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Financial Globalization and Exchange Rates

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Abstract

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The founders of the Bretton Woods System 60 years ago were primarily concerned with orderly exchange rate adjustment in a world economy that was characterized by widespread restrictions on international capital mobility. In contrast, the rapid pace of financial globalization during recent years poses new challenges for the international monetary system. In particular, large gross cross-holdings of foreign assets and liabilities mean that the valuation channel of exchange rate adjustment has grown in importance, relative to the traditional trade balance channel. Accordingly, this paper empirically explores some of the interconnections between financial globalization and exchange rate adjustment and discusses the policy implications.

Contents   Page

Figures

I. INTRODUCTION

Financial globalization has been one of the most important trends in the world economy in recent decades. This process has involved sharply rising foreign asset and liability positions, whether scaled by GDP or by domestic financial variables (Lane and Milesi-Ferretti, 2003; Obstfeld and Taylor, 2004). In addition to larger gross positions, financial globalization has also allowed a greater dispersion in net foreign asset positions, with a significant number of countries emerging as either large net creditors or net debtors (Lane and Milesi-Ferretti; 2002a). In general, financial globalization is one of the key trends that has reshaped the global economy relative to the environment envisaged by the designers of the Bretton Woods system in 1944, and understanding its macroeconomic implications is crucial in formulating a view on the appropriate future direction for the international monetary system.

One consequence of financial globalization is that the international spillovers from asset price and currency movements have been enhanced. In addition to affecting the direction and magnitude of net capital flows, asset price dynamics also generate changes in the valuation of existing investment positions. For instance, the value of the net liability position of the United States is quite sensitive to relative movements in the U.S. versus non-U.S. equity markets and swings in the value of the dollar. Indeed, such valuation effects may be as important as current account imbalances in driving the dynamics of net foreign asset positions (Lane and Milesi-Ferretti, 2001a, 2002a; Gourinchas and Rey, 2004).

Of course, asset price and currency movements cannot be viewed as exogenous influences on the value of international investment positions, since shifting global demands for various assets and liabilities are an important driver of financial returns and exchange rates (e.g., through the determination of country and currency risk premia). Moreover, there is an obvious interplay between the financial and trade accounts that provides another link between net foreign asset positions and exchange rates: a long-term debtor may require real depreciation in order to generate the trade surpluses that are the counterpart of sustained net investment income outflows (Lane and Milesi-Ferretti, 2002b, 2004b).

In this paper we explore the interconnections between financial globalization and exchange rates. To establish the stylized facts about financial globalization, the first part of the paper examines trends in gross and net international investment positions and their components for a large set of advanced and emerging economies. In Lane and Milesi-Ferretti (2003) we documented for industrial countries an acceleration in the pace of financial globalization since the mid-1990s; in this paper we update our estimates of external assets and liabilities for a sample of emerging markets as well. [2] As noted above, a central aspect of our analysis is the focus on the factors explaining the changes in external positions: not only capital flows but also valuation effects, such as those caused by asset price and exchange rate fluctuations.

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[2] Lane and Milesi-Ferretti (2004c) explain the construction of the data.

In the second part of the paper we first provide an analytical framework that is useful in understanding the dynamics of net foreign assets, and then explore the contribution of currency movements to the revaluation component of net foreign asset dynamics. This relationship depends on a number of factors. For instance, the impact of an exchange rate depreciation will depend on gross foreign asset and liability holdings (in addition to the net position); the currency composition of both sides of the international balance sheet; and the co-movement between exchange rate changes and other financial returns.[3] These factors will vary across countries, according to the level of development, country size and other characteristics. Along one dimension, a high proportion of the liabilities of a major industrial country is likely to be denominated in its own currency, whereas a typical emerging market economy exhibits significant liability dollarization. Countries also differ as to the mix of short- and long-term debt and the levels of portfolio equity and FDI holdings in the international balance sheet: the impact of currency movements on the net external position is undoubtedly sensitive to the external capital structure.[4]

Our analysis suggests that theoretical work on open-economy macroeconomics should strive to incorporate elements such as persistent non-zero net foreign asset positions, large gross asset cross-holdings and mixed portfolios of equity and debt instruments, and illustrate why these features can make a difference to model dynamics and welfare analysis. Finally, in the last part of the paper we draw out the implications of our empirical work for policy analysis. In particular, we highlight that the valuation channel is unlikely to be open to policy manipulation on a sustainable basis.

II. TRENDS IN INTERNATIONAL FINANCIAL INTEGRATION

In Lane and Milesi-Ferretti (2002a, 2003), we documented a number of stylized features of international capital flows and external positions in industrial countries. Flows to and from such countries increased substantially in recent years, both in absolute terms and as shares of GDP and domestic wealth. In this context, the increase in FDI and portfolio equity investment is particularly noteworthy. The increase in gross external assets and liabilities means that valuation effects have become more important. We highlight these features again below with an updated dataset including both industrial countries and emerging markets.

A. Net Flows and Net Positions, Industrial Countries

Figure 1 plots net foreign assets (as a ratio of GDP) against GDP per capita, measured in current U.S. dollars, for the year 2003. There is a wide dispersion in net external positions among industrial countries, with Switzerland being by far the largest creditor, and New

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[3] Tille (2003) provides an interesting analysis for the United States.

[4] Lane and Milesi-Ferretti (2001b) analyze some of the determinants of the composition of the international balance sheet.

Zealand and Iceland the largest debtors in relation to GDP. The positive relation between net foreign assets and GDP per capita, shown in the figure to hold in the cross-section, holds also along the time-series dimension—as a country gets richer, relative to trading partners, its net foreign asset position tends to improve (Lane and Milesi-Ferretti, 2002a).

Table 1 summarizes net capital outflows from industrial countries over the period 1999–2003, together with changes in their external position. In absolute terms, Japan has been the largest capital exporter, while Switzerland and Norway had the highest net outflows relative to their GDP. On the other side, the United States had by far the largest net inflows in absolute terms, and also as a ratio of GDP.

While there is clearly a positive relation between net outflows and change in the net external position, the Table highlights the importance of valuation effects: for example, the United Kingdom was a net capital importer during this period, but its net external position improved by 7.5 percent of GDP; Canada instead was a net capital exporter, but its net position deteriorated. In absolute terms, the difference between net capital inflows and the change in the net asset position is particularly large for the United States—net inflows were over $600 billion higher than the accumulation of net liabilities. The reasons for this discrepancy are further discussed below.

B. Gross Flows and Gross Positions, Industrial Countries

Figure 2 summarizes the evolution of gross external assets and liabilities in industrial countries during the past 20 years. The growth in international financial interdependence is striking: during this period, aggregate assets and liabilities tripled as a share of GDP, FDI assets and liabilities increased four-fold, portfolio equity assets and liabilities six-fold, and debt assets and liabilities 2 ½ times. Focusing on the most recent period, the chart also shows the effects of the global decline in stock market valuations between end-1999 and end-2002, which is the main factor behind the reduction in the stock of portfolio equity assets and liabilities during this period, and the recovery in stock market valuation and flows in 2003.[5]

Table 2 summarizes gross capital flows to and from industrial countries during the most recent period (1999–2003). The size of gross flows is remarkable, particularly to and from financial centers such as Switzerland and the United Kingdom, but also to and from the euro area and, relative to GDP, Scandinavian countries. While net flows are also substantial, the data suggest that portfolio diversification, rather than intertemporal borrowing and lending, is the dominant motive for international asset transactions among industrial countries.

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[5] Only a few countries in our sample (including the United States) measure FDI at market value: hence, stock market fluctuations have a less dramatic impact on FDI stocks compared to portfolio equity holdings. Of course, the fall in foreign portfolio equity assets and liabilities relative to GDP does not imply a decline relative to total domestic equity holdings.

The data in Table 2 also confirm the importance of valuation effects, in addition to gross flows, in explaining the dynamics of external assets and liabilities. For example, external liabilities (and, to a lesser extent, assets) in the United States increased by substantially less than the underlying flows. The primary reason was the decline in U.S. stock market valuations during this period, which reduced the value of both foreign equity and FDI holdings in the United States. The smaller decline in stock market valuations (measured in U.S. dollars) in other countries during this period helps explain the smaller capital losses incurred by U.S. investors on their foreign equity holdings.[6]

C. Net Flows and Net Positions, Emerging Markets

We focus on a sample of 21 emerging markets (listed in the Appendix). Figure 3 plots the evolution of the average current account balance as a ratio of GDP in our sample. The key cycles in capital flows to emerging markets stand out clearly from this picture: the deterioration of current account imbalances in the late 1970s until the debt crisis, their sharp reversal during the remainder of the 1980s, the increase in imbalances during the early 1990s, and the new reversal following the 1994–95 Mexican crisis and especially the Asian crisis. Indeed, both the average and aggregate current account position of the emerging countries in our sample turned positive in 1998 and increased further in recent years.

The dynamics of the net external position, expressed as a ratio of GDP, are plotted in Figure 4. It shows the deterioration caused by the debt crisis and its aftermath, a subsequent sharp improvement, the stabilization of the net external position from 1990 to 1996, the deterioration caused by the sharp declines in GDP and real exchange depreciation characterizing the Asian crisis, and the subsequent improvement associated with current account surpluses and strengthening currencies in Asia. In the data, there is no evidence of an increased dispersion in current account balances across the countries in our sample (that is, there is a significant common trend in the net capital flows to this emerging market group), while the dispersion of the underlying net external positions has increased.

Figure 5 plots the net foreign asset position, scaled by GDP, in relation to GDP per capita in current U.S. dollars at end-2002. While there is still a positive relation between net foreign assets and GDP per capita, this relation is much weaker than for industrial countries. Indeed, creditors include economies with high GDP per capita, such as Taiwan Province of China, but also economies with much lower GDP per capita, such as Russia and Venezuela.[7]

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[6] The difference in stock market performance between the United States and world markets is entirely accounted for by the year 2003, during which the sharp depreciation of the U.S. dollar raised foreign stock returns measured in dollars. Between end-1998 and end-2002 the decline in stock market valuations in the United States and world markets was similar.

[7] In addition to the standard macroeconomic drivers of net foreign asset positions that were emphasized by Lane and Milesi-Ferretti (2002a), political risk and natural resource

(continued…)

Table 3 characterizes the size of net capital flows among some countries in our sample, both in absolute terms and as a ratio of GDP, during the period 1999–2003. The table shows a number of Latin American and Central European countries as the largest net recipients of net capital flows, although Turkey and Argentina experienced net outflows if IMF and "exceptional" financing are netted out. [8]As the data on current account dynamics suggest, a number of emerging markets—particularly Asian countries, together with Russia—have been on average net capital exporters, to a substantial degree. For example, Thailand's cumulative net outflows over the 5-year period total over 30 percent of its 2003 GDP.

D. Gross Flows and Gross Positions, Emerging Markets

Figure 6 provides a longer-term perspective on the size of external assets and liabilities in these emerging markets. Both assets and liabilities have increased substantially as a ratio to GDP during the past 20 years. However, there is virtually no increase in average external liabilities when scaled by exports, rather than GDP, while the trend increase in external assets is still visible. This stands in contrast with the evidence for the advanced economies, where the increase, especially since the mid-1990s, is very strong even as a share of exports.

As noted earlier, an interesting question is whether the composition of external assets and liabilities has changed over time. Table 4 provides evidence that highlights the increased relative importance of direct investment and portfolio equity liabilities. The averages hide substantial heterogeneity—countries such as Chile and the Central European economies in our sample (Czech Republic, Hungary, and Poland) have external equity liabilities above 50 percent of GDP, while the levels tend to be lower in Asian economies.

The table also documents the increase in foreign exchange reserves, expressed as a share of GDP, during the past 20 years. It should be noted, however, that this increase has gone hand in hand with the increase in other external assets, so that at the end of 2002 reserves in our sample account for the same share of total external assets as in 1982 (over one third). Direct investment and portfolio equity assets have also increased during the past two decades, and by 2002 represented around 12 percent of GDP and over 20 percent of total external assets.

Table 5 characterizes gross capital flows to and from some emerging economies during the period 1999–2003. The pattern reveals an interesting dichotomy. For a number of countries, gross flows primarily reflect intertemporal borrowing or lending decisions, with countries accumulating net assets or net liabilities—either cumulative inflows or cumulative outflows are clearly dominant (see also Table 3). Among countries that accumulated substantial net assets, a number of East Asian countries stand out, particularly Indonesia, Korea, Malaysia,

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endowments are other variables that may be important, especially in reference to the countries listed here.

