Financial development, institutional quality and maximizing-growth trade-off in government finance

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A B S T R A C T

This paper studies monetary and fiscal policies in an endogenous growth model with transaction costs. We show that the relation between long-run economic growth and both monetary and fiscal policies is subject to threshold effects, a result that gives account of a number of recent empirical findings. Furthermore, the model shows that, to finance public expenditures, growth-maximizing governments must choose relatively high seigniorage (respectively income taxation), if "institutional quality" and "financial development" indicators are low (respectively high). Thus, our model may explain why some governments resort to seigniorage and inflationary finance, and others rather resort to high tax rates, as a result of growth-maximizing strategies in different structural environments (notably concerning institutional and financial development contexts). In addition, the model allows examining how the optimal mix of government finance changes in response to different public debt contexts. A short empirical section confirms our theoretical results.

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1. Introduction

The impact of monetary and fiscal policies on long-run economic growth is an open issue of macroeconomic theory. Concerning fiscal policy, standard endogenous growth models show the existence of a threshold in the tax rate to long-run growth relation, in link with the pioneer work of Barro (1990). In his model, productive public expenditures are financed by a flat-tax rate on output. A higher tax rate reduces the marginal net-of-taxes return of private capital, but also provides resources for public expenditures that enhance private capital productivity. Thus, one can find a tax rate that solves this trade-off and maximizes long-run economic growth. Concerning monetary policy, most of exogenous growth or endogenous growth models conclude to some neutrality or "superneutrality" of money in steady-state,[1] with the notable exception of Stockman (1981) and Palivos and Yip (1995) cash-in-advance model, in which a money expansion reduces steady-state levels of capital and output, when investment expenditures are subject to the money constraint. Empirical work is less conclusive. Barro (1995) shows that sustained high-inflation rates, used as a proxy for expansionist monetary policies, are detrimental to long-run performances. However, subsequent work confirms the existence of a negative correlation between inflation and economic growth, but only for high-inflation countries (Bullard and Keating, 1995, Sarrel, 1996,…), showing that the relation between inflation and economic growth is probably non-linear. A number of recent econometric results exhibit threshold effects of inflation on economic growth,[2] confirming the non-linear relation between monetary policy and long-run growth. However, as Boyd et al. (1997, p.1) emphasize, "the mechanism underlying this apparently non-linear association remains to be unearthed", and this "epidemic of thresholds" in monetary policy seems not to have found its theoretical support.

Recent econometric studies have the merit of unifying the analysis of both monetary and fiscal policies. One interesting paper is Adam and Bevan (2005), who find strong empirical evidence on the existence of non-linearities in the effects of both fiscal deficits and

   [1] Since the seminal work of Fischer (1979).

[2] A nonlinear association between inflation and growth is detected by Boyd et al. (1997), Bruno and Easterly (1998), and Adam and Bevan (2005), for example.

seigniorage on economic growth. Unfortunately, economic theory provides only few global models for studying the effect of the fiscal and monetary policy mix on long-run economic growth, even if some papers deal with fiscal issues (see, for example, Ghosh and Mourmouras, 2004), or monetary ones (Palivos and Yip, 1995). Therefore, the aim of this paper is to analyze the impact of different economic policies (money creation, tax policy, public spending and public debt) on long-run economic growth in a global framework.

To this end we develop the model of Minea and Villieu (2009a). This model allows for money financing of public spending in the Barro (1990) endogenous growth model with productive public spending, and (mainly) examines the case of a money demand based on a cash-in-advance (CIA) constraint (like Stockman, 1981, or Palivos and Yip, 1995). In the present paper, we extend this model to the presence of public debt; therefore, we consider a non-trivial government budget constraint in order to study the effect of alternative ways of government finance on long-run economic growth. Moreover, we suppose a more general money demand, based on a "transaction cost" technology, depending both on income and the nominal interest rate, and displaying the CIA form as a special case. In addition, we assume that part of tax revenue is subject to "collecting costs", due to corruption, tax evasion, or, more generally, poor institutional quality. Similarly, we introduce an indicator of the "financial" or "banking" sector development, which is directly related to the capacity of collecting seigniorage revenues by the central bank. Effectively, in financially developed countries, most of seigniorage is retrieved by the banking system (the seigniorage on private deposits), and constitutes a "seigniorage flight" for the central bank, which can only collect the seigniorage on the monetary base (bank notes plus banks reserves). On the contrary, in financially repressed economies, most of seigniorage is collected by the central bank and can be used for government finance.

