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Convergence, capital accumulation and the nominal exchange rate



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This paper develops a flexible price, two-sector growth model with a nominal side to study the role of the exchange rate in transition dynamics. We adopt a standard small open economy model with traded and nontraded goods, where the engines of growth are exogenous productivity improvements and capital accumulation. We enhance this standard framework by adding a preference for real money holdings, captured by money-in-the-utility. We follow Schmitt-Grohé and Uribe (2003) and assume that the interest rate on bonds issued by the small open economy is debt-dependent, and interpret it as a simple financial friction. We show analytically that the choice of the exchange rate regime influences the transition dynamics of a small open economy through the balance sheet of the central bank. We then calibrate the model to explore the quantitative significance of our results. We find that the choice of the exchange rate regime has significant and lasting effects on prices, consumption, investment and sectoral allocations, and the composition of financial assets.

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1. Introduction

The nominal exchange rate is one of the most important prices for a small open economy. There are strong linkages among exchange rate movements, the external position, and short-run fluctuations in

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open economies. In this paper we show that the exchange rate is not only important for the business cycle, but it can also influence the growth process of a small open economy. We argue that the choice of the exchange rate regime is not neutral, and the *financial wealth and capital accumulation paths depend on the nominal regime*.

As suggested by consumption smoothing, catching-up economies should be borrowing against their future income. As we document below, they also build up their financial asset holdings. A large fraction of these assets are local currency denominated cash and bank deposits, the value of which moves together one in one with nominal exchange rates. This implies that the evolution of the nominal exchange rate can influence the asset accumulation process. Such a link then has repercussions for capital accumulation, growth and sectoral (tradables versus nontradables) reallocations.

There is, however, a potentially offsetting effect from the central bank: its local currency liabilities deliver a capital loss exactly when household assets experience a capital gain. When consolidating the external position of the country, it turns out that the choice of the exchange rate regime is not neutral as long as the central bank has some foreign reserves in its balance sheets, and those reserves offer lower returns than the cost of foreign borrowing by households. This is the case, for example, in an emerging economy's currency board regime, where the central bank holds riskless bonds, while households have to pay a risk premium on their foreign liabilities. Our objective is to develop a simple but sufficiently rich framework, which is capable of quantifying the aggregate and sectoral features of such a nominal growth process.

The structure of the model is the following. We consider a small open economy, with a traded and a nontraded sector and flexible prices. The sources of growth are capital accumulation and improvements in total factor productivity (which we assume to be exogenous). We assume that the initial capital stock is below the steady state level, so the country experiences both capital accumulation and excess productivity growth along its transition towards the steady state.¹ We adopt the standard Tobin-q approach to capture gradual capital flows. We introduce an asset accumulation motif by assuming that households derive utility directly from holding (real) money balances (*money in the utility*). As the income of consumers grows, they want to consume more and also to hold more money (assets).

A key assumption we make is that foreign and domestic money cannot be used as substitutes. Domestic residents only value domestic cash (they do not derive utility from holding foreign money), while domestic cash is worthless for the rest of the world. We also assume that domestic money can only be created by the domestic monetary authority. Residents can import foreign money ("euros"), but they have to convert them to local currency through the central bank. Similarly to chapter 5 of Végh (2011), we distinguish monetary (exchange rate) regimes by the willingness and ability of the central bank to convert foreign currency into domestic one.

After setting up the model we turn to the analysis of the growth process. We first show that in case of purely flexible exchange rates (fixed money stock and no foreign reserves), the nominal economy behaves identically to an economy without money, in the sense that all real variables (most importantly, consumption expenditures and capital) are exactly the same as in a model where money has no role. The reason is that when convergence leads to an increase in money holdings, it is simply implemented by an appreciating nominal exchange rate.

The nominal and the real paths differ, however, when the exchange rate is fixed, there are foreign reserves and the central bank earns a lower return on these reserves than the country's external financing cost. This is the case, for example, when the country operates a currency board. Historically, the gold standard shared the same features. Under these assumptions, the interest rate differential on foreign reserves leads to a capital loss on the consolidated net foreign asset position of the country. This, in turn, implies that transition dynamics in the currency board regime differ from that of an economy where money is not valued.

¹ In what follows, we use the phrases 'transition dynamics' and convergence interchangeably, both referring to the trajectory leading towards the steady state.

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