[8] See IMF (1993) for a description of balance-of-payments transactions classified as exceptional financing.

and Thailand, together with oil-exporting countries such as Russia. For another group of countries, instead, gross inflows and gross outflows have both been large and roughly similar in magnitude, reflecting increased financial integration with the world economy. Examples include Chile and India. China has experienced large inflows and outflows, but also significant net foreign asset accumulation. Of course, similar aggregate levels of gross inflows and gross outflows can conceal significant net imbalances within specific asset categories: for instance, China is a major net recipient of FDI flows while simultaneously accumulating a significant volume of foreign reserves.

Having provided a broad characterization of the growth in international balance sheets in recent years for both advanced and emerging economies, we next turn to providing a simple framework for understanding the underlying drivers.

III. EXTERNAL ASSET DYNAMICS

In this section, we provide a simple accounting framework that relates the dynamics of net foreign assets to trade flows, growth, rates of return, and real exchange rates. The goal is to lay out the various channels by which exchange rates and other macroeconomic fundamentals can affect the external adjustment process. We then decompose the factors underlying changes in net foreign assets over the past decade for a set of emerging markets.

A. Accounting for External Asset Dynamics

The change in net foreign assets B can be written as the sum of net capital outflows and net capital gains:

$$B_t - B_{t-1} \equiv (\Delta FX_t - FA_t) + KG_t \tag{1}$$

where ΔFX_t is net accumulation of foreign exchange reserves, FA_t is net capital inflows (excluding reserves), and KG is the net capital gain on the net external position outstanding (change in stock minus underlying flow). Denote by CA the current account balance, KA the capital account balance, and EO net errors and omissions.[9] Making use of the basic balance of payments identity $CA + KA + FA - \Delta FX + EO \equiv 0$, we can re-write (1) as follows:

$$B_t - B_{t-1} \equiv CA_t + KA_t + EO_t + KG_t \tag{2}$$

In line with statistical reporting practices, all variables are expressed in U.S. dollars. Equation (2) can also be expressed as follows:

$$B_t - B_{t-1} \equiv BGST_t + (KA_t + EO_t) + (i_t^A A_{t-1} - i_t^L L_{t-1} + KG_t) \tag{3}$$

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[9] In balance of payments statistics (IMF, 1993) the so-called 'capital account' measures certain transfers (such as debt forgiveness); capital flows are recorded in the financial account.

where *BGST* is the balance of trade in goods and services plus net transfers, *A* and *L* are external assets and liabilities, respectively, and i_t^A, i_t^L are the nominal yields on these assets and liabilities.

Taking ratios of GDP and indicating such ratios with lower-case letters, we can express (3) as follows:

$$b_t - b_{t-1} \equiv bgst_t + (ka_t + eo_t) + \frac{i_t^A A_{t-1} - i_t^L L_{t-1} + KG_t}{Y_t^\$} - \frac{\gamma_t}{1+\gamma_t} b_{t-1} \tag{4}$$

where γ_t is the growth rate of nominal GDP measured in U.S. dollars. Another way to re-write the above expression is as follows:

$$b_t - b_{t-1} \equiv ca_t + \frac{KG_t}{Y_t^\$} + (ka_t + eo_t) - \left[\frac{\pi_t - d_t}{(1+g_t)(1+\pi_t)}\right] b_{t-1} - \frac{g_t}{1+g_t} b_{t-1} \tag{5}$$

where *g* is the economy's real growth rate, π is the rate of inflation (measured with the GDP deflator), and *d* is the rate of nominal exchange rate depreciation vis-à-vis the U.S. dollar. In other words, changes in the net external position can be due to several factors:

1. the current account;
2. net capital gains (measured in U.S. dollars);
3. the capital account and net errors and omissions;
4. the effect of exchange rate changes on the past net foreign asset position; [10]
5. the effect of real GDP growth on the past net foreign asset position.

An alternative way to express equation (5) is in terms of overall rates of return on external assets and liabilities. Define $k_t^A(k_t^L)$ as the rate of capital gain on external assets (liabilities), measured in U.S. dollars, so that $k_t^A A_{t-1} - k_t^L L_{t-1} = KG_t$, and let $\hat{r}_t^A = \frac{1+i_t^A+k_t^A}{1+\pi_t^{US}}$ be the real rate of return on foreign assets, measured in U.S. dollars, with an analogous definition

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[10] If external assets and liabilities are all denominated in domestic currency, the capital gain effect will go exactly in the opposite direction from the exchange rate change effect. Indeed, assume for simplicity that asset prices in domestic currency do not change. In this case, the capital gain expressed in domestic currency is zero, but expressed in dollars it becomes $\frac{KG_t}{Y_t^\$} = -\frac{d_t}{(1+\pi_t)(1+g_t)} b_{t-1}$, similar (with an opposite sign) to the term $-\frac{\pi_t - d_t}{(1+g_t)(1+\pi_t)} b_{t-1}$ in equation (5).

holding for the rate of return on foreign liabilities $\hat{r}_t^L$. In this case we can re-write (5) as follows:

$$b_t - b_{t-1} \equiv bgst_t + (ka_t + eo_t) + \frac{\hat{r}_t^L - g_t - \varepsilon_t(1+g_t)}{(1+g_t)(1+\varepsilon_t)} b_{t-1} + \frac{\hat{r}_t^A - \hat{r}_t^L}{(1+g_t)(1+\varepsilon_t)} a_{t-1} \qquad (6)$$

Equation (6) shows several factors that can account for the dynamics of net foreign assets: the adjusted trade balance, the difference between the real rate of return and the growth rate, adjusted for the bilateral real exchange rate vis-à-vis the U.S. dollar, and differences in returns between foreign assets and liabilities.

If we express real rates of return in domestic currency and denote them by r_t^A, r_t^L, equation (6) takes the more familiar form:

$$b_t - b_{t-1} \equiv bgst_t + (ka_t + eo_t) + \frac{r_t^L - g_t}{1+g_t} b_{t-1} + \frac{r_t^A - r_t^L}{1+g_t} a_{t-1} \qquad (7)$$

This framework delivers several important insights. First, the gap between current production and current absorption (i.e. the trade balance) is only one factor in determining the aggregate evolution of the net foreign asset position: it is vital to also keep track of valuation and "denominator" effects. Second, as is shown by the third term on the right hand side (RHS) of equation (6), the difference between the rate of return and the growth rate, interacted with the inherited net foreign asset position, exerts a potentially powerful influence on its current dynamics. Third, as captured by the last term on the RHS in equation (6), the gross scale of the international balance sheet matters in addition to the net position: even if the inherited net foreign asset position is zero, the accumulated levels of gross foreign assets and liabilities will influence the overall dynamics to the extent that the rates of return differ between the two sides of the international balance sheet.

B. The Evolution of Net Foreign Assets in Emerging Markets

In Table 6 we provide a simple decomposition of changes in the ratio of net foreign assets to GDP between end-1990 and end-2002 for a selection of emerging markets in our sample. The breakdown follows equation (4), so that changes in net foreign assets are given by the sum of the current account (itself divided into trade balance and investment income), capital account and errors and omissions, capital gains (including the effects of exchange rate changes on the net external position), and the effects of growth on net external assets.

A number of features are worth highlighting:

- despite a cumulative current account in balance or surplus, countries such as Indonesia and Thailand experienced a deterioration in the ratio of net foreign assets to GDP. For both countries, this occurred because of 'capital losses'—linked to the real depreciation of their currencies during the period.

- On the other side, the Czech Republic's and Mexico's external position deteriorated by much less than the large cumulative current account deficits would suggest, thanks to substantial capital gains on their net external position—linked to the real appreciation of their currencies between end-1990 and end-2002.

More generally, the Tables highlight the need to focus not only on the current account (which includes the yield on external assets and liabilities), but also on economic growth and the overall rates of return on the external portfolio in order to understand the evolution of net foreign assets. Indeed, growth and especially valuation effects can have an impact on the evolution of the external position that is of the same order of magnitude as trade imbalances.

IV. EXCHANGE RATES AND THE ADJUSTMENT PROCESS

The framework summarized in equation (6) highlights the potential contribution of shifts in exchange rates in determining the dynamics of external asset positions. In this section, we first briefly review the "traditional" channels by which exchange rates influence the adjustment process, before focusing on the valuation channel (i.e. the impact of the exchange rate on the rates of return earned on holdings of foreign assets and liabilities).

A. Exchange Rates, the Trade Balance and Real Output

The interconnection between the exchange rate and the trade balance is among the most-studied questions in international economics, in both academic and policy circles. From a long-run perspective, the classical transfer problem postulates that persistent creditor nations should have more appreciated real exchange rates. The mechanism underlying the transfer problem hypothesis is that the positive international investment returns earned by long-run creditors have their counterpart in trade deficits and attendant real appreciation.

Lane and Milesi-Ferretti (2002b, 2004b) find considerable empirical support for the transfer problem, for both industrial and developing countries. However, they find the magnitude of the effect differs with country characteristics such as openness, size and the level of development. In relation to financial globalization, important findings are that the transfer problem is smaller in the absence of current and capital account restrictions and that equity financing reduces the size of the transfer effect relative to debt financing.

At a shorter horizon, the interplay between the exchange rate and the trade balance is complex and less well understood. In particular, the cyclical correlation between the variables will depend on the nature of the shocks hitting the economy, with nominal, fiscal and real shocks generating different co-movement patterns between the variables. However, in policy terms, there is a broad consensus that exchange rate depreciation is typically required if the objective is to engineer an improvement in the trade balance. Empirical studies of the elasticities of trade volumes to exchange rates and income levels provide extensive support for this proposition (Hooper et al 2000). Again, the pace of financial globalization and "real" globalization (in terms of product market integration) will influence these key elasticities. For instance, the scale of exchange rate adjustment is eased, as foreign

goods become better substitutes for domestic goods. In terms of financial globalization, wider trade imbalances are more feasible, the more diversified are international portfolios.

In tracking the dynamics of the ratio of net foreign assets to GDP, real exchange rates also operate by determining the real value of domestic output in terms of international price comparisons. For instance, if variables are measured in U.S. dollars, a foreign asset that is constant in real dollar terms will shrink relative to the constant-dollar value of GDP if real appreciation vis-à-vis the U.S. dollar occurs. This "denominator" effect is highlighted in equation (8) in the previous section and is powerful channel by which the real exchange rate may influence the dynamics of the Net Foreign Assets (NFA)/GDP ratio.

However, in addition to these well-known channels, exchange rates also potentially influence the dynamics of international asset holdings through influencing the rates of return on foreign assets and liabilities.[11] We focus on this valuation channel in the rest of this section.

B. The Valuation Channel: A Conceptual Framework

As outlined earlier in the paper, the dynamics of net foreign assets depend not only on the trade balance but also on the rates of return earned on accumulated foreign assets and paid out on foreign liabilities. In domestic-currency real terms, the net impact is given by

$$NETRET_t = r_t^A A_{t-1} - r_t^L L_{t-1} \tag{8}$$

where the stocks of foreign assets and liabilities A and L are now expressed in domestic currency. Since these positions are predetermined from a time-t perspective, the net valuation impact of a change in the real exchange rate is given by

$$\frac{\partial NETRET_t}{\partial RER_t} = \frac{\partial r_t^A}{\partial RER_t} A_{t-1} - \frac{\partial r_t^L}{\partial RER_t} L_{t-1} \tag{9}$$

It is clear from this expression that exchange rate changes can have a non-zero valuation impact even if the initial net foreign asset position is balanced, so long as the rates of return on foreign assets and liabilities are differentially affected by a shift in the exchange rate.[12]

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[11] Clearly, in tracking a ratio, there is some discretion in terms of attributing the impact of an exchange rate change to the numerator or the denominator via the choice of the reference currency. In the next subsection, we look at the levels of foreign assets and liabilities in terms of real domestic currency.

[12] Strictly speaking, the impact on the returns on foreign assets and liabilities is not the only "valuation" effect of exchange rate changes. As highlighted by the debate over the Marshall-Lerner condition and re-emphasized by the current debate about limited exchange rate pass-through, exchange rate movements also exert a "pure" valuation effect on the trade balance to the extent that import and export volumes are unresponsive to exchange rate changes.

