Preliminary
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Financial globalization and exchange rates

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Abstract

The founders of the Bretton Woods System sixty 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 means 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 inter-connections between financial globalization and exchange rate adjustment.

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I. INTRODUCTION

Financial globalization has been one of the most important trends in the world economy in recent decades. This process has involved the accumulation of large gross international investment positions, with foreign asset and liability positions sharply rising, whether scaled by GDP or by domestic financial variables (Lane and Milesi-Ferretti 2003a, 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 to take 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 revaluations of existing investment positions. For instance, the value of the net liability position of the US is quite sensitive by the relative movements in the US versus non-US equity markets and by swings in the value of the dollar. Indeed, such revaluation 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, 2004).

Our goal in this paper is to 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 developing economies. This extends our previous work: in particular, we update our estimates of external assets and liabilities for a sample of emerging markets.[1] Given the evidence on the increased pace of financial globalization since the mid-1990s documented for industrial countries in Lane and Milesi-Ferretti (2003a), it is timely to provide an overview extended to emerging markets that encompasses the most recent period. As noted above, a central aspect of our analysis is the focus on the factors

[1]Lane and Milesi-Ferretti (2001a) explain the construction of the data.

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.

In the second part of the paper we first provide an analytical framework that is useful in understanding the factors driving the dynamics of the net foreign asset position, 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 nature of the co-movement between exchange rate changes and other financial returns.[2] These factors will vary across countries, according to the level of development, country size and other characteristics. Along one dimension, it is well appreciated that 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 instruments 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 external capital structure.[3]

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. In the last part of the paper, we also sketch the implications of our empirical work for policy analysis.

II. TRENDS IN INTERNATIONAL FINANCIAL INTEGRATION

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

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[2]Tille (2003) provides an interesting analysis for the US.

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

A. Net flows and net positions, industrial countries

Figure 1 plots the net foreign asset position as a ratio of GDP against the level of GDP per capita, measured in current US dollars, for the year 2002. There is a wide dispersion in net foreign asset positions among industrial countries, with Switzerland being by far the largest creditor, and New Zealand and Iceland the largest debtors. The positive relation between net foreign assets and GDP per capita, which is shown in the Figure to hold in the cross-section, holds also along the time-series dimension—as countries get richer, relative to trading partners—their net foreign asset position tends to improve (Lane and Milesi-Ferretti, 2002a).

Table 1 summarizes net capital outflows from industrial countries over the period 1999-2002, 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 8.5 percent of GDP; Sweden instead was a net capital exporter, but its net position deteriorated substantially.[4]

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, assets and liabilities to GDP increased four-fold, portfolio equity assets and liabilities six-fold, and debt assets and liabilities to GDP 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.[5]

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[4] The main reason for Sweden's deterioration in net foreign assets is the decline in value for the large holdings of Swedish direct investment abroad, when measured at market value. If Sweden's FDI is measured at book value, its net external position improved between 1998 and 2002.

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

Table 2 summarizes gross capital flows to and from industrial countries during the period 1999-2002. 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. While there are substantial net flows, the data suggest that portfolio diversification, rather than intertemporal borrowing and lending, is the dominant motive for international asset transactions among industrial countries.

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 emerging markets' 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.

The dynamics of the net external position, expressed as a ratio of GDP, is 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 until the Asian crisis, the deterioration caused by the sharp declines in GDP and real exchange depreciation, 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 US 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.[6]

We turn now to the evolution of capital flows to individual countries during the most recent period. 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 1999-2002. The table shows a number of Latin American and Central European countries as the largest net

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

recipients of net capital flows, while Asian countries, together with Russia, have been on average net capital exporters.

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 of GDP during the past 20 years. However, there is virtually no increase in average external liabilities when they are 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 a large degree of 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 acount for the same share of total external assets as in 1982 (about one third). Direct investment and portfolio equity assets have also increased during the past two decades, and represented around 10 percent of GDP and 1/6 of total external assets.

Table 5 characterizes gross capital flows to and from some emerging economies during the period 1999-2002. 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, and Thailand, together with oil-exporting countries such as Russia. For another group of countries, instead, gross inflows and gross outflows have been large and similar in magnitude, reflecting increased financial integration with the world economy. Examples include Chile and China. [7]

[7] 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 asset positions 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 potentially affect the external adjustment process. We then provide a decomposition of 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 the net foreign asset position *B* can be written as follows:

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

where *B* is the net foreign asset position, *CA* is the current account balance, *KA* is the capital account balance, *EO* are errors and omissions, and *KG* is the net capital gain (change in stock minus underlying flow). In line with statistical reporting practices, all variables are expressed in US dollars. Equation (1) can also be expressed as follows:

$$B_t - B_{t-1} = BGST_t + (KA_t + EO_t) + (i_t^A A_{t-1} - i_t^L L_{t-1} + KG_t) \tag{2}$$

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 yields on these assets and liabilities.

