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Financial development, exchange rate regimes and productivity growth: Theory and evidence



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ABSTRACT

This paper provides a microfounded, quantitative model that rationalizes recent empirical evidence by Aghion et al. (2009), who find that fixed exchange rate regimes lead to higher long-run productivity growth in countries with low financial development, while the effect in financially developed countries is insignificant. The channel that explains this evidence in my model is the following: A fixed exchange rate regime leads to lower inflation when the money growth is otherwise high under flexible exchange rates. In turn, lower inflation results in higher long-run productivity growth since financial intermediaries hold a fraction of deposits as reserves, whose return is lower than the market rate and, thus, is affected by inflation. I show that the positive effect of fixed exchange rate regime on growth is larger for countries with lower levels of financial development because inflation and the fraction of deposits held as reserves are typically higher in these countries.

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1. Introduction

The choice of exchange rate regime has been an important topic in economic policy and research for a long time. Theoretical and empirical studies have tried to determine whether fixed or flexible exchange rates mitigate financial crises, lower consumption or output volatilities, affect productivity growth or any other important aspects of the performance of countries. The evidence and predictions of these studies are mixed. Some have found that fixed exchange rates are preferable, while others show exactly the opposite. In terms of the effect of exchange rate regimes on productivity growth, no significant empirical relationship has been found in many of the studies. Among these are [Baxter and Stockman \(1989\)](#) and [Ghosh et al. \(2002\)](#).

Recently, however, this view has been challenged by [Aghion et al. \(2009\)](#) who performed a panel data study in which they showed that, when a country's level of financial development is taken into account, the exchange rate regime matters for long-run productivity growth. When a country has a low level of financial development, a flexible exchange rate regime leads to lower productivity growth than a fixed exchange rate regime, while the effect is insignificant in financially developed countries. These results show that exchange rate regimes and productivity growth can be interrelated, motivating me to explore channels that link the exchange rate regime, the level of financial development, and productivity growth.

The main objective of this paper is to provide a microfounded model that rationalizes the evidence presented by [Aghion et al. \(2009\)](#). My contribution is to specify a microfounded general equilibrium small open economy model that focuses on the steady state in order to analyze the long-run effect of exchange rate regimes on growth.¹ The model extends a standard small open economy model by including productivity growth and a financial intermediary. Productivity growth is the result of

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E-mail address: dslavtcheva@clarku.edu¹ Here, the focus is solely on the steady state, so there are no shocks to the economy. [Slavtcheva \(2013\)](#) analyzes the effect of shocks in the same model framework and finds that when shocks are introduced in the model, they have no effect on the long run.

an increase in the number of varieties of home intermediate goods. The financial intermediary holds reserves in order to satisfy a reserve requirement and faces an asymmetric information problem in financing the product introduction activities of domestic entrepreneurs. Asymmetric information results in a costly state verification problem, where the monitoring cost incurred by the intermediary is the proxy for financial development. The important features of the model that generate the results in the paper are the presence of reserves, high money growth under a flexible exchange rate regime, and the decrease of reserves and inflation with increase of financial development.

My model shows that flexible and fixed exchange rate regimes result in different steady-state inflation rates depending on the money supply growth rate observed under flexible exchange rates. I assume that purchasing power parity holds so that home inflation under the fixed exchange rate regime equals foreign inflation, which is low because typically countries fix their currency to that of a low-inflation advanced country in order to import policy credibility (see Rogoff et al., 2004). Thus, when domestic money supply growth under the flexible exchange rate regime is high, the home country's inflation rate is higher under flexible exchange rates. Furthermore, my model predicts that lower inflation results in higher long-run productivity growth. Therefore, if a country has high money growth under the flexible exchange rate regime, inflation will fall and productivity growth will increase when the country switches to a fixed exchange rate regime.