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The magnitude of the valuation channel is directly increasing in the gross scale of the international balance sheet: the relevance of this channel for aggregate net foreign asset dynamics is growing in line with the spectacular accumulation of gross foreign asset and liability holdings in recent years. Relatedly, the valuation channel also depends on the composition of the international balance sheet, since the sensitivity of returns to exchange rates will vary across investment categories and will also depend on the currency composition of foreign assets and liabilities (and on the extent of hedging).

Of course, even if the exchange rate does indeed have a valuation impact, it does not mean that the net foreign asset position will move one-for-one. First, exchange rate changes also have a direct impact on the trade balance. Second, a valuation gain entails represents a positive wealth effect that will plausibly raise consumption and investment, leading to a negative co-movement between the net returns term and the trade balance (Lane and Milesi-Ferretti 2002a, 2002b). Third, from another angle, a sufficiently- large negative valuation effect may lead to a sudden stop in capital flows that forces the trade balance to move into surplus. Finally, it is important to remember that it is the net valuation effect that matters: a capital gain on foreign assets may be fully offset by a capital gain on foreign liabilities.[13]

In addition, equation (9) only captures the contemporaneous impact of a change in the exchange rate. Some returns may respond to the exchange rate only with a lag (for instance, the future profitability of FDI positions may be affected by current exchange rate movements). In addition, current exchange rate movements may lead to a revision of expectations about future exchange rate changes, which in turn feed into the ex-ante returns required to hold particular foreign asset and liability positions.

As was discussed earlier in the paper, there are polar cases in which the impact of exchange rate movements on rates of return is straightforward. For instance, the domestic rate of return on an unhedged foreign asset that offers a fixed foreign-currency return will fall one-for-one with the rate of real appreciation: a given foreign-currency return will be diminished by the fall in the real domestic value of foreign currency. Conversely, the domestic rate of return on a foreign liability that offers a fixed domestic-currency return will be unaffected by a shift in the real exchange rate. However, the domestic rate of return on a foreign liability that offers a fixed foreign-currency return (e.g. foreign currency debt or domestic debt that offers a dollar-linked rate of return) will also fall in proportion to the rate of real appreciation.

There are also potential valuation effects even on domestically owned assets, but we restrict attention to the cross-border positions through which valuation effects have asymmetric redistribution effects on home and foreign investors.

[13] Cross-border hedging could automatically generate such a positive comovement. However, the extent to which hedging takes place is unclear: much hedging activity occurs between counterparties of the same nationality, with no net impact on the national risk profile.

More generally, the net impact of exchange rate movements on the value of holdings that carry a variable market return depends on the nature of the co-movements between exchange rates, asset prices and profitability (in the case of non-market assets such as FDI positions and some bank claims). In some cases, the inter-connections between exchange rates and the determinants of market returns can be quite subtle and complex and may also depend on the underlying source of an exchange rate shock.

For instance, devaluation may be associated with an increase in the rate of return on foreign liabilities if it is associated with an increase in the profitability of foreign affiliates operating in the domestic market or, alternatively, if it engenders an increase in the country risk premium. On the other hand, a devaluation may be generated by a negative domestic productivity shock that also lowers the return earned by foreign investors. With respect to foreign assets, domestic real depreciation may be the result of superior overseas economic performance that raises the overseas rate of return. However, a negative domestic productivity shock may also reduce the overseas earnings of domestic multinationals, such that devaluation is accompanied by a decline in the overseas rate of return.[14]

In view of the range of possible theoretical scenarios, the strength of the valuation channel is ultimately an empirical issue. We first consider some case study evidence, before turning to cross-country quantitative exploration in the subsequent subsection.

C. Case Studies: The United States and Australia

It is possible to gain some insight into the quantitative importance of the valuation impact of exchange rate movements for those countries that calculate the accounting decomposition about the relative importance of capital flows, market value capital gains, and exchange rate capital gains in determining the dynamics of foreign asset and liability positions. This is possible for two countries in our sample (the United States and Australia). Of course, an accounting decomposition does not reveal the complete contribution of the exchange rate valuation channel, since it does not take into account the potential indirect impact of the exchange rate on market values or on the revaluation of investment income flows.

Tables 7 and 8 present the decompositions for the United States and Australia respectively, showing the average annual relative contributions of each component in proportion to the inherited stocks of foreign assets (liabilities):

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[14] A further complication is that exchange rate movements may also affect the international tax planning of multinational corporations that may affect the distribution of reported earnings in different locations. See Sullivan (2004) on the trend increase in the shifting of reported profits by U.S. multinationals to overseas affiliates.

$$CON\_FLOW_{FAt} = \frac{CAPFLOW_{FAt}}{FA_{t-1}}$$

$$CON\_MV_{FAt} = \frac{KG\_MV_{FAt}}{FA_{t-1}}$$

$$CON\_ER_{FAt} = \frac{KG\_ER_{FAt}}{FA_{t-1}}$$

In addition, the tables display the standard deviations for these components. Figure 7 and Figure 8 present similar data, but scale the size of capital flows and valuation changes by GDP, so as to provide a ready reckoning of their macroeconomic impact.

Table 7 and Figure 7 show the statistics for the United States over 1990–2003. While financial flows have traditionally been the dominant source of balance sheet growth, the 1996–2003 period saw a much greater role for capital gains. Indeed, the contribution of market-value capital gains exceeded that of financial flows in the growth of the foreign asset holdings of the United States during the global stock market boom of 1995–1999, with a similar contribution to the growth in the value of foreign liabilities. Conversely, and consistently with the evidence in Tables 1 and 2, the global correction in asset prices during 2000–2003 saw a decline in the market value of both foreign assets and liabilities.

Table 7 highlights the role of the exchange rate valuation channel. The 5.1 percent average annual dollar appreciation during 1996–2001 was associated with an annual average 1.7 percent fall in the value of U.S. foreign assets. In contrast, the sharp dollar depreciation during 2002–03 was associated with an annual average 5.5 percent increase in its foreign asset position. This gain helped to offset the impact of the growing current account deficit on the U.S. net external position. (Throughout, in line with expectations, the exchange rate channel had a near-zero impact on the stock of U.S. foreign liabilities.) In terms of relative stability, capital flows have been much less volatile than either of the capital gain components.

Turning now to the Australian evidence, Table 8 and Figure 8 show that the exchange rate valuation channel has been more important than in the U.S. case. For instance, the exchange rate valuation term was a bigger contributor than either financial flows or market-value capital gains in the growth of foreign assets during the 1997.Q2–2001.Q1 period of real depreciation of the Australian dollar. Although, in contrast to the U.S. case, Australian foreign liabilities are also sensitive to the exchange rate, this side of the international balance sheet is only about half as sensitive as the foreign asset position. This is consistent with a larger role for holdings denominated in domestic currency in foreign liabilities than in foreign assets.

These case studies of the United States and Australia provide suggestive evidence about the importance of the valuation channel in driving fluctuations in international asset holdings.

We next turn to regression-based analysis for a broader panel of countries.

D. Regression Analysis, Industrial Countries

In this section, we analyze the sensitivity of rates of return on foreign assets and liabilities to movements in trade-weighted multilateral exchange rates.[15] In addition to the aggregate positions, we also examine returns for the separate investment categories (FDI; portfolio equity; portfolio debt; and other (debt)), since the relation between exchange rate movements and rates of return should depend on the specific characteristics of each investment class.

Our specification is given by

$$r_{it}^A = \alpha + \beta \Delta \log(rer_{it}) + u_{it} \tag{10}$$

where the dependent variable is the real domestic-currency return on foreign assets in investment category i and the regressor is the log change in the trade-weighted real effective exchange rate.[16] We run an analogous equation for the rate of return on foreign liabilities.[17]

Our primary interest is just in establishing the direction and magnitude of the contemporaneous co-movement between the exchange rate and rates of return.[18] We do not attempt to distinguish between anticipated and unanticipated changes in the real exchange rate: however, real exchange rates are largely unpredictable at an annual horizon (at least for our sample of advanced countries), such that this may be a fairly-innocuous assumption.[19]

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[15] While the most appropriate real exchange rate measure would be a "finance-weighted" index, reflecting the relative importance of host or source countries in external holdings, the strong correlation between the geographical pattern of trade and financial flows ensures that a trade-weighted exchange rate is a reasonable proxy.

[16] The rate of return on foreign assets in year t is measured as the sum of investment income and capital gains earned in that year, divided by foreign assets at the end of year $t-1$.

[17] Clearly, this is a very parsimonious setup. However, in addition to being suited to our short data span, capturing the simple bivariate relation is an obvious first step, even if it does not rule out the possibility that any impact of the exchange rate on the rate of return may just be proxying for the role played by some omitted variable that commonly influences both the rate of return and the exchange rate or may just reflect endogeneity bias.

[18] We could alternatively present the simple correlations between returns and exchange rate changes. See Lane and Milesi-Ferretti (2003).

[19] We return to the issue of the predictability of exchange rates in the discussion of results.

We begin by examining the rates of return on foreign assets in Table 9.[20] The results for total foreign assets are given in column (1). In all cases, the estimated coefficient is negative: real appreciation is associated with a fall in the domestic-currency rate of return earned on foreign assets. For a number of countries, the estimated coefficient is in fact very close to -1: this one-to-one mapping is consistent with a process by which the foreign-currency real return on foreign assets is orthogonally determined and the exchange rate just acts to convert the foreign-currency return into domestic terms.[21]

The smallest estimated coefficient (in absolute value) in the sample is for the U.S. at -0.37. This admits a number of interpretations. First, some proportion of U.S. foreign assets is denominated in dollars and hence their value is not directly affected by exchange rate movements. Second, dollar appreciation could be associated with an increase in returns on foreign-currency foreign assets. One example would be a positive productivity shock in the U.S. that both appreciates the dollar and raises returns in U.S. financial markets. If foreign financial markets positively co-move with the U.S., foreign-currency asset returns would also rise at the same time. A positive U.S. productivity shock could also raise the profits earned overseas by U.S. multinationals, such that foreign-currency return rises in that case as well.

The results for FDI assets are given in column (2).[22] For most countries, FDI positions are still measured at book value, rather than market value, and therefore the valuation channel is typically understated. However, currency movements should still matter, since these would affect factors such as the current replacement cost of capital goods and fixtures, both domestically and overseas. In column (2), the fixed-effects panel estimate of the impact of

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[20] In terms of country selection for the regressions, we only include those with at least thirteen years of data on rates of return. In addition, we rule out observations that may be contaminated by factors such as revisions in methodology and other corrections.

[21] In some cases, we observe a coefficient above unity, which means that real appreciation is associated with a fall in foreign-currency returns on foreign assets: the domestic investor "loses twice" by suffering both a low foreign-currency return and an unfavorable conversion rate back into domestic real terms. Such a pattern could be generated, for instance, if the domestic business cycle is asymmetric with respect to the international business cycle: the domestic currency appreciates when international partners are doing badly (as proxied by poor foreign-currency rates of return). This, of course, is a risk-leveraging pattern of co-movement between foreign-currency returns and the domestic real exchange rate.

[22] In the sample represented in this table, only the Netherlands and Australia record FDI at market value. The United States reports positions measured at both book and market value. For comparability with the countries that only report book values, the U.S. estimates in these tables refer only to the book value measure of FDI. However, for the United States, if we use the rate of return based on FDI at market value then the exchange rate coefficient in the FDI asset equation is -0.71 (t-stat 1.38) and it is 0.15 (t-stat 0.37) in the FDI liability equation.

real appreciation on the real return on FDI foreign assets is -0.76. However, there are some cases in which the coefficient is substantially above unity: for these countries, real appreciation tends to be associated with low foreign-currency real returns on FDI assets.

We next examine the returns on portfolio equity assets in column (3). The fixed-effects panel estimate is very close to -1, which is consistent with orthogonal contributions of exchange rate movements and foreign-currency rates of return to the domestic-currency real rate of return. Two exceptions to this rule are Germany and Switzerland: for these countries, real appreciations have coincided on average with periods of strongly negative world stock market returns, and hence disappointing foreign-currency returns on their equity portfolios.

