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Capital Flows and Real Exchange Rate Appreciation in Mexico

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Summary. — Following the recently-developed bounds testing approach, the paper analyzes the long-run determinants of the Mexican peso's real exchange rate from 1988Q1 to 2008Q2. Controlling for the standard determinants, the paper shows that all types of capital inflows tended to appreciate the peso. In contrast to recent multi-country studies, it finds no evidence of a less harmful effect from foreign direct investment (FDI)—on the contrary, the FDI's appreciation effect can be particularly strong—and interprets this finding. The paper also shows that monetary policy, through changes in the short-term interest differential, can have persistent, level effects on the real exchange rate.

Key words — capital flows, FDI, real exchange rate, ARDL bounds testing approach, Latin America, Mexico

1. INTRODUCTION

A well-known problem in development macroeconomics is the potentially contradictory role played by foreign capital inflows (their "mixed blessing"). Capital inflows allow a country to run current account deficits, and, therefore, to attain higher investment levels without having to sacrifice consumption. The inflows, however, tend to appreciate the recipient country's currency in real terms, eroding profitability in the tradables sector, and thus favoring a boom in consumption rather than investment. The appreciation effect has led to increasing skepticism about the positive influence of capital flows on economic growth (for broad reviews of the literature, see Kose, Prasad, Rogoff, & Wei, 2010; Obstfeld, 2008 and, for a more optimistic interpretation, Henry, 2007).

Drawing on the experience of developing countries, a series of studies in the early 1990s focused on how macroeconomic policy could reduce the capital inflows' appreciation effect. Key themes that emerged from that literature include the limits in the use of capital controls and foreign exchange intervention; the fiscal cost of sterilized intervention; and the role of fiscal tightening in easing inflationary pressures in the nontradables sector (see Calvo, Leiderman, & Reinhart, 1994; Corbo & Hernández, 1996; Fernández-Arias & Montiel, 1995; Williamson, 1995; Gavin, Hausmann, & Leiderman, 1996, and Cardarelli, Elekdag, & Kose, 2010 present a new empirical assessment of alternative policy responses to capital surges).

More recent studies have considered whether the composition of capital inflows, and not just their size, matters for the determination of the real exchange rate. Athukorala and Rajapatirana (2003), working with pooled series for 14 Asian and Latin American countries from 1985 to 2000, reached the surprising conclusion that foreign direct investment (FDI) tends to depreciate the recipient country's currency. According to the authors, the depreciation effect could be explained by the FDI's bias toward the tradables sector—whose prices are anchored in world markets—and, therefore, its weak effect on domestic (nontradable) prices. Earlier, some authors had observed that FDI has a relatively minor impact on credit—and thus on aggregate demand and domestic prices—because it need not be intermediated by the financial sector (see Calvo *et al.*, 1994). Both propositions, however, would explain why FDI has a small appreciation effect, but not why it has a depreciation effect.

Other studies have reached less clear-cut conclusions. Bakardzhieva, Naceur, and Kamar (2010) studied a panel of 57 developing countries during 1980–2007 and concluded that, while most types of capital inflows cause real currency appreciation, the effect from FDI is statistically nonsignificant. Saborowski (2010), working with a panel of about 80 developed and developing countries since the 1990s, found that both FDI and other types of foreign capital inflows tend to appreciate the currency; the effect from FDI is statistically weaker, however, and it becomes smaller with the countries' level of financial development. Aizenman and Riera-Crichton (2008) studied a sample of 80 developed and developing countries from 1970 to 2004, and concluded that, for specific country groups, a depreciation effect emerges once the effect is conditioned on the countries' degree of trade openness.

The present paper studies the role of capital flows in the determination of Mexico's real exchange rate. Mexico's stylized facts make it an interesting case study. After liberalizing its trade regime and adopting an outward-oriented economic strategy, the country received large amounts of foreign capital during the 1990s and early 2000s (with the interlude of a currency crisis in 1994–95). But despite the presence of large capital inflows (and the rapid expansion of manufactured exports triggered by the liberalization of trade), over the medium term economic growth has been slow. A likely factor is the persistent real appreciation of the peso. As shown by Ibarra (2010), investment in Mexico in the post-liberalization period has been largely unresponsive to capital flows but highly responsive to the real exchange rate—which is consistent with the idea that investment has been held back, not by lack of external funding, but by the low profitability of a persistently appreciated currency (see also Blecker, 2009).

While the peso's real exchange rate at first sight appears to be correlated with capital flows, there are at least two open questions. First, the real exchange rate may reflect the influence of "fundamentals" like relative productivity in the tradables sector. By definition, in that case the currency appreciation would imply no negative effect on profitability in the tradables sector. The question is whether, after controlling for the influence of

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relative productivity and other fundamentals, capital flows still played a role in the sustained appreciation of the peso.

Second, each of the two recent episodes of capital surge in Mexico presents noteworthy features. Although capital flows were larger (in relation to GDP) before the 1994–95 currency crisis than afterward, the extent of real currency appreciation was similar. Perhaps more importantly, there was a sharp change in their composition, with a shift from portfolio investment to FDI. Given this shift, the question is whether the different types of inflows had a significantly different effect on the peso's real exchange rate—as suggested by recent multi-country studies.