Taking ratios of GDP and indicating such ratios with lower-case letters, we can express (2) as follows:

$$b_t - b_{t-1} = bgst_t + (ka_t + eo_t) + \frac{i_t^A A_{t-1} - i_t^L L_{t-1} + KG_t}{Y_t^{\$}} - \frac{\gamma_t}{1+\gamma_t} b_{t-1} \tag{3}$$

where γ_t is the growth rate of nominal GDP measured in US dollars and *bgst* indicates the ratio to GDP of the sum of trade balance, errors and omissions, and capital account. Another way to re-write the above expression is as follows:

$$b_t - b_{t-1} = bgst_t + \frac{i_t^A A_{t-1} - i_t^L L_{t-1} + KG_t}{Y_t^{\$}} + (ka_t + eo_t) - \left[\frac{\pi_t - d_t}{(1+g_t)(1+\pi_t)}\right] b_{t-1} - \frac{g_t}{1+g_t} b_{t-1} \tag{4}$$

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 US dollar. In other words, changes in the net external position can be due to several factors:

1. the current account;
2. the capital account and net errors and omissions;
3. net capital gains (measured in US dollars);
4. the effect of exchange rate changes on the past net foreign asset position; [8]
5. the effect of real GDP growth on the past net foreign asset position.

An alternative way to express equation (4) 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 US dollars, so that $k_t^A FA_{t-1} - k_t^L FL_{t-1} = KG_t$, 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 US dollars, with an analogous definition holding for the rate of return on foreign liabilities $\hat{r}_t^L$. In this case we can re-write (4) as follows:

$$b_t - b_{t-1} = bgst_t + (ka_t + eo_t) + \frac{\hat{r}_t^L - g_t - \varepsilon_t(1+g_t)}{(1+g_t)(1+\varepsilon_t)} b_{t-1} + \frac{\hat{r}_t^A - \hat{r}_t^L}{(1+g_t)(1+\varepsilon_t)} a_{t-1} \qquad (5)$$

Equation (5) shows several factors that can account for the dynamics of net foreign assets: the adjusted trade balance, the difference between the real interest rate and the growth rate, adjusted for the bilateral real exchange rate vis-à-vis the US dollar, and differences in returns between foreign assets and liabilities.

If we express the real rates of return in domestic currency and denote them by r_t^A, r_t^L, equation (5) takes the more familiar form:

$$b_t - b_{t-1} = bgst_t + (ka_t + eo_t) + \frac{r_t^L - g_t}{1+g_t} b_{t-1} + \frac{r_t^A - r_t^L}{1+g_t} a_{t-1} \qquad (6)$$

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[8] 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 will be given by $\frac{KG_t}{Y_t^{\$}} = -\frac{d_t}{(1+\pi_t)(1+g_t)} b_{t-1}$, which is similar (with an opposite sign) to the term $-\frac{\pi_t - d_t}{(1+g_t)(1+\pi_t)} b_{t-1}$ in equation (4).

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 (5), 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 (5) , 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 preliminary 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 the net foreign asset position are given by the sum of the current account (itself divided into trade balance ands 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:

a. 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.

b. On the other side, Hungary'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 the forint and the peso between end-1990 and end-2002.

In summary, the Tables highlights 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 the net external position.

IV. Exchange Rates and the Adjustment process

The framework summarized in equation (5) 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 the accumulated holdings of foreign assets and liabilities).

A. Exchange Rates, the Trade Balance and Real Output

The inter-connection 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, 2004) 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 wide 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 integration of product markets) 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 US 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 US 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 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.[9] 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 the net foreign asset position depends not only on the evolution of the trade balance but also on the rates of return earned on accumulated foreign assets and paid out on accumulated foreign liabilities. In domestic-currency real terms, the net impact is given by

$$RET_t = r_t^A A_{t-1} - r_t^L L_{t-1} \tag{7}$$

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

$$\frac{\partial RET_t}{\partial RER_t} = \frac{\partial r_t^A}{\partial RER_t} A_{t-1} - \frac{\partial r_t^L}{\partial RER_t} L_{t-1} \tag{8}$$

It is clear from this expression that an exchange rate movement 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.[10] 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 position 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).

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[9] 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.

[10] 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.

Of course, even if the exchange rate does indeed have a valuation impact, it does not mean that the net foreign asset position will be changed one-for-one. First, movements in the exchange rate also have a direct impact on the trade balance. Second, a valuation gain 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). 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.