Column (4) displays the results for foreign assets in the portfolio debt category. There is strong covariation between the exchange rate and domestic-currency returns is typically quite good and the estimated coefficients are consistent with the foreign-currency returns on foreign portfolio debt assets being exogenously determined with respect to the domestic real exchange rate. However, the U.S. coefficient is only -0.65, consistent with the fact that a considerable proportion of its foreign bond holdings are denominated in US dollars.

Finally, we turn to the "other" investment category in column (5). This category largely comprises bank lending. Since banks do not "mark to market" all assets and liabilities but rather carry a high proportion at book value, the rates of returns in this category will be dominated by the yield component, with capital gains and losses understated. However, on the assets side, the broad picture is quite similar to that for portfolio debt. Again, an important exception is the United States, where the coefficient estimate is insignificant: again, a good candidate explanation is that a high proportion of its foreign lending is in U.S. dollars.

We turn to the rates of return on foreign liabilities in Table 10. In terms of the results for total foreign liabilities in column (1), we see quite a mixed pattern in terms of the estimated exchange rate coefficients across countries. As was shown also in Table 7, For the United States, the rate of return paid out on foreign liabilities is totally unaffected by movements in the real exchange rate—consistent with the fact that foreign liabilities are almost entirely dollar-denominated and offer returns that not linked to exchange rate fluctuations (e.g. bank deposits or fixed-interest debt instruments). At the other extreme, the estimated coefficient for Finland is -1.8.[23] The fixed-effects panel estimate is -0.68: this generally indicates that

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[23] Albeit significant only at the 10 percent level. Although a pattern of high real returns plus exchange rate depreciation is also evident in the early 1990s, the most striking period for Finland is the post-EMU 1999–2002 period: in 1999 the return on its foreign liabilities was large (driven by gains in Nokia's share price during the equity market boom), while its real exchange rate depreciated (on account of the fall in the external value of the euro). In contrast, the stock market reversals of 2001–2002 were accompanied by an appreciating real exchange rate (as the euro's external value recovered). This case is a vivid illustration of the importance of co-movements between exchange rates and asset prices. It also underlines that

(continued…)

exchange rate appreciation is associated with some deterioration in domestic real returns on foreign liabilities.[24]

With respect to FDI liabilities, column (2) of Table 10 suggests that there is little covariation between exchange rate fluctuations and real domestic returns. In part, this may be attributed to the fact that FDI positions are mostly measured at book value but the insignificance of the exchange rate also suggests that the earnings of foreign affiliates in the domestic market are not (contemporaneously) affected by exchange rate swings. This pattern is worth exploring further but would require the availability of higher-quality data. Similar to the case for FDI liabilities, most of the estimated country coefficients for portfolio equity liabilities are insignificantly different from zero: the domestic-currency real return offered by portfolio equity liabilities is not systematically affected by the exchange rate. Again, this is somewhat surprising to the extent that we might expect domestic stock market booms to be associated with real appreciation.[25]

Only Canada and Australia show a significant connection between exchange rate movements and the rate of return paid out on foreign bond liabilities. For the others, the results support the caricature of bond liabilities that offer a domestic rate of return that is invariant to exchange rate fluctuations.[26] With respect to other liabilities, a number of countries display

exchange rates need not always move in a "risk-sharing" manner, which applies *a fortiori* for members of a currency union that have little influence on the external value of the currency.

[24] In no case is the estimated coefficient significantly positive. This is quite surprising, since some of the mechanisms discussed earlier in order to explain a negative relation between exchange rate appreciation and the rate of return on foreign assets should symmetrically imply a positive association between exchange rate appreciation and the rate of return on foreign liabilities. For instance, a positive domestic productivity shock might raise profitability of foreign affiliates operating in the domestic market and generally boost domestic asset prices, while at the same time generating real appreciation.

[25] Indeed, there is only one significant country coefficient (Germany), but it is negative and large (-2.9) negative. This means that declines in the German stock market are typically associated with real appreciation. Since the point coefficient is fairly similar for both assets and liabilities, this implies that German real appreciation tends to occur during phases of disappointing global stock returns, since the returns on German overseas assets fall in addition to the returns paid out on domestic stocks owned by foreign investors.

[26] Even for Canada and Australia, the pattern of comovement is negative: real appreciation is associated with low domestic rates of return on their foreign bond liabilities. In part, this may suggest that exchange rate movements for these countries have a substantial predictable component, since foreign investors would be prepared to accept a low domestic-currency

(continued…)

significantly negative coefficients, with the estimates far above unity for Australia and Spain. For this pair, the pattern is akin to that experienced by emerging markets: real depreciation is associated with an increase in the foreign-currency return paid to foreign investors.

In summary, the regression analysis in Tables 9 and 10 delivers a number of interesting lessons. First, especially on the foreign assets side, exchange rate movements are an important covariate of rates of return, consistent with the operation of a powerful valuation channel. Second, real appreciation is typically associated not only with lower real returns on foreign assets, but also lower real returns on foreign liabilities: at least for small net positions, this implies that the net valuation impact of exchange rate movements on the net foreign asset position has been limited. Third, the sensitivity of returns to exchange rates does vary across investment categories: the composition of the international balance sheet is an important determinant of the aggregate valuation effect. Fourth, the United States behaves from quite differently other countries in that the rates of return on its liabilities (in all investment categories) are unaffected by currency movements. Since dollar depreciation raises the return on its foreign assets, this means that the valuation channel in the U.S. case may indeed be a powerful adjustment mechanism in correcting its large external liability position. We return to the feasibility of this option later in this paper.

E. Exchange Rates and Rates of Return, Emerging Markets

In general, we would expect the relation between domestic-currency rates of return and changes in the real exchange rate to be even stronger for emerging markets, which in general have less scope for borrowing or lending in domestic currency. Careful empirical work has to face the severe difficulties in measuring such rates of return: among these, the lack of precise historical data on international investment positions; stock-flow discrepancies; debt reduction and debt forgiveness agreements, and default episodes.

While aware of these limitations, we have constructed rough estimates of rates of return on external assets and liabilities for our emerging-market sample. The methodology is based on estimating the stock of external assets and liabilities (Lane and Milesi-Ferretti, 2004c), and using data on interest payments and capital flows to back out rates of return.

A simple panel regression with fixed effects of real domestic-currency rates of return on external liabilities on changes in the real effective exchange rate gives a coefficient of -0.86

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return if real appreciation were anticipated. The predictability hypothesis receives some support from the empirical work of Chen and Rogoff (2003), who show that "commodity" currencies (such as the Australian and Canadian dollars) are more predictable than other currencies. Of course, another potential contributory factor is the extent to which these countries issue bond liabilities in foreign currency.

with a t-statistic of 19.[27] As Figure 9 shows, this relation holds not only along the time-series dimension, but also in the cross-section. The Figure shows a strong negative relation (plotted for the year 1997, a year of large exchange rate depreciations in the Asian countries of our sample) between the domestic currency rate of return on external liabilities and the real effective exchange rate.

F. The Valuation Channel in International Macroeconomic Models

The preceding empirical analysis has indicated that revaluations are an important contributor to net foreign asset dynamics. However, it has been standard in both the traditional Mundell-Fleming approach and contemporary "new open economy macroeconomics" to consider scenarios in which the initial net foreign asset position is zero and the gross scale of international balance sheets is ignored. This rules out any consideration of the valuation channel in terms of macroeconomic behavior and the analysis of alternative policies.

However, two important recent exceptions are provided by Benigno (2001) and Tille (2004). In a two-country model, Benigno (2001) shows that monetary shocks have much larger real effects if the initial global steady state is characterized by imbalances in net external positions, since exchange rate movements generate a net valuation effect that has asymmetric effects on home and foreign countries. One implication is that countries will disagree about the optimal monetary policy, since the valuation channel acts to transfer wealth between home and foreign citizens.

Tille (2004) considers the case of initially-balanced net foreign positions but allows for different levels of scale in terms of gross holdings of foreign assets and liabilities. Matching the U.S. data, he shows that an increase in gross cross-holdings of domestic-currency and foreign-currency bonds means that the welfare impact of a surprise monetary expansion is greatly magnified in the case that the foreign-currency share of foreign assets is larger than the foreign-currency share of foreign liabilities. Indeed, his calibration suggests that the welfare impact of the valuation channel is 350 percent more powerful than the traditional channel, since devaluation confers a sizeable capital gain on the home country in his setup.

Clearly, much remains to be done to improve the theoretical treatment of the valuation channel in macroeconomic models. For instance, it would be highly desirable (albeit extremely challenging) to incorporate a realistic profile of the international balance sheet (with its mix of FDI, portfolio equity and debt instruments) and jointly determine the equilibrium response of real variables, asset prices and exchange rates to various shocks and policies. In this regard, Hau and Rey (2003) and Pavlova and Rigobon (2003) have made interesting recent attempts to jointly model financial returns and exchange rates.

Finally, another important research question is to assess the contribution of the valuation

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[27] A similar regression for assets gives a coefficient of -1, consistent with the fact that overseas assets are entirely denominated in foreign currency.

channel to persistent shifts in net foreign assets. That is, the valuation effects induced by currency and asset price movements can generate volatility in the value of external assets and liabilities but it is an open question as to how important are valuation effects versus current account imbalances in driving the lower-frequency component of net foreign asset dynamics. On the agenda for future research is a better characterization of the relation between exchange rate movements and net foreign asset positions over time: for instance, the impact effect may primarily operate through the valuation channel, with a longer-term contribution via gradual adjustment in the current account to a sustained real exchange rate movement.

V. POLICY IMPLICATIONS

As was emphasized in discussing equation (6) above, financial globalization increases the empirical relevance of the valuation channel for exchange rate movements. Improving quantitative understanding of the valuation channel is obviously desirable, in order to keep better track of the dynamics of net foreign assets and international wealth effects. One helpful innovation would be for the relevant national statistical agencies to collect more information on the role played by currency movements in determining rates of return on foreign assets and liabilities.

From a policy perspective, does the valuation channel offer a reliable method to address an excessive net external liability position? Gourinchas and Rey (2004) provide some evidence for the United States that historical adjustment in its net foreign asset position has indeed in part relied on the valuation channel, with the exchange rate responding in a predictable, systematic manner during phases when its external position was "unsustainable."

However, there is good reason to be skeptical that the valuation channel can be relied upon to solve adjustment problems. Even for those countries for which a one-time surprise devaluation may indeed generate a positive valuation effect that improves the net foreign asset position, such a move would involve a reputational cost: future investors would require a larger premium in order to compensate for the risk of subsequent devaluations. Indeed, such manipulation of the exchange rate creates a classic time-consistency problem, with the standard recommendation that policymakers take steps to commit to not using the devaluation option as a form of capital levy. While the severity of this problem is one of the underlying factors behind the prevalence of liability dollarization and short-maturity debt among the emerging market nations, it may yet have an increasing bite for major debtors among the advanced nations.[28]

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[28] Alberola (2003) discuss the impact of liability dollarization on the path of exchange-rate adjustment in emerging markets. He argues that the real exchange rate will tend to overshoot its equilibrium level, due to the need to foster higher current account surpluses in the aftermath of depreciation to make up for to the increase in liabilities.

Moreover, as has been highlighted repeatedly in this paper, it is important to recognize that the United States is a special case, in view of its ability to issue a large proportion of its liabilities in dollars. This capacity is related to the dollar's status as the default reserve currency and "safe haven." In turn, the dollar status helps explain the systematic positive difference between the rate of return gained on U.S. external assets and the one paid out on its liabilities. Nevertheless, further substantial increases in the U.S. net debtor position would raise the prospect of a substantial U.S. dollar depreciation, with the associated capital losses inflicted on U.S. creditors. In turn, this may threaten the special status of the dollar, also in light of the emergence of the euro as an alternative international reserve currency, and raise the rate of return required by foreign investors on dollar instruments.

It is interesting to speculate on the trend implications of financial globalization for exchange rate volatility. Along one dimension, if financial globalization improves international risk sharing, then more similar wealth dynamics could lead to more correlated aggregate demand patterns and thereby reduce the need for exchange rate shifts. However, as has been recently emphasized by Kalemli-Ozcan et al (2003) and Heathcote and Perri (2004), greater cross-border risk-sharing could also permit increased specialization in production, with sectoral shocks under that scenario translating into greater real exchange rate variability.

