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Optimal fiscal policy in a small open economy with limited commitment

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ABSTRACT

We introduce limited commitment into a standard optimal fiscal policy model in small open economies. We consider the problem of a benevolent government that signs a risk-sharing contract with the rest of the world, and that has to choose optimally distortionary taxes on labor income, domestic debt and international transfers. Both the home country and the rest of the world may have limited commitment, which means that they can leave the contract if they find it convenient. The contract is designed so that, at any point in time, neither party has incentives to exit. We define a small open emerging economy as an economy where the limited commitment problem is active in equilibrium. Conversely, a small open developed economy is an economy in which the commitment problem is not active. Our model is able to rationalize some stylized facts about fiscal policy in emerging economies: i) the volatility of tax revenues over GDP is higher in emerging economies than in developed ones; ii) fiscal policy is procyclical in emerging economies; iii) emerging economies may "graduate" from procyclical fiscal policy and adopt countercyclical policies in the long run.

1. Introduction

The international evidence on tax revenues suggests that tax revenues over GDP are more volatile in small open emerging than in small open developed economies: Fig. 1 shows the coefficient of variation of tax revenues over GDP for 28 developed economies (in red) and 25 emerging economies (in blue) for the period 1997–2009.[1] From this figure, we can conclude that the coefficient of variation of tax revenues over GDP in small open emerging economies almost doubles that of small open developed economies.[2,3]

Moreover, small open emerging economies tend to display procyclical fiscal policy. The fact that government expenditure appears to be procyclical in emerging economies, whereas it is countercyclical or acyclical in developed economies, has been well documented in the literature.[4] In addition, in a recent paper, Vegh and Vuletin (2012) construct a novel dataset on tax rates for a large set of countries and a long time span. They find that tax policy is acyclical in industrial countries but procyclical in developing countries. A second finding of Vegh and Vuletin (2012), in line with the evidence presented before, is that tax rates are more volatile in developing than in industrial countries.[5]

In this paper we develop a model of optimal fiscal policy for a small open economy that is able to rationalize the previous set of facts. To this end, we introduce limited commitment in a model of international risk

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[1] Small open emerging economies are defined as economies for which the EMBIG spread of JP Morgan is computed. Conversely, small open developed economies are economies that belong to the OECD and that do not pertain to the former group. We have also discarded the U.S. for being a large economy. Details on the data sources can be found in Appendix B.1 (available from the author's website).

[2] The mean for small open emerging economies is 11.14%, while in small open developed economies it is 5.6%.

[3] In addition, we find a positive correlation between the volatility of tax revenues over GDP and the EMBIG spread. In Appendix B.2 (available from the author's website) we explore this evidence more in depth and find that this correlation is positive and statistically significant even when controlling for the volatility of GDP or of government expenditure. We interpret the EMBIG spread, which is a measure of country risk premium, as a degree of the lack of commitment that the country has towards foreign sovereign obligations. Then, countries with more volatile series of tax revenues over GDP are countries with worse commitment problems towards its foreign sovereign debt.

[4] Examples of papers that deal with this issue are Gavin and Perotti (1997), Talvi and Vegh (2005), Kaminsky et al. (2004) and Ilzetzki and Vegh (2008). For a careful review of this literature, see Cuadra et al. (2010).

[5] When analyzing the correlation between the cyclical component of GDP and that of a tax index that comprises the personal income, corporate income and value added tax rates, the authors find that for industrial countries this correlation is evenly distributed between positive and negative values, thus suggesting that, on average, fiscal policy is acyclical for this group of countries. Conversely, the group of developing countries displays twice as many negative correlations (procyclical fiscal policy) than positive ones (countercyclical fiscal policy). Panel regression analyses, even when controlling for possible endogeneity issues, confirm this result. When regressing the cyclical component of the tax index on the cyclical component of GDP, the coefficient for industrial economies is non-significant, while for developing economies it is negative and statistically significant. This finding is supported by Cuadra et al. (2010), who provide anecdotal evidence on several episodes that suggests that in emerging countries tax rates behave according to a procyclical fiscal policy plan.

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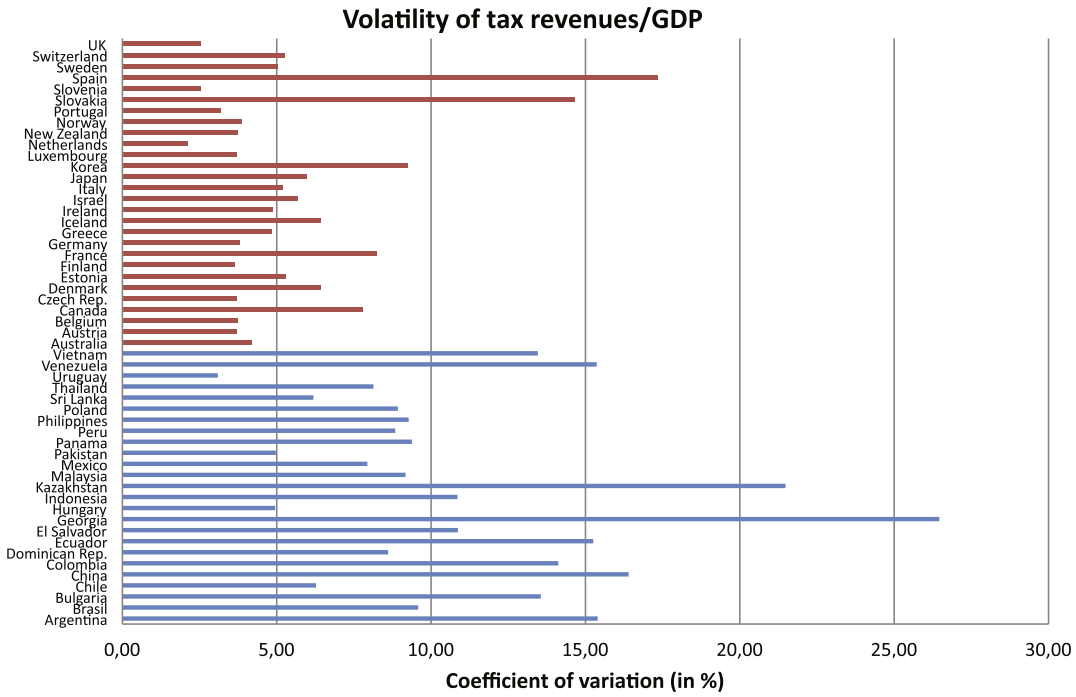

Fig. 1. Volatility of tax revenues for emerging and developed countries.

sharing *à la* Marcet and Marimon (1992) and Kehoe and Perri (2002), where countries set their fiscal policy in a Ramsey fashion. We define a small open emerging economy as an economy that has entered the international financial market but that may have incentives to default on its foreign obligations at some states of nature. Conversely, a developed economy is an economy that never has incentives to default on its foreign obligations. Our quantitative exercise shows that our calibrated emerging economy has more volatile tax revenues over GDP than the corresponding developed economy and that fiscal policy is procyclical.[6] Moreover, we show that, as the economy transits from being emerging to being more developed, it displays less volatile tax revenues over GDP and countercyclical fiscal policy, and thus it *graduates* from procyclical fiscal policy (Frankel et al., 2013).

We assume that the world economy is composed of two countries: the home country and the rest of the world. The home country is populated by risk averse households. There is a fiscal authority that has to finance an exogenous public expenditure stream either through distortionary labor income taxes, by issuance of domestic debt, or by contracting transfers with the rest of the world. There are two possible sources of uncertainty in this economy, given by a government expenditure shock and a productivity shock. The rest of the world is inhabited by risk-neutral agents. A contract, signed by the two countries, regulates international risk-sharing. We assume that, when a country enters this contract, it has limited commitment, which implies that the country will terminate the contract if, for some state of nature, its given outside option is more attractive than the continuation value of honoring the contract. Consequently, the contract needs to specify participation constraints for the home country and the rest of the world that define adjustments in the allocations necessary to rule out default in equilibrium.

The presence of limited commitment lessens international risk sharing among countries. When a negative shock hits the home country, an international risk-sharing contract specifies that the rest of the world, in its role of providing insurance, transfers resources to the home country. However, when the negative shock is large, these transfers are diminished due to limited commitment. In consequence, a fraction of government expenditure has to be absorbed by tax revenues, and this fraction increases, the stronger the commitment problem is. Similarly, the contract specifies that a positive shock should be accompanied by a transfer from the home country to the rest of the world. Once again, limited commitment restricts the size of the transfer and this, in turn, alleviates the need to collect tax revenues.

We test the qualitative and quantitative implications of this mechanism by calibrating the model to the Mexican economy. Our simulation results show that, in the short run, a small open emerging economy subject to productivity shocks displays procyclical fiscal policy (countercyclical tax rates) and a volatility of tax revenues over GDP consistent with the data for emerging economies of Fig. 1. These results are solely due to the presence of limited commitment: if it is assumed that the economy has full commitment, fiscal policy is countercyclical and tax revenues over GDP are much less volatile. This latter economy corresponds to our definition of a developed economy.

In addition, the previous exercise allows us to assess the validity of our definition of a small open emerging economy. To this end, we compute moments of the simulated economy and compare them to moments of the data. The model replicates well three distinctive characteristics of business cycles in emerging economies: the higher volatility of consumption relative to output, a trade balance that is more countercyclical than in developed economies, and a countercyclical real interest rate.[7] On the contrary, a simulated developed economy presents none of the characteristics previously listed, as in this case consumption is constant while output is volatile, the trade balance is strongly procyclical and the real interest rate is acyclical.

The results described so far are obtained by simulating the model in the short run. In models of limited commitment, the short run is

[6] In terms of the model, the volatility of tax revenues over GDP is equal to the volatility of labor tax rates.

[7] See Neumeyer and Perri (2005), Aguiar and Gopinath (2007), Garcia-Cicco et al. (2010), Boz et al. (2011) and Mendoza and Yue (2012), among others, for a characterization of business cycles in emerging economies.