule and aggregation are provided in the online appendix to the paper. [5] I summarize the key features of the model below.

The model features a borrowing constraint on the consumption good firm.[6] In keeping with the stylized model discussed in the previous section, the borrowing constraint introduces a countercyclical labor wedge. This provides a channel for the propagation of interest rate shocks. The interest rate on government borrowing is determined in international financial markets. It depends on fundamentals and is subject to unexpected, transitory shocks. This is in keeping with the small open economy literature emphasis on international borrowing conditions as one of the key drivers of business cycles in these economies.

The labor wedge also affects the effectiveness of government spending in stimulating output and consumption. In other words, and as discussed in the previous section, the countercyclical labor wedge affects the size of the multiplier. The firm's production technology also features a learning-by-doing externality.

There are two types of households: Ricardian and non-Ricardian. The Ricardian household has access to a one-period, internationally-traded, non-state-contingent bond while the non-Ricardian household has no financial means for consumption smoothing.

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[3] Bilbiie, Ghironi, and Melitz (2012) is an example of a real model in which counter-cyclical markups arise because of product creation.
[4] I provide more details on introducing the working capital constraint in the next section.
[5] Link to appendix:
https://www.dropbox.com/scl/fi/xrzqw412t3d1cah1ipayz/submission_economic_analysis_letters_online_appendix.docx?rlkey=a5lnn4ctq775fwohb8qu4psom&dl=0
[6] I follow seminal work by Neumeyer and Perri (2005) in introducing the working capital constraint in the next section.

A share of non-Ricardian households as a model feature is particularly relevant in the context of emerging economies as a non-negligible share of households having no access to financial markets is even more plausible for these economies. The model-based Bayesian estimation results on data from the Philippines reported by Mandelman (2013) put the mean value for the share of Non-Ricardian households at 62% with a plausible range between 42% and 90%. Using similar methodology, Barrail Halley (2017) reports even slightly higher estimates of this parameter on data for Mexico with the mean of the posterior distribution at 75%.

The model provides a flexible way to switch between distortionary and non-distortionary taxation by either setting the distortionary tax on capital, consumption and labor income to zero: $\tau_t^k = \tau_t^c = \tau_t = 0$ or by setting lump sum government transfers to the households which can be either positive or negative to 0. While more realistic, distortionary taxation increases the number of parameters to be estimated. Additionally, it might be impossible to identify those without data on individual tax revenue components. Leeper, Plante, and Traum (2010) provide estimates of the tax rates shocks' cross-correlation matrix ρ based on the US (see online appendix[7] for explicit definitions of the fiscal financing rules and shocks).

The specified model does not feature any nominal frictions as I have aimed to specify as stylized a model as possible. A model with nominal frictions as in Gertler, Gilchrist, and Natalucci (2007) and Mandelman (2013) would also introduce a counter-cyclical labor wedge and make the economy sensitive to both interest rate fluctuations and government consumption spending. The challenge in this setting is specifying a realistic monetary policy rule for an emerging economy. Mandelman (2013) estimates a small open economy model on data from the Philippines with Bayesian methods and obtains estimates for an open economy version of the Taylor rule which smooths the nominal interest rate, inflation, the nominal exchange rate, and the output gap.

4. Estimation Strategy

There are 10 parameters of interest: $\theta = [\eta\ \phi\ \kappa\ \zeta\ Z_g\ Z_{rev}\ \Xi_g\ \Xi_{rev}\ \rho_{gg}\ \rho_{rev}]$ in the lump sum taxation case. η is the fraction of the wage subject to a working capital constraint, ϕ is capital adjustment cost, κ is the fraction of non-Ricardian consumers, ζ governs the importance of the learning by doing externality in the production function, Z and Ξ are the response of fiscal variable to output and debt and ρ is the autocorrelation of fiscal variables. The parameter space can be further reduced if the SVAR estimates for $[Z_g\ \rho_{gg}]$ are used and the shocks to revenue are eliminated. Then the parameters to be estimated are: $\theta = [\eta\ \phi\ \kappa\ \zeta\ Z_{rev}\ \Xi_g\ \Xi_{rev}]$. An estimation approach which utilizes the impulse responses obtained in Dzhambova (2021) performs an impulse response matching exercise as in Garcia-Cicco and Kawamura (2015), Uribe and Yue (2006) among others. In this exercise, θ minimizes the following criterion:

$$min_{\hat{\theta}}\left[IR^e - IR^m(\hat{\theta})\right]' \Sigma_{IR^e}^{-1}\left[IR^e - IR^m(\hat{\theta})\right]$$

where IR^e are the estimated impulse responses and $R^m(\theta)$ are the model generated responses.