Along another dimension, the diversification of risks afforded by financial globalization may also permit greater dispersion in net foreign asset positions, through a weakening of the association between external imbalances and country risk premia. If that is the case and the pace of "real" globalization (i.e. the international integration of product markets) does not proceed sufficiently quickly, then large-scale real exchange rate movements may increase in frequency, as part of the adjustment process in coping with enlarged global imbalances.

In light of these opposing forces, it is difficult to make a firm prediction about the net impact of ongoing financial globalization on exchange rate volatility. In turn, while financial globalization shifts the terms of the debate about the relative merits of alternative exchange rate systems, it does not obviously tilt the balance in one direction or the other in deciding between floating and fixed regimes.

Of course, the acceleration of financial globalization in the 1990s also had a large impact on exchange rates, by arguably increasing the prevalence and severity of currency and financial crises. The policy response to the 1990s series of crises has been to emphasize the importance of adequate domestic financial regulation, the fragility of pegged exchange rates and robust fiscal control. However, our emphasis on the roles played by exchange rates and rates of return in driving net foreign asset dynamics also raises the question of whether national governments should seek to mold the international balance sheet in some fashion, either directly or by providing incentives to the private sector to insure against particular financial vulnerabilities. The rapid growth in official external reserves in many countries in recent years can be interpreted as one response to the risks associated with financial globalization. In addition, increased direct investment and portfolio equity flows can in principle improve risk-sharing by tying rates of return on external liabilities to domestic

macroeconomic conditions. Although the literature is expanding rapidly, more research on this question is clearly needed.

VI. CONCLUDING REMARKS

This paper has been concerned with the macroeconomic implications of financial globalization. Having established recent patterns in terms of gross and net international asset trade for both advanced and emerging market economies, we have shown that the dynamics of net foreign asset positions crucially depend on an array of factors beyond the value of the trade balance: stocks matter, as well as flows. In particular, we have focused on the importance of the valuation channel of exchange rate adjustment: currency fluctuations influence the rates of return on the inherited stocks of foreign assets and liabilities, in addition to operating through the traditional trade balance channel. In turn, this raises a set of substantive policy questions about the optimal external capital structure and the exploitability of the valuation channel as an adjustment mechanism.

An open question is how much further the financial globalization process will go: is the end point the idealized scenario of "perfect market integration," or will barriers such as trade costs and imperfect information place a limit on the extent of integration? The impact of financial globalization on exchange rate behavior and the international adjustment mechanism is likely to remain near the top of the research and policy agendas. We hope that much clearer answers can be given at the "100 Years After Bretton Woods" conference in 2044.

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Industrial countries sample: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States.

Emerging markets sample: Argentina, Brazil, Chile, Colombia, Mexico, Venezuela, China, India, Indonesia, Korea, Malaysia, Philippines, Taiwan province of China, Thailand, Czech Republic, Hungary, Poland, Russia, Israel, South Africa, Turkey.

Table 1. Net Capital Outflows and Changes in Net External Position
Industrial Countries, 1999–2003

	Net outflows		Change in net foreign assets	
	Billions US$	Pct. of 2003 GDP	Billions US$	Pct. of 2003 GDP
Japan	558	13.0	452	10.5
Switzerland	167	53.8	82	26.6
Norway	75	34.1	86	38.9
Canada	74	8.5	-43	-5.0
Euro Area*	40	0.5	-205	-2.5
Sweden	33	10.9	9	2.8
Denmark	24	11.4	9	4.2
New Zealand	-7	-9.7	-4	-4.9
Australia	-88	-17.3	-157	-30.8
United Kingdom	-139	-7.8	134	7.5
United States	-2246	-20.4	-1594	-14.5

* Change in the net foreign asset position calculated as the sum of the change in the net positions of Austria, Belgium, Finland, France, Germany, Greece, Italy, Netherlands, Portugal, and Spain.

Source: IMF, Balance of Payments Statistics, and Lane and Milesi-Ferretti (2004c).

Table 2. Gross Capital Flows to and from Industrial Countries (1999–2003)

	Capital Inflows		Capital Outflows		Change in Foreign Liabilities		Change in Foreign Assets	
	billions US$	percent of 2003 GDP	billions US$	percent of 2003 GDP	billions US$	percent of 2003 GDP	billions US$	percent of 2003 GDP
United States	4167	38	1922	17	3250	30	1656	15
Euro Area	3569	44	3609	44	...	...	...	...
United Kingdom	2387	133	2247	125	2660	148	2794	155
Switzerland	343	111	510	165	468	151	551	178
Canada	223	26	297	34	301	35	258	30
Australia	212	42	124	24	346	68	189	37
Sweden	190	63	223	74	191	63	199	66
Denmark	143	68	167	79	184	87	193	91
Norway	121	55	196	89	167	75	253	114
Japan	106	2.5	664	15	147	3	599	14
New Zealand	23	29	15	20	24	31	20	26

Source: IMF, Balance of Payments Statistics and Lane and Milesi-Ferretti (2004c).

Table 3. Cumulative Net Capital Flows to Selected Emerging Markets, 1999–2003

	Total		Excluding IMF and Exceptional Financing	
	billions US$	Percent of 2003 GDP	billions US$	Percent of 2003 GDP
		"Borrowers"		
Brazil	74.8	15.2	52.9	10.7
Mexico	70.3	11.2	78.2	12.5
Poland	37.9	18.1	37.9	18.1
Hungary	22.1	26.7	22.1	26.7
Czech Republic	16.7	18.7	16.7	18.7
Turkey	14.8	6.2	-6.4	-2.7
Argentina	14.1	11.1	-21.2	-16.7
		"Lenders"		
China	-131.5	9.3	-131.5	9.3
Russia	-117.4	27.1	-118.4	27.3
Taiwan Prov. of China	-62.5	21.8	-62.5	21.8
Korea	-56.7	9.4	-40.8	6.7
Thailand	-44.1	30.8	-44.8	31.3
Indonesia	-33.3	16.0	-33.5	16.1
Malaysia	-27.7	26.7	-27.7	26.7

Source: authors' calculations based on IMF, Balance of Payments Statistics.

Table 4. Indicators of International Financial Integration, Emerging Markets
(percent of GDP)

	1982	1992	2002
Average net external position	-32.6	-24.5	-26.2
Average external assets	15.8	24.9	55.5
of which:			
foreign exchange reserves	5.7	10.9	19.6
FDI + portfolio equity	1.3	3.0	12.1
Average external liabilities	48.4	49.4	81.7
of which:			
FDI + portfolio equity	7.4	11.1	32.9

Source: authors' calculations based on Lane and Milesi-Ferretti (2004c) and IMF, Balance of Payments Statistics

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Table 5. Gross Capital Flows to and from Selected Emerging Markets, 1999–2003

	Capital inflows				Capital outflows			
	Total		Excluding IMF and except. fin.		Total		FX reserves	
	billions US$	Percentage of 2003 GDP	billions US$	Percentage of 2003 GDP	billions US$	Percentage of 2003 GDP	billions US$	Percentage of 2003 GDP
China	259.1	18.3	259.1	18.3	390.6	27.7	258.6	18.3
Taiwan Prov. of China	69.9	24.4	69.9	24.4	132.4	46.3	72.1	25.2
Korea	65.7	10.9	81.7	13.5	122.5	20.2	91.9	15.2
Philippines	63.7	86.7	63.5	86.5	82.1	111.7	3.6	4.9
Brazil	110.4	22.4	88.4	18.0	35.6	7.2	2.1	0.4
Mexico	80.3	12.8	88.2	14.1	10.0	1.6	28.0	4.5
Poland	54.8	26.2	54.8	26.2	16.9	8.1	2.2	1.1
India	32.9	5.7	33.3	5.7	37.9	6.5	41.0	7.1
Chile	34.1	50.7	34.1	50.7	29.0	43.0	-1.2	-1.8
Indonesia	-21.6	-10.4	-21.8	-10.5	11.7	5.6	10.8	5.2
Thailand	-32.2	-22.5	-32.9	-23.0	11.9	8.3	8.6	6.0

Source: authors' calculations based on IMF, Balance of Payments Statistics and national sources.

Table 6. Decomposition of Change in Foreign Assets for Selected Emerging Markets, 1991–2002
(percent of GDP)

| | Change in net foreign assets | Cumulative current account | | Cumul. capital acct + errors & omissions | Other factors | | Perc. change in real eff. exchange rate |
| | | Cumulative trade balance | Cumulative investm. Income | | Growth effect | K-gains etc | |
	$b_{2002} - b_{1990}$	$\sum_{1991}^{2002} bgst$	$\sum_{1991}^{2002} \dfrac{i_t^A A_{t-1} - i_t^L L_{t-1}}{Y_t^\$}$	$\sum_{1991}^{2002} (ka_t + eo_t)$	$\sum_{1991}^{2002} -\dfrac{g_t}{1+g_t} b_{t-1}$	$\sum_{1991}^{2002} \dfrac{KG_t}{Y_t^\$} - \left[\dfrac{\pi_t - d_t}{(1+g_t)(1+\pi_t)}\right] b_{t-1}$	
Brazil	-30.6	2.8	-30.6	-0.6	10.9	-13.1	-47.9
Czech Republic	-29.4	-23.5	-16.2	-0.2	-0.1	10.5	35.8
Indonesia	-6.1	59.3	-53.3	0.8	26.1	-39.0	-16.1
Mexico	-8.8	-6.2	-36.3	-2.9	17.7	19.0	32.5
Thailand	-10.0	31.0	-31.8	-6.7	19.4	-21.9	-18.2
Turkey	-21.3	14.2	-23.1	-0.1	11.6	-23.9	-2.9

Note: the breakdown of changes in the net foreign asset position reflects equation (5) in the text.

Source: IMF, International Financial Statistics, and Lane and Milesi-Ferretti (2004c).

Table 7. US: Relative Contributions of Flows, Market Values and Exchange Rates to
Dynamics of the International Balance Sheet, 1990–2003

	Mean			Standard Deviation
	1990–95	1996–2001	2002–03	1990–2003
CON__FLOW _FA	0.056	0.081	0.034	0.030
CON__FLOW _FL	0.081	0.108	0.082	0.029
CON_MV _FA	0.031	0.038	-0.016	0.088
CON_MV _FL	0.022	0.034	-0.021	0.066
CON_ER _FA	0.008	-0.017	0.055	0.030
CON_ER _FL	0.000	-0.003	0.005	0.004

Source: US Bureau of Economic Analysis (BEA). We thank Cedric Tille for kindly sharing
in electronic form his history of the BEA data releases.

Table 8. Australia: Relative Contributions of Flows, Market Values and Exchange Rates to
Dynamics of the International Balance Sheet, 1988.3–2004.2

	Mean				Standard deviation
	1988.Q3-1993.Q3	1993.Q4-1997.Q1	1997.Q2-2001.Q1	2001.Q2-2004.Q2	1988.Q3–2004.Q2
CON__FLOW _FA	0.090	0.078	0.081	0.090	0.072
CON__FLOW _FL	0.017	0.040	0.061	0.016	0.036
CON_MV _FA	0.017	0.040	0.061	0.016	0.128
CON_MV _FL	0.014	0.005	0.024	0.007	0.052
CON_ER _FA	0.020	-0.023	0.083	-0.022	0.11
CON_ER _FL	0.014	-0.013	0.031	-0.012	0.047

Source: Authors' calculations based on data from the Australian Bureau of Statistics.