The analysis in the paper relies on the estimation of long-run real exchange rate equations for the Mexican peso. The equations incorporate separately the main types of capital inflows—which to the author's knowledge has not been done before in Mexico's case. The estimations follow the Autoregressive Distributed Lag (ARDL) bounds testing approach of Pesaran, Shin, and Smith (2001). The period under analysis extends from the first quarter of 1988 (after completion of major trade liberalization in Mexico) until the second quarter of 2008 (before the eruption of the global economic crisis, whose effects are left as a topic for future research).

The estimations control for the influence of well-known fundamentals comprising the ratio of industrial production between Mexico and the US (which may be interpreted as an indicator of relative productivity in the tradables sector), the ratio of the share of government consumption in GDP between the same countries, and the international price of oil; alternatively, some equations include Mexico's terms of trade index instead of the oil price. The estimations also control for the influence of the peso–dollar real interest rate differential (or alternatively the broad money supply M2) and the central bank's accumulation of international reserves, both of which allow a discussion of monetary policy.

The rest of the paper is organized as follows. Section 2 briefly discusses the stylized facts of the Mexican economy. Sections 3 and 4 describe the estimation methodology and data characteristics. Section 5 presents the estimation results. Finally, Section 6 gives a summary of results, discusses their possible relevance for developing countries in general, and considers some policy issues.

2. CAPITAL FLOWS AND REAL EXCHANGE RATE IN MEXICO

During the period under analysis there were three episodes in the evolution of capital flows and the real exchange rate in Mexico. The first two (1988–93 and 1996–2001) featured a steady increase in capital inflows accompanied by real currency appreciation, while the final one (2002–mid 08) showed smaller inflows and a stable but strong currency.

For most of the 1980s, in the aftermath of the international debt crisis, Mexico received little capital from abroad. As measured by the country's financial account balance, total capital inflows in 1988 were in fact negative, equivalent to −0.2% of GDP. As part of a global trend affecting emerging markets, capital inflows began to recover in the second half of 1989, increasing steadily in the following years and reaching a peak of 10.9% of GDP in 1993. At the same time, there was heavy currency appreciation: whether measured by the Bank of Mexico's real effective (multilateral) exchange rate, the consumer price ratio between the US and Mexico, or the relative unit labor cost in the manufactures between the same countries, by 1993 the peso had appreciated by more than 30% with respect to its 1988 level (see Table 1).

The first episode of strong capital inflows and currency appreciation ended in the currency crisis of 1994–95, during which capital inflows suddenly stopped and the peso collapsed. The fall in capital flows was short-lived, however, and a steady recovery began in 1997. The financial account balance rose from 1.2% of GDP in 1996 to 7.2% in 2001. Meanwhile, the peso followed a trajectory similar to that observed in the first episode, accumulating by 2001 a real appreciation of at least 30%—depending on the specific real exchange rate measure—with respect to the level observed in 1996.

Perhaps unsurprisingly, economic growth—particularly in the industrial sector—closely tracked the real exchange rate's path (see Ibarra 2010 for estimates of the real exchange rate's effect on investment in Mexico). Under the positive influence of successful macroeconomic stabilization and a competitive real exchange rate, GDP growth accelerated in the late 1980s but peaked early on, declining from 5.2% in 1990 to 1.9% in 1993; meanwhile, industrial production growth slowed from 6.6% to 0.6%. A similar picture emerges in the second episode, with industrial growth falling from 9.6% in 1996 to −3.3% in 2001, and that in GDP from 6.8% in 1997 to −0.2% in 2001.

But while they present a similar blend of rising capital inflows, appreciating currency, and falling economic growth, the two episodes differ in the composition of the inflows. During the first episode, capital flowed in mainly as portfolio investment, which increased from 0.5% of GDP in 1988 to 9.7% in 1993. In those years FDI was small and stable. In the second episode the roles reversed: portfolio investments were small although volatile, while FDI rose from 2.7% of GDP in 1996 to 7.6% in 2001.

Finally, during the third episode, from 2002 until mid 2008, total capital inflows initially fell and then stabilized at relatively low levels. There was no further real currency appreciation—on the contrary, the appreciation accumulated in the previous years was partially reversed. The peso, however, remained strong and far from the levels observed in 1988 and 1996. The strong currency was accompanied by a low average rate of economic growth.

3. METHODOLOGY

To examine the main questions posed in the paper, the following real exchange rate equation may be estimated:

$$\mathrm{BRER_{LR}} = \delta_0 + \delta_1 Z_1 + \delta_2 Z_2 + \cdots + \delta_k Z_k \tag{1}$$

where $\mathrm{BRER_{LR}}$ is the "long-run" level of the bilateral, CPI-based real exchange rate between the US and Mexico, there are k potential determinants Z_i, and to capture the long-run effects all the variables are measured in levels.

Following the bounds testing approach of Pesaran *et al.* (2001), Eqn. (1) can be estimated by means of an Autoregressive Distributed Lag (ARDL) model in error-correction form:

$$\Delta\mathrm{BRER}_t = \sum_{j=1}^{n} a_j \Delta\mathrm{BRER}_{t-j} + \sum_{i=1}^{k}\sum_{j=0}^{n} b_{i,j}\Delta Z_{i,t-j} + \sigma\mathrm{BRER}_{t-1} + \sum_{i=1}^{k} d_i Z_{i,t-1} + d_0 \tag{2}$$

where Δ indicates the first difference of the variable.

The estimation proceeds in two steps. The first one tests the statistical adequacy of the model. This requires determining the optimal number of lags for the first difference of the variables—resorting, for example, to Akaike's information