Figure 2 schematically shows how θ can be estimated. It builds on the intuition that the propagation of both an interest rate shock and a government consumption shock depends on the same groups of parameters. Using the approach in Uribe and Yue (2006) shown in Figure 1, one can estimate the parameters governing both the

[7] Link to online appendix: https://www.dropbox.com/scl/fi/xrzqw412t3d1cah1ipayz/submission_economic_analysis_letters_online_appendix.docx?rlkey=a5lnn4ctq775fwohb8qu4psom&dl=0

propagation of interest rate shocks and the effectiveness of fiscal policy i.e. the fiscal multiplier. Estimating those parameters as the first stage allows the estimation of a lump sum financing rule in the second stage. Figure 3 summarizes the approach when taxes are distortionary. The lump sum financing rule as well as the distortionary taxation case are defined in the online appendix to the paper. [8]

In the next paragraph, I discuss data sources and implementation strategy. The rest of the section illustrates the key features of the model and how they relate to the estimation approach. [9]

The first stage of the proposed estimation depends on the identification of interest rate shocks in a VAR setting. The second stage uses the impulse response from an identified government consumption shock. While there are multiple VAR identification strategies applicable in this context, Dzhambova (2021) offers the identification of both types of shocks and an application to emerging economies. Dzhambova (2021) uses contemporaneous timing restrictions to identify both shocks. The paper compiles a quarterly dataset covering a group of emerging economies. The same data sources are applicable in the current setting for the two-stage estimation. The International Financial Statistics from the International Monetary Fund (IMF IFS) provide time-series data on quarterly government consumption expenditure, output, investment, and net exports as well as GDP deflators. To identify interest rate shocks, the J.P. Morgan Emerging Market Bond Index Plus (EMBI+) can be used as a measure of external borrowing costs. The index measures the sovereign cost of borrowing on international markets. The indices include internationally traded government debt instruments across maturities. These data sources can be used to apply the proposed identification strategy.

Figure 9 reports the impulse response to an interest rate shock with and without a working capital constraint. In both cases the interest rate shock is contractionary. Due to the wealth effect, consumption, investment and output decrease. In the absence of a working capital constraint, the impact response of labor demand is nil. In the following periods, depressed demand reduces output, the real wage and hours worked. Once the working capital constraint is imposed, setting $\eta = 0.5$, labor demand responds on impact. The overall response of labor demand is magnified. This leads the response of consumption to the interest rate shock to more than double relative to the case when $\eta = 0$. Due to the capital adjustment costs, η has little bearing on the response of investment and the trade balance. Figure 10 reports the impulse responses to a range of values for η.

The exercise illustrates the importance of η for the magnitude of the response of output. Whether the labor wedge introduced through a working capital constraint can respond to government consumption shocks depends on the strength of the feedback from output to the real rate. Figure 12 reports the impulse responses to an interest rate shock with and without feedback from fundamentals to the real rate. Although the feedback increases the overall sensitivity of the model variables to an interest rate shock, the overall difference is admittedly small.

Figure 11 shows the impulse response of the model variables to an interest rate shock under different parameter values for capital adjustment costs (ϕ). The exercise is instructive in terms of the household's ability to adjust consumption and investment in the face of a wealth shock. When capital adjustment costs are high, most of the variation is absorbed by the adjustment cost itself. Outside of the trade balance and investment, Φ matters for the convergence of output and consumption.

[8] Link to online appendix:
https://www.dropbox.com/scl/fi/xrzqw412t3d1cah1ipayz/submission_economic_analysis_letters_online_appendix.docx?rlkey=a5lnn4ctq775fwohb8qu4psom&dl=0

[9] For the impulse response analysis, I have set $\kappa = 0$ and introduced preferences with external habit formation (Abel (1990)). The feature is described in the online appendix to the paper.

