



Optimal fiscal policy and different degrees of access to international capital markets[☆]



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ABSTRACT

Empirically, the cyclical pattern of fiscal policy differs between developed and developing countries, with in particular much greater pro-cyclicality and volatility of public investment in developing countries. In this paper I provide a theoretical explanation for the observed differences by analyzing optimal fiscal policy under different degrees of access to world capital markets. If the supply of foreign capital is elastic, as in a developed country, then it is optimal to adjust to an adverse external shock by borrowing from abroad to finance public expenditure and cutting taxes to smooth private consumption. If the supply of foreign capital is inelastic, however, as in a developing country, the optimal adjustment policy is to reduce public investment (by much more than public consumption) and to raise consumption taxes.

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1. Introduction

Empirical studies of the cyclical behavior of fiscal variables have consistently found notable differences between developed and developing countries, especially in the pattern of total government expenditure, which tends to be counter-cyclical in the former and pro-cyclical in the latter group of countries (Kaminsky et al., 2005 and the references therein). A first contribution of this paper, using data on G-7 and Latin American countries, is to confirm these earlier

results and to sharpen them by distinguishing between public consumption and public investment. I show that both public investment and public consumption are pro-cyclical in countries at all levels of development, but are more strongly so in developing countries.¹ I also show that public investment is more volatile (and more procyclical) than public consumption, and that the volatility of public investment is far greater in developing than in developed countries.

The main contribution of this paper, however, is to provide a theoretical explanation, in the framework of optimal fiscal policy, for these empirical differences. I construct a DSGE model of a small open economy that earns stochastic revenue from exporting natural resources and whose government seeks to maximize the well-being of its citizens in the face of shocks to its resource revenues through its choices concerning four policy instruments: public consumption, public investment, a tax on private consumption, and foreign borrowing. I then show how the optimal policy response to shocks depends on the country's conditions of access to world capital markets, and that differences in capital market access generate differences in policy

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¹ This is consistent with findings of Ilzetzki and Végh (2008).

choices that are consistent with the observed regularities in the cyclical behavior of fiscal policy in developed and developing countries. The model assumes that developed countries have unlimited access to borrowing at a given world interest rate, whereas developing countries face borrowing constraints. These constraints are modeled through a country-specific risk premium that increases with the stock of debt issued. The private sector, which derives income from an endowment of labor and private capital, is assumed not to have access to world capital markets, so that there is a role for the government in smoothing private sector consumption. The benchmark specification of the model assumes that taxes are distortionary, but I unpick the forces that drive policy choices by also analyzing what the optimal solution would be with non-distortionary lump-sum taxes. Public consumption is assumed to provide utility directly to private households. Public capital is treated as an input to the economy's production, and public investment each period adds to the stock of public capital inherited from the previous period.

Simulations of the benchmark model identify the following effects of differing access to international capital markets on the fiscal policy response to an adverse external shock to government's revenues. In developed countries, it is optimal to borrow heavily from abroad to protect public expenditure and to reduce taxes to protect private consumption, so that both private consumption and public expenditure are more smoothed. In contrast, in developing countries the higher cost of using external finance to smooth shocks makes it optimal for more of the adjustment to be internal – that is, by reducing public expenditure and raising taxes. Most of the adjustment is of public expenditure, since increasing taxes causes large intertemporal distortions and affects the private consumption directly. Most of the public expenditure adjustment, moreover, is of public investment rather than of public consumption. This is because cuts in public consumption affect consumer utility directly and immediately, while cuts in public investment affect utility only indirectly, by reducing both the return on private capital and the marginal product of labor, and the effects of public spending cuts on consumer utility are spread over multiple periods of time as capital depreciates over time. There is a simple intuitive interpretation of these differences in policy responses between developed and developing countries.² The optimal response to an adverse shock usually includes some sort of borrowing. Developed countries borrow from international capital markets. For developing countries, access to the world capital markets is more costly. They therefore reduce public investment, which is akin to borrowing from the future.