Table 9. Exchange Rates and Rates of Return on Foreign Assets

	(1) Total	(2) FDI	(3) Port_Eq	(4) Port_Debt	(5) Other
USA	-0.37***	-0.57***	-1.24	-0.65***	-0.11
UK	-1.01***	-0.83***	-0.74	-1.01***	-0.96***
Austria	-1.34**	-3.85**			
France		-0.36			
Germany	-0.88***	-1.04***	-2.49***	-1.16***	-0.45***
Italy	-1.08***	-1.17***			
Netherlands	-0.38	-0.33	-0.61	-0.37	-0.42
Sweden	-0.74*	-0.63**			
Switzerland	-1.07***	-0.62**	-2.43***	-0.8**	-0.93***
Canada	-0.66***	-0.46*		-0.97***	-0.86***
Finland	-1.09***	-1.07**			
Iceland	-0.85	-0.5			
Spain	-0.69***	-1.62***	-0.55	-1.62***	-0.61**
Australia	-0.57***	-0.65**	-0.55*	-0.89***	-0.41*
Panel	-0.78***	-0.76***	-0.97***	-0.89***	-0.63***

Note: Beta coefficients from regression of rate of return on real appreciation. ***,**,* denote significance at the 1,5 and 10 percent levels respectively. OLS with robust standard errors. Panel estimation includes country fixed effects (not reported). Full regression results available from the authors upon request. Data availability varies by country, within 1980–2003 span.
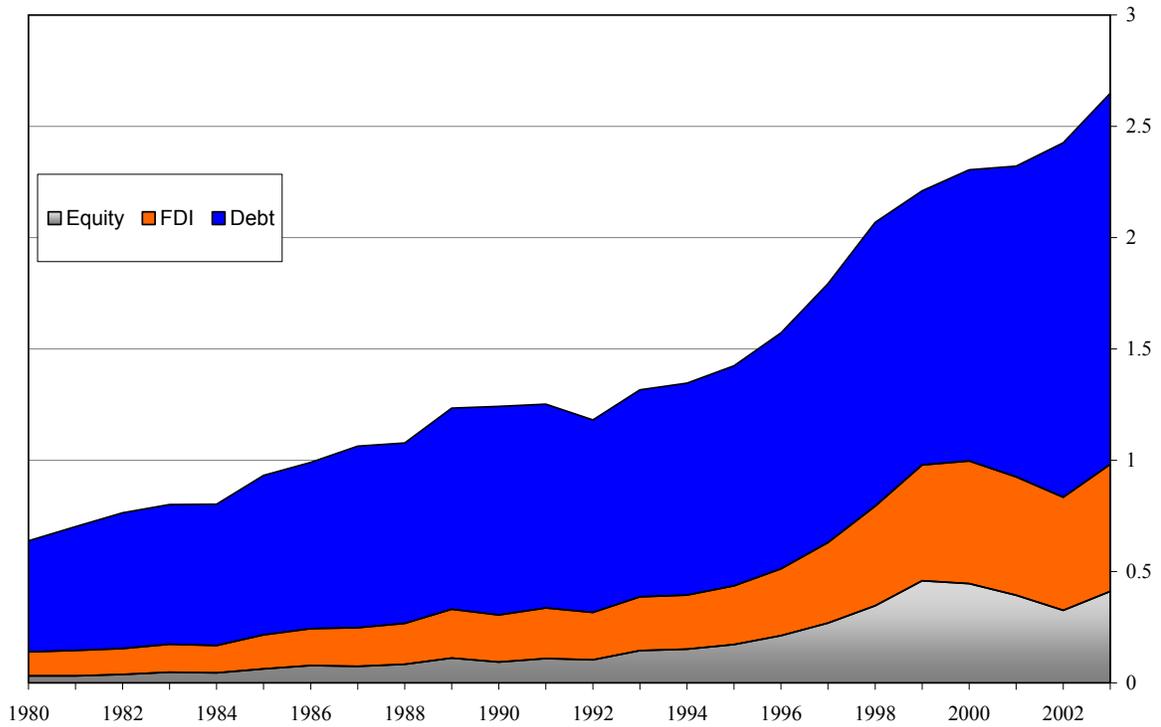
Source: authors' calculations based on IMF, Balance of Payments Statistics, and Lane and Milesi-Ferretti (2004c).

Table 10. Exchange Rates and Rates of Return on Foreign Liabilities

	(1) Total	(2) FDI	(3) Port_Eq	(4) Port_Debt	(5) Other
USA	0.014	0.08	0.36	-0.26	0.05
UK	-0.92***	-0.1	-0.52	-0.46*	-0.78***
Austria	-0.95	-0.35			
France		0.85			
Germany	-0.49**	-1.04	-2.9**	-0.45	-0.15
Italy	-0.71***	-0.14			
Netherlands	-0.12	-0.33*	-0.48	-0.03	-0.20
Sweden	-0.77***	-0.21			
Switzerland	-0.73***	-0.14	-0.57	-0.77	-0.84***
Canada	-0.52***	0.06		-0.81***	-0.67***
Finland	-1.79*	0.91			
Iceland	-1.33***	-1.43			
Spain	-0.69***	0.15	-1.28	-0.9	-1.52**
Australia	-0.31***	0.02	-0.44	-0.64***	-1.68***
Panel	-0.68***	-0.09	-0.56*	-0.60**	-0.79***

Note: Beta coefficients from regression of rate of return on real appreciation. ***,**,* denote significance at the 1, 5 and 10 percent levels respectively. OLS with robust standard errors. Panel estimation includes country fixed effects (not reported). Full regression results available from the authors upon request. Data availability varies by country, within 1980–2003 span.
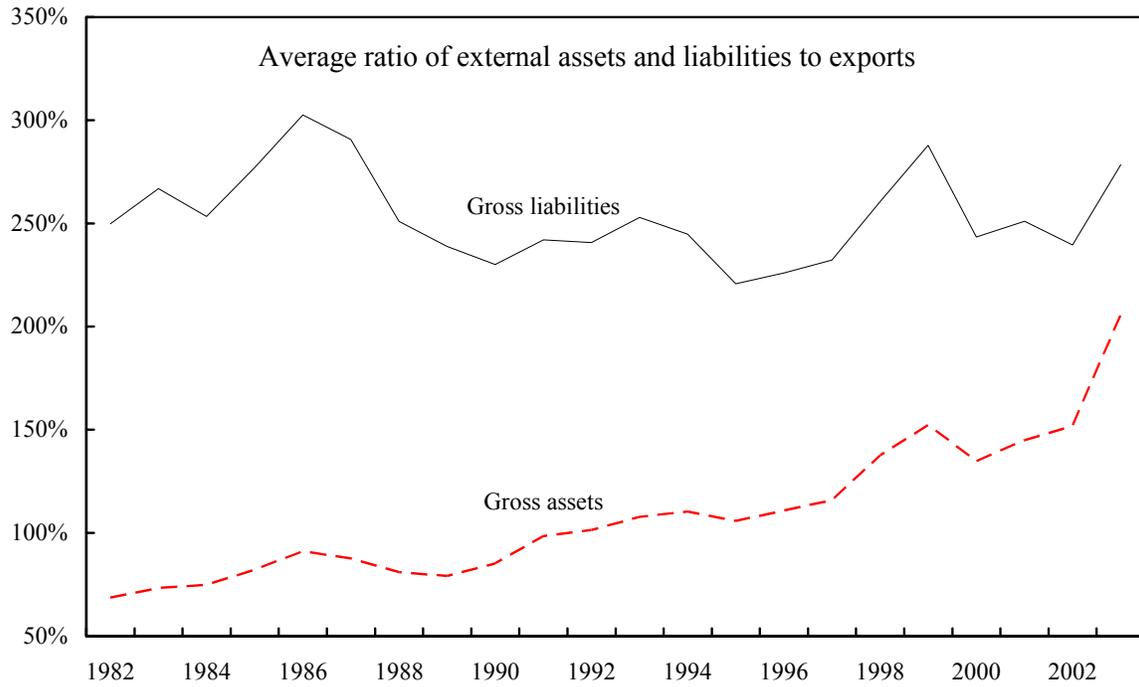
Source: authors' calculations based on IMF, Balance of Payments Statistics, and Lane and Milesi-Ferretti (2004c).

Figure 1. Net Foreign Asset Position (ratio of GDP) and GDP per capita
Industrial Countries, 2003
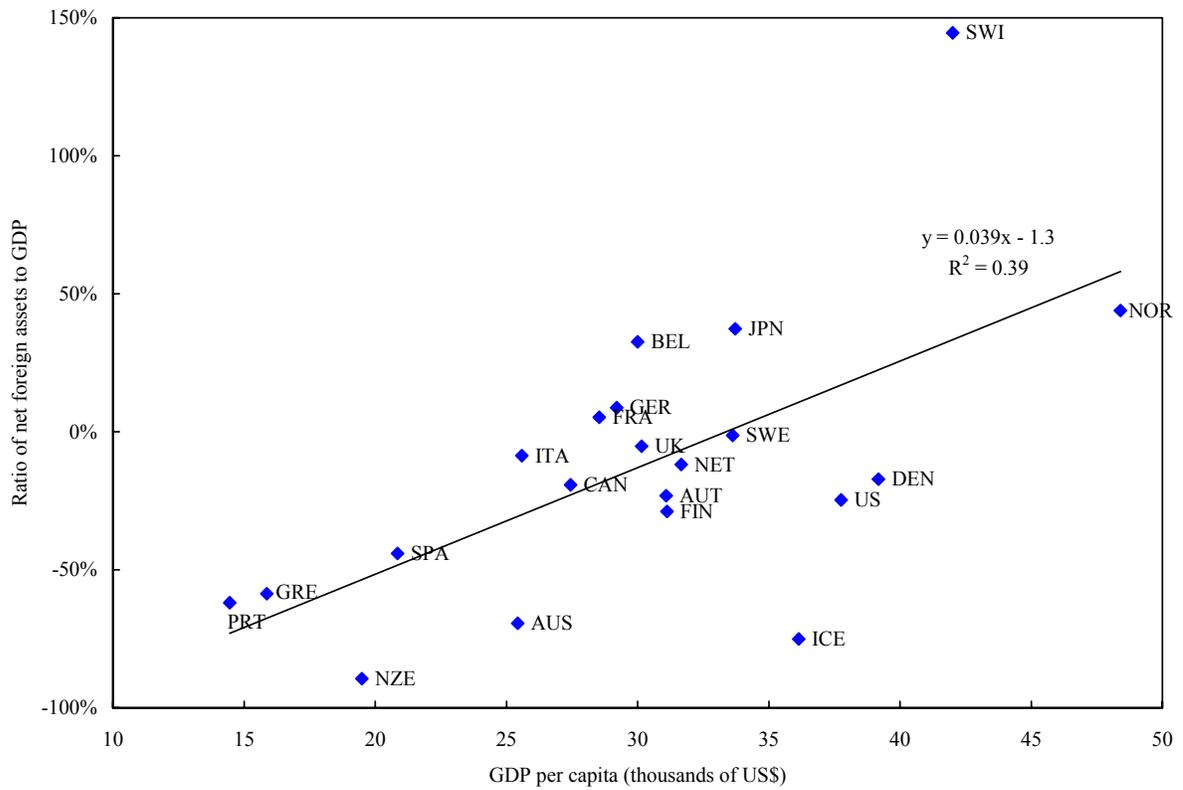
Sources: IMF, World Economic Outlook (GDP per capita) and Lane and Milesi-Ferretti (2004c) (net foreign assets).

Figure 2. Composition of International Portfolio, Industrial Countries
(Sum of Assets and Liabilities as a Ratio of GDP, 1980–2003)

Note: Chart plots the sum of aggregate equity, FDI, and debt assets and liabilities as a share of aggregate GDP for a sample of industrial countries including: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Iceland, Italy, Japan, Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom, United States. The sample choice is dictated by data availability.

Source: Lane and Milesi-Ferretti (2004c).