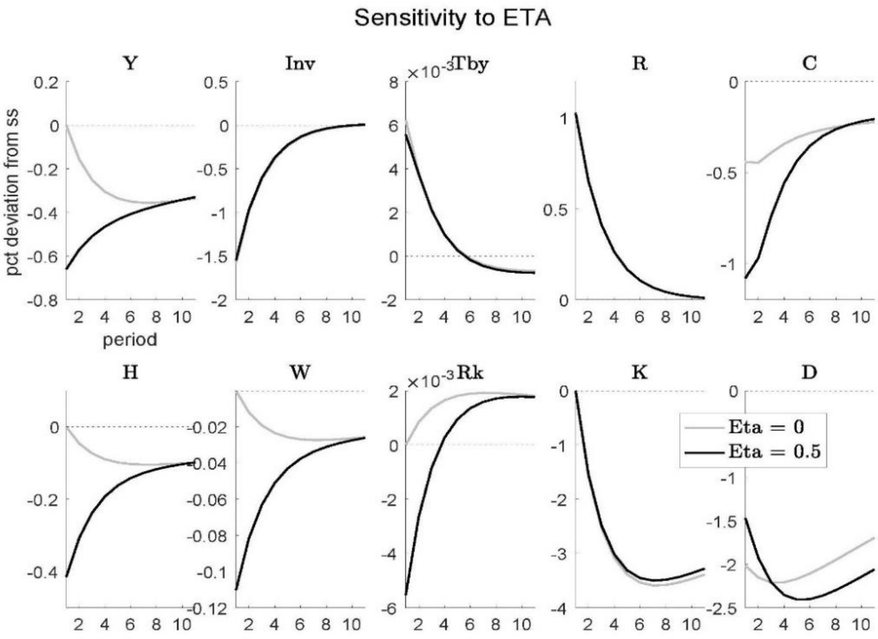

Figure 9. Introducing a working capital constraint.

Notes: Impulse response to a unitary interest rate shock with (η = 0.5) and without (η = 0) a working capital constraint. The impulse responses are for the following endogenous variables. "C": consumption, "H": hours worked, "W": the real wage, "Y": output and "Inv": investment, "Tby": trade balance, "R": the real interest rate on gov. debt, "Rk": return on capital, "K": the capital stock, "D": stock of gov. debt.

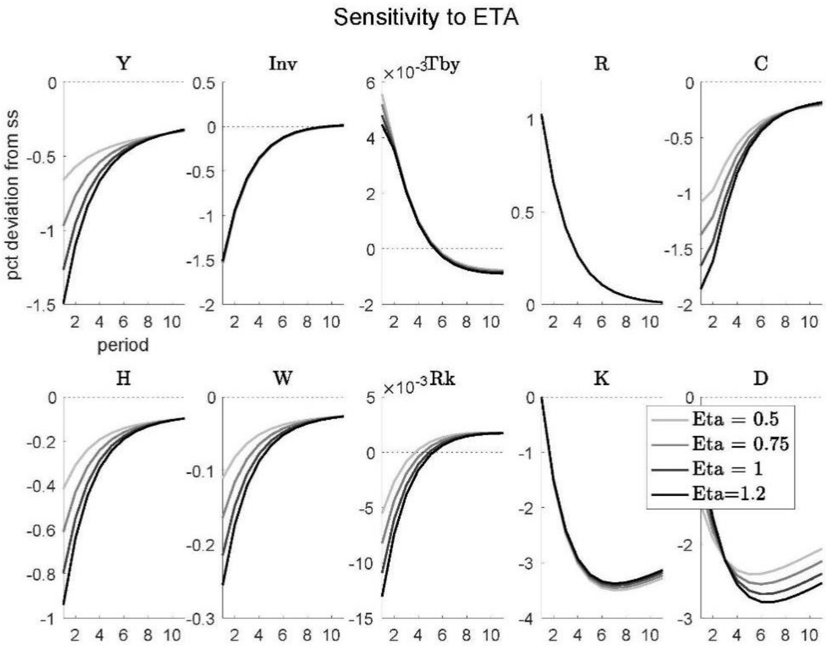

Figure 10. Parameter Sensitivity.

Notes: Impulse response to a unitary interest rate shock for four different levels of η. The impulse responses are for the following endogenous variables. "C": consumption, "H": hours worked, "W": the real wage, "Y": output and "Inv": investment, "Tby": trade balance, "R": the real interest rate on gov. debt, "Rk": return on capital, "K": the capital stock, "D": stock of gov. debt.

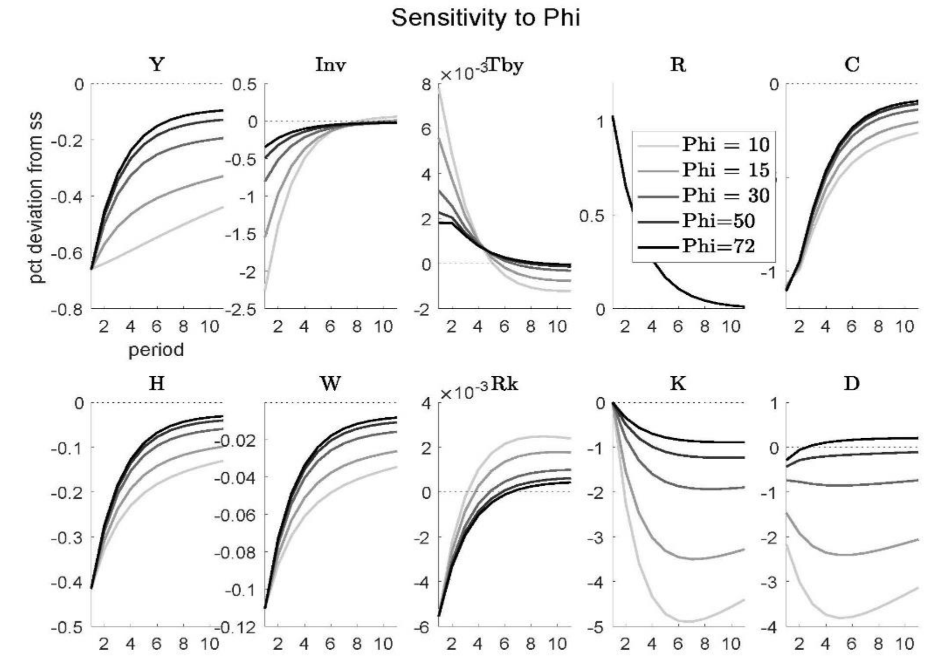

Figure 11. Parameter Sensitivity.

Notes: Impulse response to a unitary interest rate shock under different parameter values for capital adjustment costs (ϕ). The impulse responses are for the following endogenous variables. "C": consumption, "H": hours worked, "W": the real wage, "Y": output and "Inv": investment, "Tby": trade balance, "R": the real interest rate on gov. debt, "Rk": return on capital, "K": the capital stock, "D": stock of gov. debt.

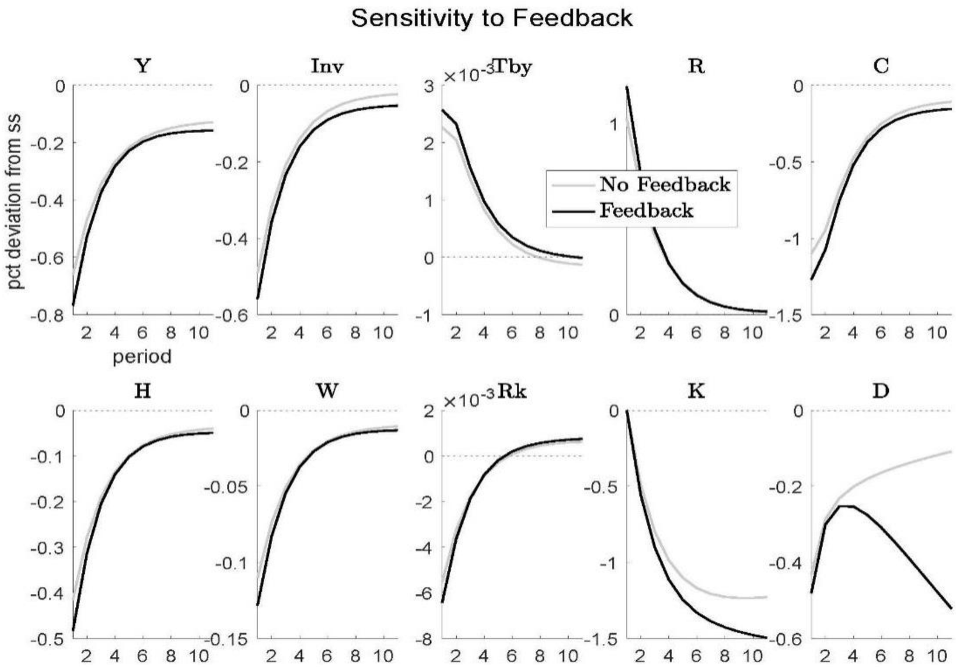

Figure 12. Parameter Sensitivity.

Notes: Impulse response to a unitary interest rate shock with feedback and without feedback from fundamentals to the interest rate. The impulse responses are for the following endogenous variables. "C": consumption, "H": hours worked, "W": the real wage, "Y": output and "Inv": investment, "Tby": trade balance, "R": the real interest rate on gov. debt, "Rk": return on capital, "K": the capital stock, "D": stock of gov. debt.

5. Conclusion

I present a theoretical model which shows that the effectiveness of fiscal policy depends on parameters governing the response of the economy to interest rate shocks. I propose an estimation strategy that exploits this interplay. Obtaining estimates of the government financing rule for emerging economies will allow the construction of counterfactual government consumption multipliers under alternative financing rules. Such counterfactual exercises will shed light on how much debt intolerance, a term coined by Reinhart, Rogoff, and Savastano (2003), limits the scope of fiscal policy in emerging economies. Counterfactual financing can also quantify the effect on aggregate volatility and the welfare implications of alternative financing rules.

Funding Statement

This research received no external funding.

Acknowledgments

I am grateful to my colleagues at the University of Wisconsin- Whitewater for helpful comments and suggestions.

Conflict of interest

The author claims that the manuscript is completely original. The author also declares no conflict of interest

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