In addition, equation (8) only captures the contemporaneous impact of a change in the exchange rate. Some return series may respond to the exchange rate only with a lag (for instance, the profitability of FDI positions may by dynamically 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.

More generally, the net impact of exchange rate movements for the value of holdings that carry a variable market return depends on the nature of the comovements 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.

In view of the range of possible theoretical scenarios, the strength of the valuation channel is

ultimately an empirical issue. Accordingly, we turn to quantitative exploration in the next section.

C. 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. In addition to the aggregate positions, we also examine the rates of return 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

$$r_{it}^{A} = \alpha + \beta dlrer_{it} + u_{it} \tag{9}$$

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.[11] We run an analogous equation for the rate of return on foreign liabilities.) 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.

Moreover, for the time being, we just run least squares regressions, rather than trying to control for any endogenous response of the exchange rate to shifts in the rate of return. (Indeed, we will allow for the possibility of such reverse causation when discussing the results.) Rather, our primary interest is just in establishing the direction and magnitude of the co-movement between the exchange rate and rates of return. Finally, 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.[12]

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[11] 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 the stock of foreign assets at the end of year $t-1$.

[12] In the discussion of the results, we do return to the issue of the predictability of exchange rate movements.

We begin by examining the rates of return on foreign assets in Table 7.[13] 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, with the fixed-effects panel point estimate being -0.78. For a number of countries, the estimated coefficient is in fact very close to -1 (UK, Germany, Italy, Switzerland and Finland). For these countries, 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.

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

In some cases, we observe a coefficient above unity, which means that real appreciation is associated with a fall in the foreign-currency rate of return 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-movements with foreign-currency returns and the domestic real exchange rate.

[13] 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.

The results for FDI assets are given in column (2).[14] 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 real appreciation on the real return on FDI foreign assets is -0.76: since the pass through is less than proportional, real appreciation episodes on average coincide with periods of improved foreign-currency real returns. 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 real returns on FDI assets.

We next turn to the returns on portfolio equity assets in column (3). The fixed-effects panel estimate is very close to -1, which indicates a profile in which the contributions of exchange rate movements and foreign-currency rates of return to the domestic-currency real rate of return are orthogonal. Two exceptions to this rule are provided by Germany and Switzerland that display significant coefficients of (-2.49,-2.43) respectively: 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. The explanatory power of the exchange rate in explaining domestic-currency returns is typically quite good and the fixed-effects panel coefficient estimate of -0.89 is fairly representative. This pattern is consistent with the foreign-currency returns on foreign portfolio debt assets exogenously determined with respect to the domestic real exchange rate. However, there are exceptions: for instance, the United States 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. An important exception is the US, where the coefficient estimate is an insignificant -0.11: again, a good candidate explanation is that a high proportion of its foreign lending is in US dollars.

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[14] In the sample represented in this table, only the Netherlands and Australia record FDI at market value. The US reports positions measured at both book and market value. For comparability with the countries that only report book values, the US estimates in these tables refer only to the book value measure of FDI. However, for the US, 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.

We turn to the rates of return on foreign liabilities in Table 8. 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. 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 (albeit significant only at the 10 percent level): a 10 percent real appreciation is associated with a 18 percentage point decrease in the real return paid out on foreign liabilities, as measured in domestic real terms. Although a pattern of high real returns plus exchange rate depreciation is also evident during the early 1990s, the most striking period for Finland is the post-EMU 1999-2002 period: 1999 saw a very large rate of return paid out on its foreign liabilities (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 (with the recovery in the external value of the euro). This case is a vivid illustration of the importance of understanding the nature of co-movements between exchange rates and asset prices. Moreover, it also underlines the fact that 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.

For the other countries in the sample, the estimated coefficients generally are in the (-1,0) range, with the fixed-effects panel estimate at -0.68. In a more attenuated form than in the Finnish case, this generally indicates that exchange rate appreciation is associated with some deterioration in domestic real returns on foreign liabilities. For a couple of countries, the coefficient is quite close to unity: in approximate terms, it seems for these countries that foreign liabilities can be viewed as offering a target return in foreign currency, with exchange rate movements just proportionately shifting the domestic currency counterpart.

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 paid out on foreign liabilities. For instance, a positive domestic productivity shock might be expected to raise the profitability of foreign affiliates operating in the domestic market and generally boost domestic asset prices, while at the same time generating real appreciation.

With respect to FDI liabilities, column (2) of Table 8 suggests that, with the marginal exception of the Netherlands, exchange rate fluctuations appear to exert no influence on the 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. Indeed, there is only one significant country coefficient (Germany), but it is negative and large (-2.9). 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, the correct interpretation in fact is 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.

On the liability side, 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. