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The dynamics of inflation and currency substitution in a small open economy

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Abstract

This paper analyzes the relationship between money and inflation in a small open economy, where domestic and foreign currencies are perfect substitutes as means of payment. It is shown that, if the path of domestic money supply is such that individuals find it optimal to change the currency in which transactions are settled, there will be an adjustment period during which domestic inflation adjusts to equal the foreign inflation rate. The model captures the stylized fact that temporary increases in the inflation rate may have permanent effects in the use of foreign currency, even without the introduction of dollarization costs.
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1. Introduction

In high inflation countries, the rapid erosion of the value of domestic currency leads agents to substitute it with foreign currency in any or all of the basic functions of money. This phenomenon is usually called currency substitution, or simply dollarization (for a literature review, see Giovannini and Turtelboom, 1994). A question that has attracted increasing attention is that, in some cases, dollarization exhibits *hysteresis*, with the demand for foreign currency remaining high after stabilization (for empirical evidence, see Guidotti and Rodriguez, 1992; Kamin and Ericsson, 2003; Clements and Schwartz, 1993; Mueller, 1994; Reding and Morales, 1999). However, this is not always the case. In some economies of Eastern Europe,

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for example, dollarization has fallen substantially in the aftermath of successful stabilization plans (Sahay and Végh, 1996).

This paper follows Guidotti and Rodriguez (1992); Uribe (1997), and Reding and Morales (1999), addressing the issue of dollarization hysteresis with a small open economy model where domestic and foreign currencies are perfect substitutes as means of payment. Our approach contributes to the literature in two main respects. Firstly, we allow the inflation rate to be endogenous. Secondly, we are able to explain the phenomenon of dollarization *hysteresis* even in the absence of dollarization costs.

Previous explanations for the phenomenon of dollarization hysteresis have emphasized the role of dollarization costs. Dornbusch and Reynoso (1989) and Dornbusch et al. (1990) argued that the process of financial adaptation involves learning costs that, once incurred by economic agents, imply persistence. Guidotti and Rodriguez (1992) present a model with perfect means of payment substitutability, in which agents face costs of adjusting their holdings of foreign currency. These costs result in an inflation band within which agents choose not to switch between currencies. Hence, de-dollarization may only be achieved if domestic inflation decreases enough to offset the switching costs. Perfect means of payment substitutability was also assumed by Uribe (1997) and Reding and Morales (1999), who stressed the role of network externalities as the source of non-linearities in the relationship between money demand and inflation. According to this interpretation, transaction costs faced by individual agents decline with the aggregate level of dollarization, giving rise to multiple equilibria and history dependence in the demand for money. Thus, a temporary high level of inflation can start a dollarization process which will not necessarily be reversed when inflation comes down, as network economies will provide agents with a permanent lowering of transaction costs in the use of foreign currency.

Guidotti and Rodriguez (1992); Uribe (1997), and Reding and Morales (1999) have two important shortcomings. First, the inflation rate is assumed to be exogenous. As changes in the money demand impact on the inflation rate, the dynamic analysis made by these authors may be misleading. Second, these approaches involve the specification of dollarization cost functions, which are necessarily ad-hoc.

In this paper we argue that the short-term dynamics of money and inflation under the assumption of perfect means of payment substitutability is sufficiently rich to capture the different patterns of dollarization identified in the empirical literature, without the need to introduce dollarization costs. A well known result with perfect substitutability is that, without binding constraints on currency holdings, the exchange rate is undetermined (Kareken and Wallace, 1981). In short, any monetary equilibrium with two currencies coexisting in the same commodity domain requires their user costs (inflation rates) to be equal. Under these circumstances, the demand for each currency is undetermined and so, too, will be the (unchanging) exchange rate. The same mechanism that produces exchange rate indeterminacy in Kareken and Wallace (1981) is at work here, but our model differs in that residents of both countries face binding constraints in the use of currencies. In particular, we assume that foreign residents are not allowed to hold the

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