



# Currency mismatch, openness and exchange rate regime choice

Nicolas E. Magud

*International Monetary Fund, 700, 19th St., NW Washington, DC 20431, USA*

## ARTICLE INFO

### Article history:

Received 3 March 2008

Accepted 2 August 2009

Available online 26 August 2009

### JEL classification:

E31

E32

F34

F41

### Keywords:

Currency mismatch

Liability dollarization

Balance sheets

Exchange rate regimes

Openness

Nominal rigidities

## ABSTRACT

The paper analyzes the choice of an exchange rate regime for a small open economy indebted in foreign-currency, incorporating the financial accelerator. Conventional wisdom suggests that floating regimes should insulate the economy from real shocks. I show that this result depends on the degree of openness of the economy and foreign-currency indebtedness and, in fact, does not hold for relatively closed economies. The transmission mechanism relies on non-linearities in the impact of unanticipated real price changes on the external finance premium in the spirit of Fisher (1933).

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## 1. Introduction

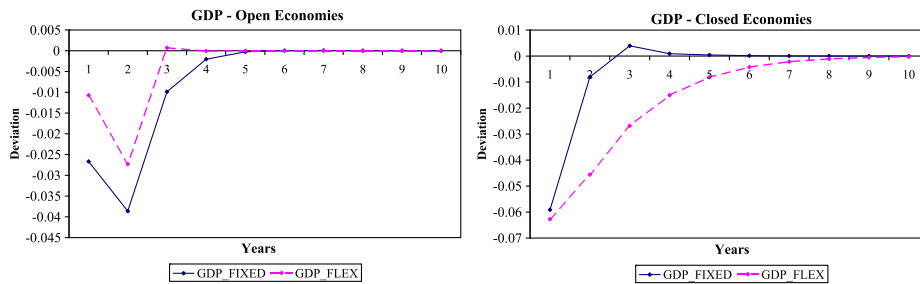
Conventional wisdom, which goes back at least to Meade (1951) and Friedman (1953), states that in the presence of nominal rigidities, flexible exchange rates are to be preferred in countries that are mostly exposed to real shocks. The rationale for this argument is that the exchange rate accommodates the required change in relative prices that domestic prices are temporarily unable to do by themselves, thereby dampening any real effects. In contrast, under a fixed exchange rate, the real side of the economy bears the burden of the adjustment (e.g. a recession in case of a negative terms of trade shock) so as to make relative prices progressively and costly adapt to the new equilibrium. This paper shows that under currency mismatch, the degree of openness matters for the selection of an exchange rate regime. Specifically, conventional wisdom only holds for sufficiently open economies. For relatively closed economies, on the contrary, fixed exchange rate regimes are better (real) shock absorbers.

During the Asian crisis of 1997 entrepreneurs in most developing countries were under a currency mismatch: debts were in foreign currency<sup>1</sup> – while sales were usually priced in domestic currency. This gives a salient role to the balance sheet (or credit) channel<sup>2</sup>: if the economy is unexpectedly “forced” into a real depreciation, the burden of debt instantaneously jumps while revenues, at best, remain constant in domestic currency. Consequently, entrepreneurs’ net worth decreases, many firms

*E-mail address:* [nmagud@imf.org](mailto:nmagud@imf.org)

<sup>1</sup> Mainly in dollars, thus giving rise to the common terminology of liability dollarization. Theoretical explanations include, among others, Caballero and Krishnamurthy (2003) and Jeanne (2001).

<sup>2</sup> See e.g. Krugman (1999) and Calvo (1999).



**Fig. 1.** Impulse response for relatively open economies (left panel) and relatively closed economies (right panel) in presence of fixed and flexible exchange rate regimes.

are unable to repay their debts and go bankrupt, and output decreases because of the decreased ability of firms to raise funds to finance the purchase of additional capital.

In response to this, some models introduce balance sheet effects in a general equilibrium setting with nominal rigidities (e.g. Cespedes et al. (2001a,b, 2004), CCV henceforth, or Gertler et al. (2007)), and claim that (Friedman's) conventional wisdom is still valid. In these models, the expansionary effects of the real depreciation offset the contractionary balance sheet effects generated by the currency mismatch. This implies that floats should be preferred to fixed regimes in order to absorb real shocks. Moreover, CCV claim that the balance sheet effect can not offset the expansionary effects of depreciations unless unrealistic assumptions on parameter values are considered.<sup>3</sup> Closely related to this paper, Devereux et al. (2006) build a small open economy with financial frictions as well as tradables and non-tradables. The latter focusses on the role that the degree of exchange rate pass through plays in choosing an exchange rate regime (or more generally, alternative monetary rules), and on welfare evaluations of alternative regimes. Elekdag and Tchkarov (2004, 2007) also thoroughly study the welfare effects of alternative exchange rate regimes under balance sheet effects; the results of the latter are in line with my findings (see below) but focused on the existence of a threshold level of debt-to-GDP for fixed exchange rates to dominate flexible ones. Cook (2004) shows how financial frictions can make depreciations to be contractionary. The present paper fits into the literature in this cluster, separating from the rest by giving a central role to the degree of openness.<sup>4</sup>

The empirical evidence is mixed. Broda (2004), Edwards and Levy-Yeyati (2002) and Levy-Yeyati and Sturzenegger (2001a,b) present evidence consistent with flexible exchange rate regimes being better than fixed regimes in absorbing terms of trade shocks. Calvo and Reinhart (2001, 2002), Calvo et al. (2002), Hausmann et al. (1999), Devereux (2001), document that the output effects of real shocks are larger in countries with flexible exchange rate regimes when compared with countries that fix their exchange rate.<sup>5</sup>

In a purely empirical companion paper I document that the output response to terms of trade shocks depends on the degree of openness of the economy. Fig. 1 shows the impulse response of a panel VAR in which the observations are separated by the degree of openness. For each subset, the evidence shows the effect of a similar shock to fixed versus flexible exchange rate regimes. For foreign-currency indebted countries, relatively open economies tend to be better insulated from real shocks (in terms of output dynamics) when they are under a flexible exchange rate regime. However, relatively closed economies are able to buffer the real shock better if they are ruled by a fixed regime.

Thus, the contribution of this paper focuses on explaining why the choice of the exchange rate regime should be contingent on the degree of openness of the economy and the degree of currency mismatch. Specifically, in response to real shocks such as terms of trade, international interest rate or export demand shocks, some countries will be better served by fixed regimes, whereas some others will be better off with flexible arrangements. In the present version, only terms of trade shocks will be considered. This is in order to replicate the empirical findings mentioned above.<sup>6</sup> It is also the shocks studied by Devereux et al. (2006) and Broda (2004) among others – which seem relevant to emerging economies.

The exchange rate regime choice depends on the share of non-tradable goods in aggregate output and the ratio of the foreign-currency-denominated debt to total debt. I build a Stochastic dynamic general equilibrium (SDGE) model with nominal rigidities, financial frictions and foreign-currency-denominated debt to explain these stylized facts. Using this framework, the specific contributions of this paper are the following.

<sup>3</sup> CCV also study the differentiated effects on a financially vulnerable vs. a financially robust economy; additionally, they explore some welfare computations. In Gertler et al. (2007) the argument is somewhat different. They introduce a standard Taylor rule in which the domestic interest rate responds to changes in output, inflation and prices and the expansionary channel emerges out of the decrease in the nominal interest rate as a response to the real shock.

<sup>4</sup> Related to the choice of exchange rate regimes, Mundell (1960) analyzes Optimal Currency Areas. Small open economies affected by asymmetric real shocks should establish fixed exchange rate regimes to reduce real exchange rate volatility. The latter, in turn, reduces output volatility; in this sense, the higher the degree of openness, the more responsive output is to fluctuations in the real exchange rate. Poole (1970) shows that for small open economies mainly affected by real shocks, flexible exchange rates outperform fixed regimes, whereas the opposite is true for economies more exposed to nominal shocks. My results, however, are focused on symmetric real shocks only.

<sup>5</sup> Interestingly, Hausmann et al. (1999) show that the response of the economy to real shocks is non-linear, in line with Section 3 below.

<sup>6</sup> A similar procedure is used in Uribe and Yue (2006), in which they estimate empirical VAR's and then replicate their estimated impulse responses with a theoretical model, without any reference to welfare evaluations. Note also that Devereux et al. (2006) compute welfare effects.

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