The reason why inflation affects long-run productivity growth is that the financial intermediary in the model holds a fraction of deposits as reserves. Reserves are the source of non-neutrality of money in the model because they earn a return which is lower than the market rate and is, thus, affected by inflation. The lower return paid on reserves drives a wedge between the return paid on deposits and the return paid on loans by reducing the former and increasing the latter. In turn, this increases the repayment amount entrepreneurs have to pay, which reduces entry of new entrepreneurs in the economy and, consequently, productivity growth. Both reserves and inflation increase the wedge between the return on deposits and loans and, therefore, both reserves and inflation reduce productivity growth.

In addition, my model predicts that money growth under the flexible exchange rate regime, as well as the reserve ratio are high when financial development is low and that they decrease with financial development. Under the flexible exchange rate regime, the growth rate of money supply and the reserve ratio are endogenously determined by the government, which uses them as a source of seigniorage revenue. They are set so that the government maximizes the discounted lifetime utility of households, given that it receives a certain target amount of seigniorage revenue. The target level of seigniorage revenue in the model is exogenous and calibrated to decrease with financial development, as in the data (Aisen and Veiga, 2008 and Cukierman et al., 1992). The model shows that the optimal rate of inflation and the reserve ratio are lower in more financially developed countries because growth increases with financial development, and, thus, the seigniorage revenue that the government can receive for given values of reserves and inflation is higher when financial development is higher. Therefore, in order to receive lower seigniorage revenue when financial development is higher, the government needs to reduce the reserve ratio and inflation. Under the fixed exchange rate regime home inflation is the same as foreign inflation, while the reserve ratio is assumed to be the same as under the flexible exchange rate regime. As a result, the growth differences between a fixed and a flexible exchange rate regime are large when financial development is low and they decrease with financial development, consistent with the empirical evidence provided in Aghion et al. (2009).

Aghion et al. (2009) is the paper that is closest to mine. In addition to providing empirical support for the effect of exchange rate regimes on growth, they have a theoretical model that explains their results. They suppose that borrowing of credit constrained firms is proportional to current earnings and, in the case of exchange rate appreciation, current earnings are reduced, so that borrowing and product introduction decrease. When the exchange rate depreciates, the results are the opposite. However, the authors state that, in general, the two effects will not offset each other. The contribution of my paper is that it shows another channel which can explain the empirical results. Moreover, I use a microfounded, quantitative model and I can numerically evaluate the effects present in this paper and perform welfare analysis. The current paper is also more broadly related to papers modeling the long-run effect of inflation on growth such as Haslag (1998) and Chari et al. (1995). These papers show that inflation affects long-run growth because financial intermediaries hold reserves whose return is negatively related to the inflation rate – the same channel through which inflation affects growth in my model. Also, Roubini and Sala-i-Martin (1995) and Brock (1989) introduce endogenous determination of reserves and inflation and show that governments use the reserve ratio as a base for the inflation tax. They do not, however, consider how financial development affects the choice of reserves and inflation.

By incorporating the level of financial development in the exchange rate-growth nexus, my work is also related to the prolific literature on the link between financial development and growth. In particular, it is similar to endogenous growth models such as Blackburn and Hung (1998) and De la Fuente and Marin (1996), where financial development mitigates information asymmetry problems between financial intermediaries and entrepreneurs and thus affects productivity growth. Also, my model generates results that are consistent with other empirical regularities. It has been documented by many empirical studies that different exchange rate regimes imply significant differences in inflation performance (Husain et al., 2005, Levy-Yeyati and Sturzenegger, 2001, 2003 and Ghosh et al., 2002). These studies show that countries with fixed exchange rate regimes have lower inflation rates than countries with flexible exchange rate regimes. In addition, another large part of the macroeconomic literature has found that the long-run growth of countries is affected by the inflation rate observed in these countries. Fischer (1991), Fischer (1993), Roubini and Sala-i-Martin (1995), Grier and Tullock (1989), and Barro (1995) show that countries with higher inflation rates exhibit slower long-run growth. Furthermore, Haslag (1998) shows that reserves and inflation reduce growth, while Haslag and Koo (1999) show that reserves are higher when financial development is lower, and that reserves and inflation move together.

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