Figure 3. Average and Aggregate Current Account to GDP Ratio
Emerging Markets Sample, 1970–2003
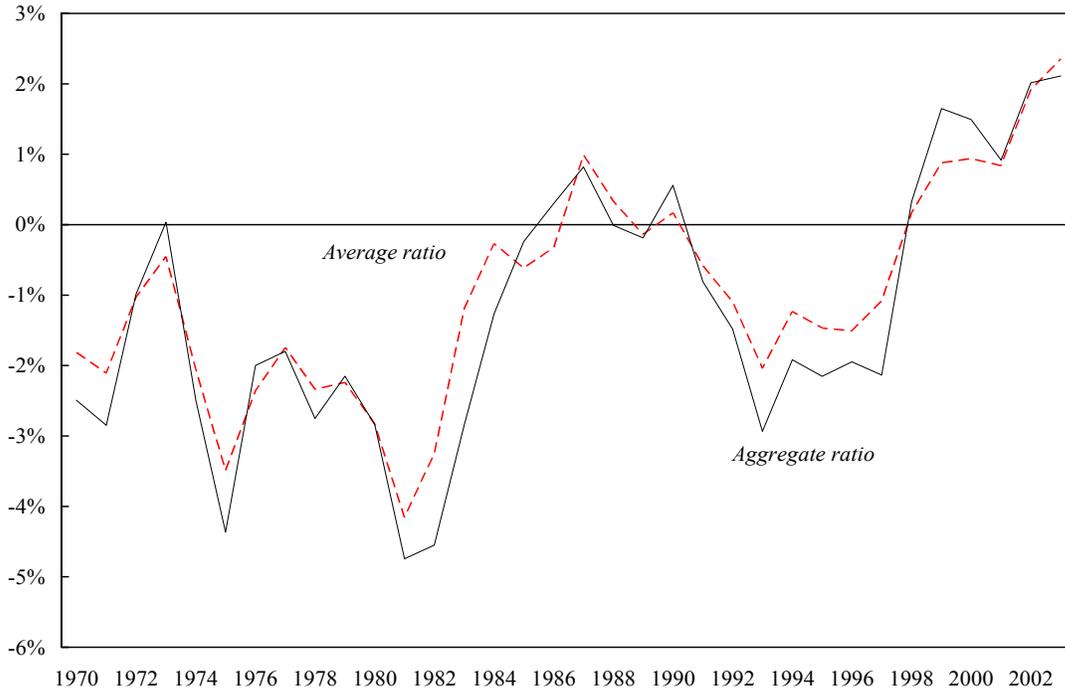
Figure 4. Average and Aggregate Net External Position, Emerging Market Sample,
1982–2003*
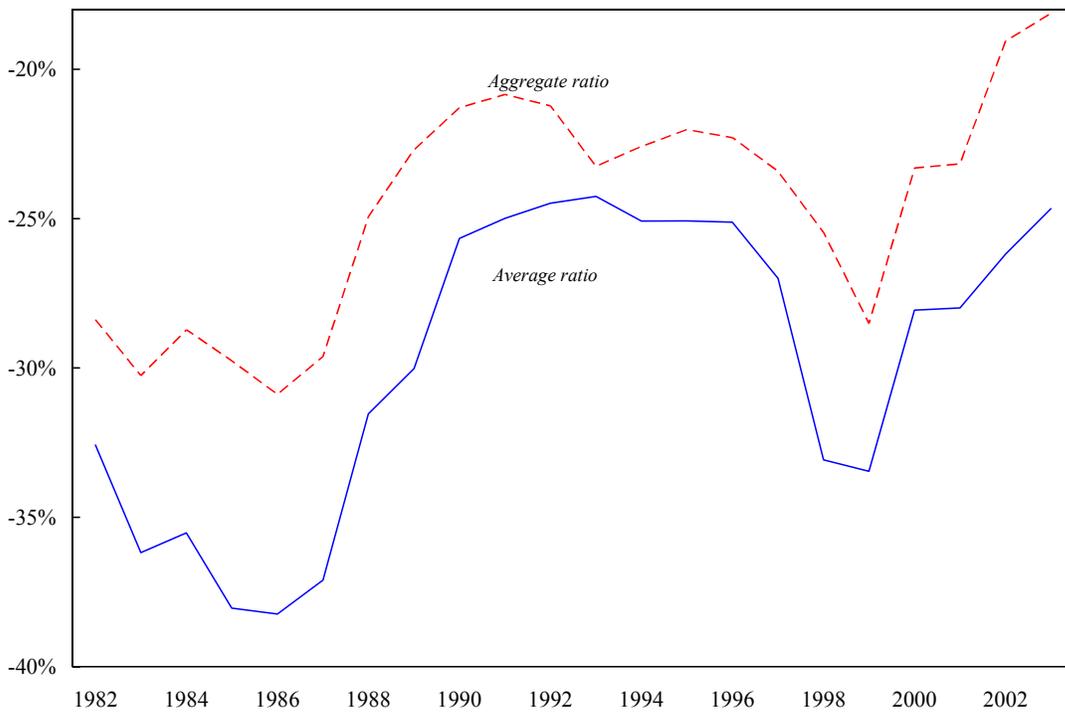
Source: authors' calculations based on IMF, Balance of Payments Statistics and Lane and
Milesi-Ferretti (2004c).

Figure 5. Net Foreign Assets and GDP per capita
Emerging Markets Sample, 2002
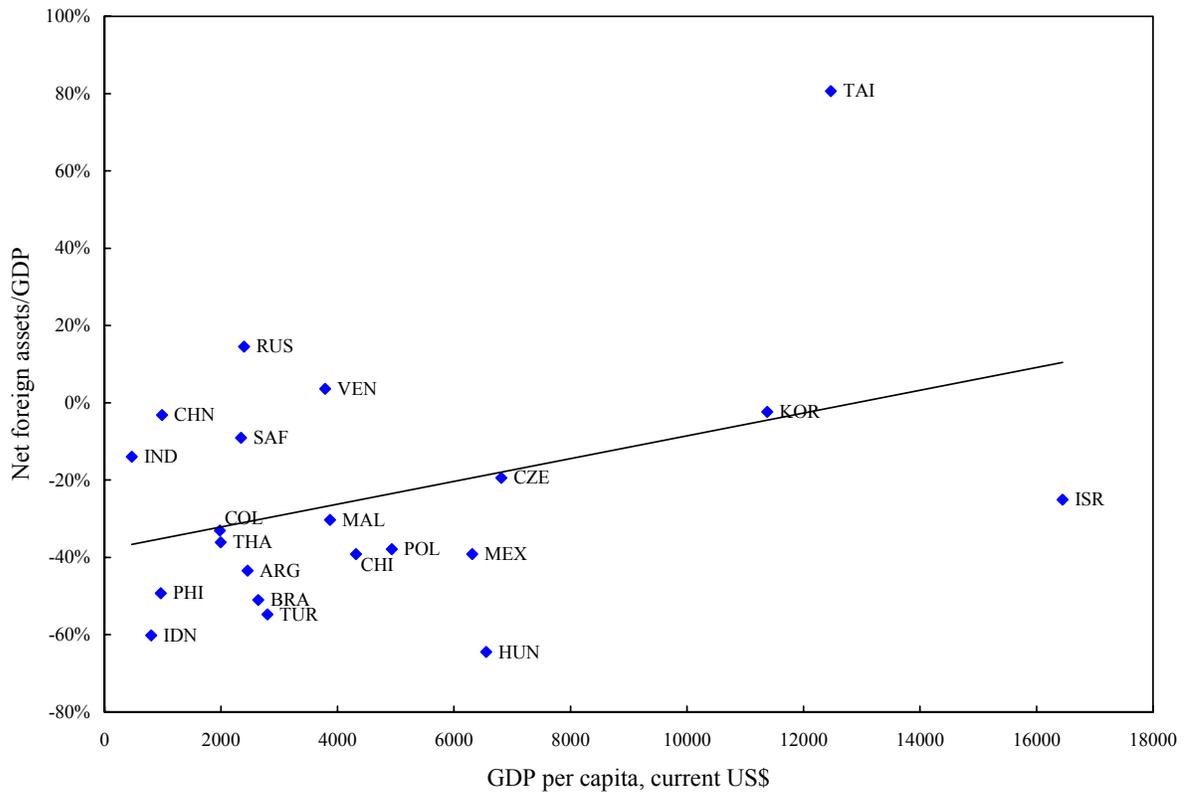
Sources: IMF, World Economic Outlook (GDP per capita), and Lane and Milesi-Ferretti
(2004c) (net foreign assets).

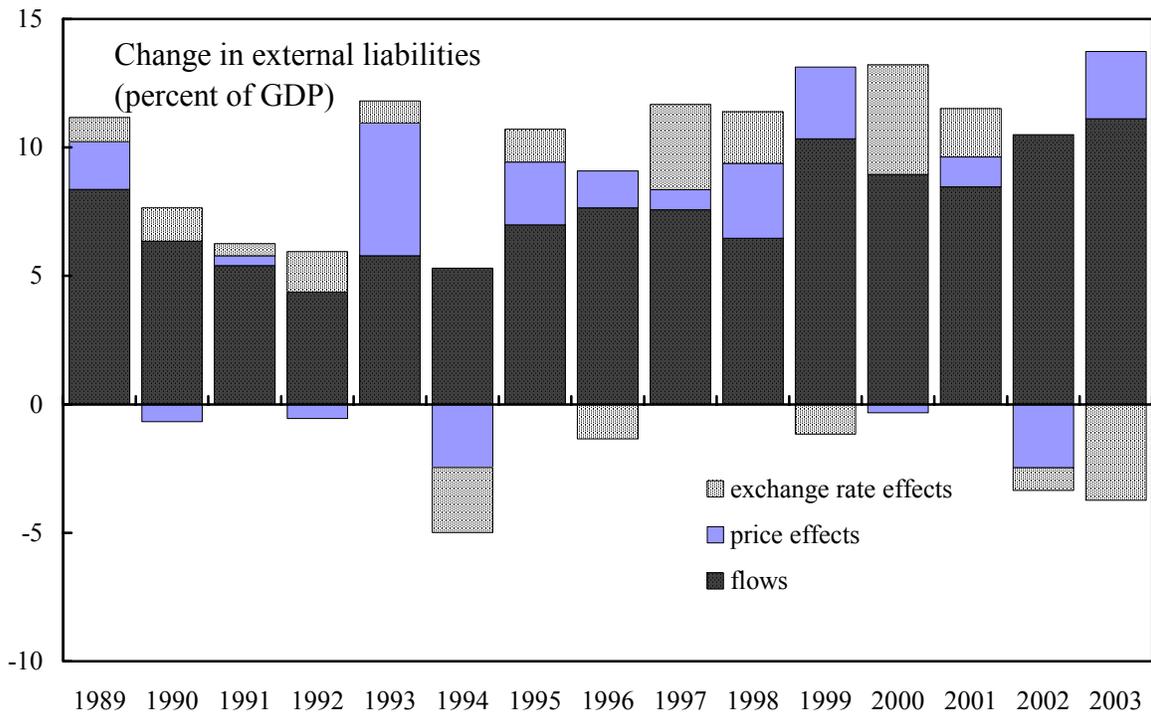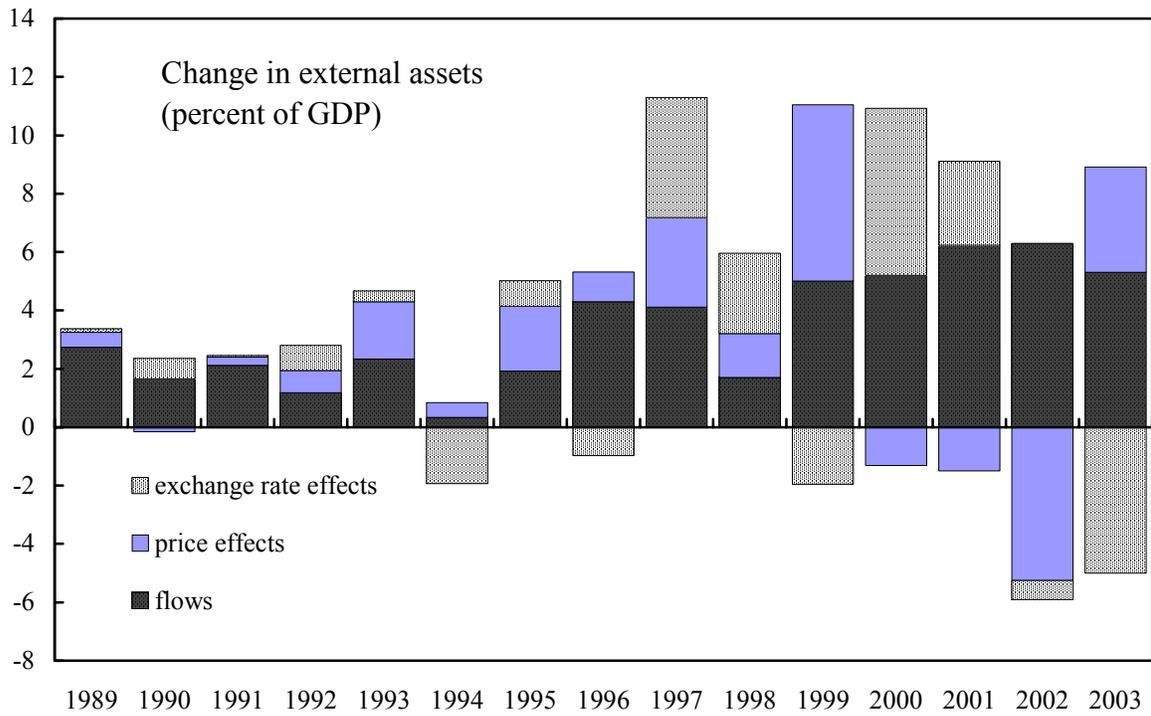Figure 6. Indicators of International Financial Integration, Emerging Markets
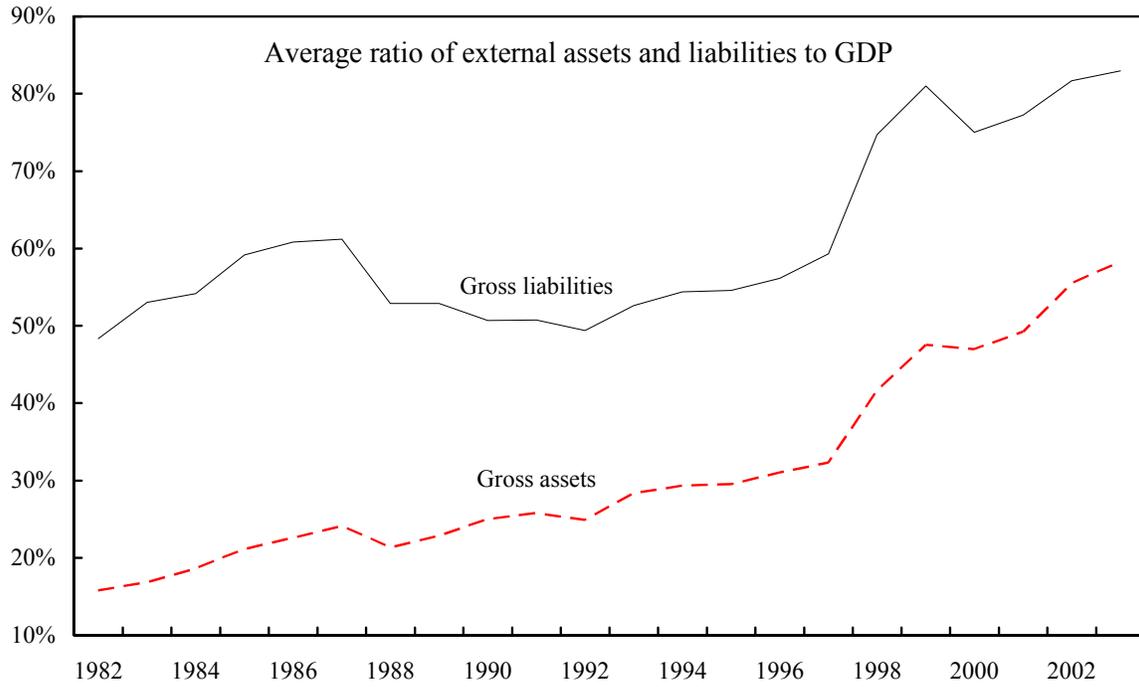
Source: Authors' calculations based on Lane and Milesi-Ferretti (2004c).

Figure 7. United States: Components of Change in External Assets and Liabilities, 1990–2003
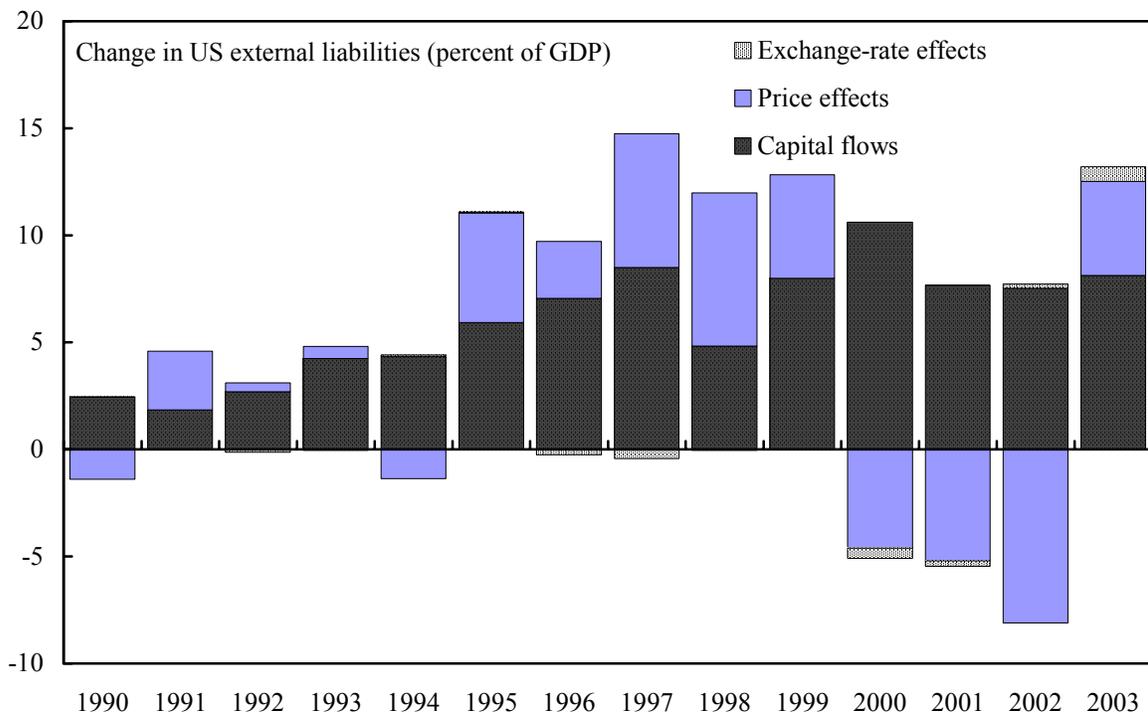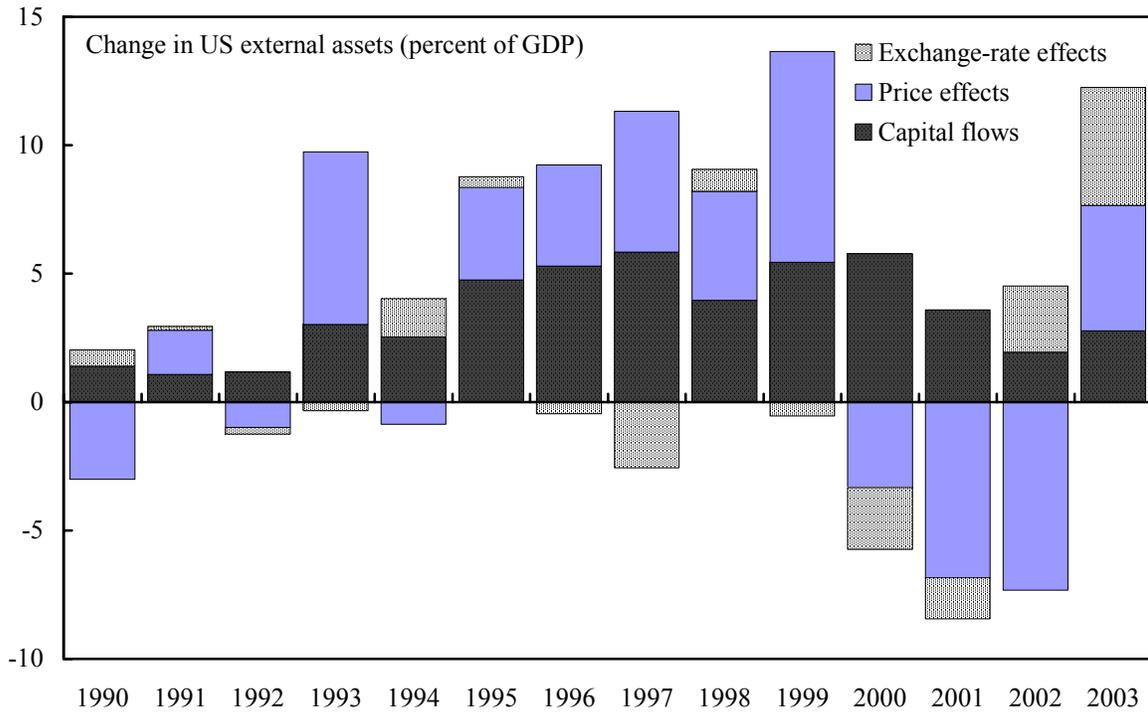

Source: Authors' calculations based on Tille (2003) and updated data provided by Cédric Tille.

Figure 8. Australia: Components of Change in External Assets and Liabilities, 1989–2003

Change in external assets
(percent of GDP)

▨ exchange rate effects

▥ price effects

▧ flows

Change in external liabilities
(percent of GDP)

▨ exchange rate effects

▥ price effects

▧ flows

Source: authors' calculations based on Australian National Statistics

Figure 9. Real Rate of Return on External Liabilities and Changes in Real Exchange Rate
Emerging Market Sample, 1997
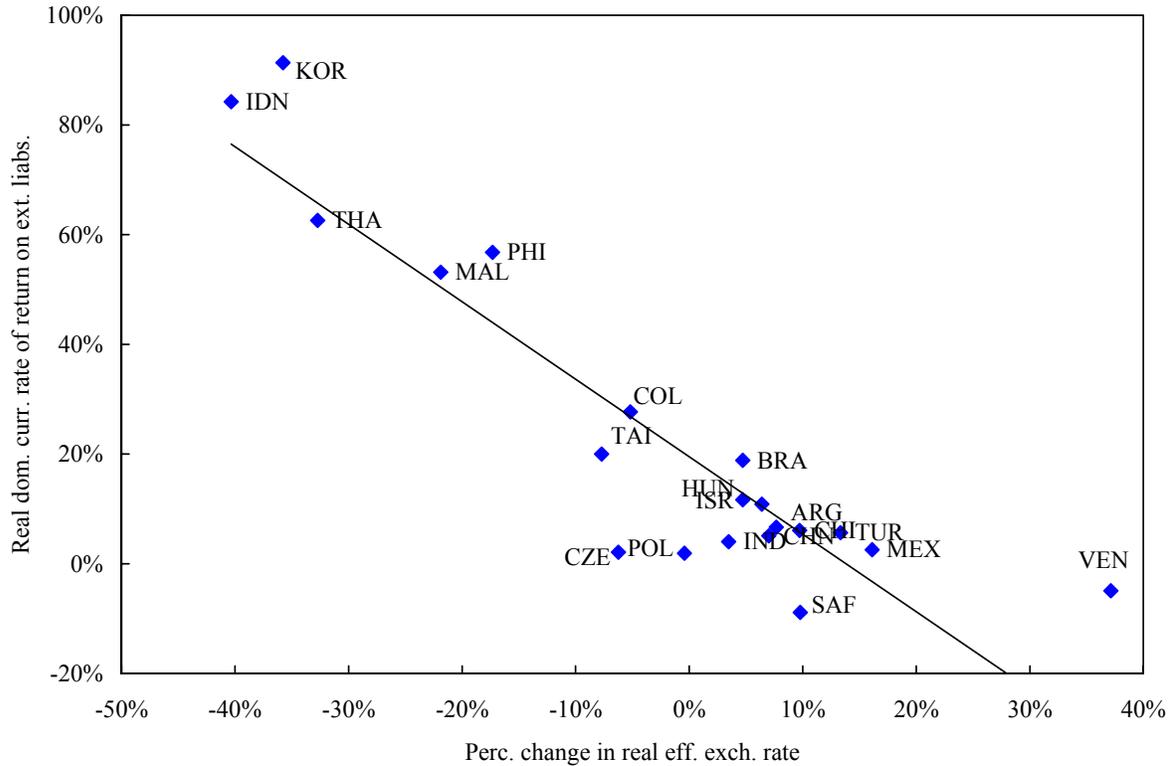
Note: the real domestic currency rate of return on external liabilities is constructed as the sum of the yield (interest payments in 1997 divided by the stock of liabilities at end-1996) and the capital gain rate (change in stock of external liabilities between 1997 and 1996 minus flow, divided by stock of external liabilities at end-1996). The change in the real exchange rate is the percentage change in the CPI-based real effective exchange rate between end-1997 and end-1996.

Source: authors' calculations based on IMF, Balance of Payments Statistics, International Financial Statistics, and Lane and Milesi-Ferretti (2004c).