Our results are the following. First, the model exhibits a threshold effect on long-run economic growth in both monetary and fiscal policies. While the threshold effect of fiscal policy is standard in Barro-type models, the threshold in monetary policy is less usual. In our model, seigniorage is used to finance growth-enhancing public spending. But increasing seigniorage also raises transaction costs, which damage private investment incentives and economic growth. As a result, we find an inverted-U relation between the money-growth rate and the long-run rate of economic growth, with a positive seigniorage ceiling. The existence of ceilings in both seigniorage and tax rates for long-run growth maximization involves a trade-off between the two policy instruments. To finance public expenditures, a growth-maximizing government must choose relatively high seigniorage (respectively income taxation) rates if "collecting cost" and "financial development" coefficients are high (respectively low). Thus, our model may explain why some governments resort to seigniorage and inflationary finance, while others rather resort to high tax rates, as a result of growth-maximizing strategies in different structural environments.

Moreover we analyze the effect of public indebtedness on long-run economic growth and study how the policy mix is affected by the size of public debt. We show that higher public debt ratios are always growth detrimental, and that they increase the growth-maximizing rates of seigniorage and income taxation.

The paper is organized as follows: Section 2 presents the model and computes the steady-state rate of economic growth. In Section 3, we study threshold effects of monetary and fiscal policies on long-run economic growth. Section 4 develops numerical results about the growth-maximizing policy mix, Section 5 provides some empirical evidence confirming our theoretical results and Section 6 concludes the paper.

2. The model

We consider a closed economy, with a private sector and monetary and fiscal authorities.

2.1. The private sector

The private sector consists of a producer–consumer infinitely-lived representative agent, who maximizes the present value of a discounted sum of instantaneous utility functions based on consumption ($c_t > 0$), with $\rho > 0$ the subjective discount rate:

$$U = \int_0^\infty u(c_t) \exp(-\rho t) dt \tag{1}$$

To obtain an endogenous growth path, we assume an isoelastic instantaneous utility function with constant intertemporal elasticity of substitution ($S > 0$):

$$u(c_t) = \begin{cases} \dfrac{S}{S-1}\left((c_t)^{\frac{S-1}{S}} - 1\right), & \text{for } S \neq 1 \\ \text{Log}(c_t), & \text{for } S = 1 \end{cases} \tag{2}$$

For the intertemporal utility U to be bounded, we also have to ensure that $(S-1)\gamma_c < S\rho$, with γ_x the growth rate of the variable x. This condition corresponds to a no-Ponzi game constraint: $\gamma_c < r$, with r the real interest rate to be defined below.

The representative household generates output y_t using private capital k_t and productive public expenditures g_t, as in Barro (1990). All variables are per capita with population normalized to unity:

$$y_t = f(k_t, g_t) = A k_t^\alpha g_t^{1-\alpha} \tag{3}$$

where A is a positive parameter and $0 < \alpha < 1$ is the elasticity of output to private capital.[3] This condition ensures the existence of a competitive equilibrium, since g_t is exogenous for households and the production function exhibits decreasing returns to scale. In equilibrium, on the contrary, g_t is endogenously determined and the production function exhibits constant returns to scale, so that a constant growth path appears in the long-run.

To motivate a demand for money, we assume that all transactions, including consumption (c_t), investment (z_t) and government expenditures (g_t), are subject to a "transaction cost" (Φ), and that money provides "liquidity services" by reducing the transaction costs. Thus, the form of the transaction cost function is: $\Phi = \Phi(c_t + z_t + g_t, m_t)$, where $m_t = M_t/P_t$ is the stock of real balances (with M_t the nominal stock of money and P_t the price level). For households, the transaction cost affects consumption and investment decisions, since public spending g_t is not a choice variable. In equilibrium, however, the transaction cost depends on global income: $\Phi = \Phi(y_t, m_t)$. Assuming an isoelastic function, we have:

$$\Phi(y_t, m_t) = \psi y_t, \text{ where } \psi \equiv \frac{\phi_0}{\mu}\left(\frac{y_t}{m_t}\right)^\mu \tag{4}$$

where ϕ_0 is a positive scale-parameter ensuring "small" transaction costs, and $\mu \geq -1$ a proxy for the elasticity of the real money demand with respect to the nominal interest rate (see the definition of the money demand in Section 2.3 below[4]). In equilibrium, $\Phi(.)$ expresses that a fraction $\psi \in (0,1)$ of output is "lost" in the process of financial intermediation. This fraction is inversely related to the ratio of real balances to output (m_t/y_t), since money provides "liquidity services".

The transaction technology is an essential feature of our model. Notice that, contrary to usual cash-in-advance (hereafter CIA) or transaction costs models in which money provides liquidity services to consumers only, in our model money is used in all transactions and

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[3] This form of production function has been introduced by Barro (1990). See Barro and Sala-i-Martin (1992) for a general discussion on productive government expenditures, and Kneller et al. (1999) for empirical evidence.

[4] The real demand for money is interest-elastic if $-1 < \mu < \infty$, infinitely-elastic if $\mu = -1$ and inelastic if $\mu \to \infty$.