Changes in tax rates usually also play an important role in the optimal policy response to an external shock, and simulations of the model shed light on their nature and determinants. I find that for a lower intertemporal elasticity of substitution, a more elastic labor supply, and a higher degree of persistence of the shock, the optimal dynamic path of tax rates is hump-shaped, when countries face external borrowing constraints, and the optimal cut in the tax rate is larger if the supply of foreign capital is elastic. The intuition for these results is as follows. Lower consumption taxes (or an only moderate increase) today provide a boost to consumers' income and stimulate private investment. Unable to borrow externally, consumers use investment as a means of saving today's increase in income for tomorrow, when tax rates will be higher, and thus smooth their consumption. But how governments implement this tax policy depends on their degree of access to international capital markets. A government with unlimited access to external funds at a given world interest rate is able to stimulate private smoothing by offering tax cuts. If its access to external borrowing is limited, however, the government must initially raise tax rates by less, and increase them again later, generating hump-shaped path of tax rates.

The model sheds light also on the risk-mitigating role of governments in the face of external fluctuations such as terms of trade when

the private sector lacks access to insurance markets (a development issue studied earlier by for example Bates et al. (1991) and Rodrik (1998)). I extend the benchmark specification of the model by assuming that the negative resource revenue shock also adversely affects the productivity of the private sector. In this case, the productivity shock directly cuts private sector income and hence dominates the effects of the government resource revenue shock, thereby creating an insurance role for the planner. The degree of insurance that governments can provide, however, is larger in developed countries, because of their unlimited access to international capital markets, than in developing countries. An elastic supply of external funds enables developed countries to cut taxes (by more than in the case of the resource shock alone) and promote private consumption smoothing. By contrast, governments in developing countries cannot afford to borrow externally to finance tax cuts that are big enough to smooth private consumption.

By estimating a partially identified structural VAR, similar to Pieschacón (2012), for one commodity-exporting developing country, Colombia, I compare VAR-based impulse responses with the ones implied by the model. The model successfully predicts the observed magnitudes of responses to shocks and confirms the crucial shock-absorbing role of public investment. The model is less successful in capturing the hump-shaped responses of both public investment and public consumption. Including additional features, such as the time-to-build process of public investment (Leduc and Wilson, 2012; Leeper et al., 2010), might help to remedy this shortcoming, though it could also alter the optimal path of tax rates. There is thus scope for future research to improve on the present model and to bring it closer to the data, as well as a need for more empirical evidence from developing countries on the roles of public investment and tax rates in fiscal policy.

The paper proceeds as follows. Section 2 presents the main empirical observations regarding the behavior of public investment and government consumption over the business cycle in high income countries and in Latin American developing countries. Section 3 describes and solves the Ramsey problem. Section 4 calibrates the model and presents the impulse responses of the main variables of interest, then discusses the baseline results. It goes on to analyze (a) how optimal policy choices would differ if non-distorting lump-sum taxes were available, and (b) the consequences of an adverse resource revenue shock being associated with a drop in private sector productivity. In Section 5, I examine the sensitivity of the baseline results to variation in the intertemporal elasticity of substitution, the labor supply elasticity, and the degree of persistence of the resource revenue shock. Section 6 concludes.

2. Empirical evidence

This section presents the main empirical observations regarding the behavior of the public sector over the economic cycle in commodity-exporting developing countries. I start by reporting the business cycle properties of fiscal policy in a sample of Latin American developing countries and comparing them with a sample of developed countries. Next, I use a vector autoregression (VAR) to evaluate the effects of commodity prices on the main fiscal variables of interest in one commodity-exporting country, Colombia.

2.1. Stylized facts

In this section I revisit the evidence on the cyclicity of fiscal policy for a sample of high-income countries and Latin American developing countries.³ I document the business cycle properties of

² I am indebted to a referee for this point.

³ There is a large literature documenting the fact that government expenditure is counter-cyclical in developed countries, but pro-cyclical in developing countries (e.g., Kaminsky et al. 2005). Ilzetzki and Végh (2008) document the cyclical properties of several components of government spending, and in particular of public consumption and public investment.

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