



Devaluation and pass-through in indebted and risky economies

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ABSTRACT

This paper develops a structural general equilibrium model to analyse the pass-through from devaluation to producer and consumer prices in Emerging Market Economies (EMEs). Simulation analysis shows that balance-sheet effects created by capital market imperfections and the home bias shrink the impact of devaluation on both types of internal prices. This finding helps explain why pass-through to internal prices is low in EMEs. It also shows that, for benchmark values of the parameters, devaluation remains a good device to modify the real exchange rate and to mitigate the negative impact of external shocks in EMEs.

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1. Introduction

Substantial literature on the extent to which exchange rate variations are passed on to internal prices has documented two regularities for a broad range of developed countries and industries¹: first, the exchange rate pass-through (ERPT) reaches maximum levels for *import prices* (50% on average) whereas it is rather low for the rest of the prices along the distribution chain². Second, ERPT to *internal price* indices, such as prices of producer goods and of consumer baskets, has followed a general declining trend since the mid 1990's.

The empirical studies on ERPT in lower-income economies, which are notably less abundant than studies for developed countries, show results in the same direction as specified above or even more intensively. Thus, some empirical studies reveal that the ERPT ratio onto import prices in emerging market economies (EMEs) clearly surpass the levels reached in industrialised countries. For example, Barhoumi (2005) found that this ratio ranges between 77% and 83%, whilst estimations by Frankel, Parsley, and Wei (2005) indicate that it is almost four times as high as it is for developed countries. The contributions of Burstein, Eichenbaum, and Rebelo (2002, 2005) confirm these general results, noting that ERPT is complete (100%) when import prices are measured at the docks.

The differences in the size of the ERPT to import prices in developed and developing countries may be explained by the pricing behaviour of the foreign firms that export intermediate and final goods to those countries. In the case of emerging market economies, which are price takers in the imported good markets, foreign firms enjoy very high market power and set prices in their own currency, or preponderantly in US dollar (producer currency pricing). They do not modify prices expressed in their own currency after nominal exchange rate shocks, which leads to very complete ERPT onto importing prices in EMEs. In contrast, in developed countries foreign firms interact – imperfectly – between themselves and, as a result, do not fully transmit exchange rate variations onto prices of the importing country (some degree of local currency pricing or pricing to market strategies). Their mark-up partially absorbs the variations in the exchange rate³.

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¹ Instructive surveys of these stylised facts are presented in Gagnon and Ihrig (2004), Frankel, Parsley, and Wei (2005), Choudhri and Hakura (2006) and An (2006).

² For many industries of OECD countries, the ERPT ratio onto import prices is usually reckoned around 50%. However, AL-Abri and Goodwin (2009) show that this coefficient increases dramatically with the application of modern threshold cointegration techniques.

³ García-Solanes and Torrejón-Flores (2009) found that these differences in pricing strategies explain why PPP for tradable sectors holds in EMEs and not in OECD countries. Brissimis and Kosma (2007) and Banik and Biswas (2007) showed that imperfect competition models are necessary to explain and assess the pricing behaviour – and consequently the size of ERPT – of Japanese firms operating in the US market.

In a recent paper, Ito and Sato (2007) also found important differences at the two extremes of the transmission chain in emerging market economies: they discovered that the pass-through in EMEs decreases from high values in *import prices* to much lower levels in *consumer price indices*, a result that Cortinhas (2007) extended to a group of 5 ASEAN countries. In connection with this finding, Borensztein and De Gregorio (1999) and Golfajn and Werlang (2000) detected that devaluations in developing countries, induced by currency crises, were weakly transmitted onto internal consumer prices.

A set of papers shows that a decreasing trend in ERPT onto internal prices during the last fifteen years is also present in many EMEs, and that it goes hand in hand with a fall in inflation, generated in many instances by a shift of monetary policies towards inflation targeting strategies⁴. See, for example, Mihaljek and Klau (2001), Choudhri and Hakura (2006), Devereux and Yetman (2002), Bank for International Settlements (2002) and Barhouni and Jouini (2008). According to Barhouni (2006), reductions in ERPT to internal prices in EMEs are also favoured by flexibility in the exchange-rate regime and by a small degree of openness.

The difference of ERPT between imported and home produced and/or consumed goods, or more generally between tradable and non-tradable goods, has important policy implications. As emphasised by Edwards (2006), if the increase in prices is faster and larger for tradables than for non-tradables, devaluation modifies the real exchange rate in the way required by stabilisation policies, and contributes effectively to boost exports and to absorb external shocks.

In this paper, we investigate the extent to which some economic and institutional factors, inherent to risky and indebted EMEs, affect the pass-through generated by currency devaluation in those countries. It is worth noting that, if international capital markets work imperfectly, devaluation triggers important balance-sheet effects in risky and indebted EMEs, which shrink the demand for domestic goods and reduce the final impact of devaluation on internal general prices of these countries. Our results show, indeed, that these institutional factors may help explain the two ERPT regularities mentioned above for a large set of EMEs.

As a by-product, we also explore the implications of our results for the stabilising properties of currency devaluation in these economies. The analysis is particularly relevant for countries that, in addition to supporting large amounts of foreign debt, still have the possibility of devaluating their currency. The sample includes the EMEs that keep rigid exchange rate regimes (for example, Ecuador, El Salvador, Panama, Bulgaria, and Cambodia), crawling pegs (such as Bolivia and Costa Rica) or pre-announced crawling bands (for instance, Honduras).

The implications of these balance-sheet effects have been incorporated in the analysis of the effects of devaluation on real activity in developing countries (for example, Céspedes, 2005; Céspedes, Chang, & Velasco, 2003, 2004 – CCV hereafter – and Tovar, 2005), but they have been systematically neglected in the available literature on ERPT. To fill this gap, we build a structural stochastic model for a small open developing economy affected by balance-sheet effects. In this model, production and distribution activities are the main focus of attention, and behavioural relationships are obtained assuming that all agents maximize their utility or profit. Compared to previous frameworks that analyse the effects of devaluation in this kind of economies, our model incorporates two important novelties: first, in the production side of the economy we derive an aggregate supply function that includes inertia in the setting of prices in the spirit of the New Keynesian Phillips curve for open economies. This is a necessary pillar to investigate the effects of devaluation on internal producer prices⁵. Second, we derive an optimal monetary policy function by assuming that the central bank minimises inter-temporal losses generated by both output gaps and deviations of the exchange rate around the value targeted by the central bank.

We solve for the deviations of the endogenous variables around their stationary level as functions of the exogenous parameters, and perform simulation exercises after giving the parameters of the model a set of values that are generally accepted in the literature. This procedure allows us to clarify how the effects of devaluation and other exogenous shocks are transmitted through four channels before impacting on the two types of internal prices considered in the model.

Let us describe the most important results. We obtain that devaluation is only partially transmitted to the two internal prices, producer and consumer, and that balance-sheet effects play an important role in this respect. We also find that the home bias and an increase in the flexibility in the exchange rate lead to lower general ERPT ratios. Since flexibility in the exchange rate is an important element of inflation targeting schemes, our results do not contradict the connection between declining trends in ERPT, on the one hand, and increasing adoption of inflation targeting regimes in EMEs during the last fifteen years, on the other.

Our simulations also indicate that ERPT is extremely low in the case of the producer price. The reason is that domestic firms produce differentiated goods, and the final impact on the price index is determined not only by the initial transmission of devaluation through imported inputs, but also by a complex mixture of price-setting inertia, demand forces and the intervention of the central bank to minimise its loss function. Finally, given that in our model exchange rate variations are completely transmitted to import prices, our findings also provide an explanation for the remarkable difference between ERPT coefficients of import prices, on the one hand, and general internal prices on the other.

The main policy implication is that balance-sheet effects, as well as reducing the impact of devaluation on CPI inflation, also enlarge the effects of devaluation on the real exchange in EMEs, which is more relevant for economic policy purposes.

The rest of the paper is organised as follows. Section 2 presents the theoretical model, and solves it for the relevant endogenous variables; Section 3 evaluates numerically the impact of currency devaluation on internal prices. Finally, Section 4 summarises the main conclusions and derives some policy implications.

⁴ The impact of the inflation environment on ERPT was first emphasised by Taylor (2000). According to him, a strong commitment towards price stability reduces pass-through, which, in turn, helps maintain low inflation.

⁵ These effects can not be analysed in models rooted exclusively in the demand side of the economy, such as the IS-LM framework used by CCV.

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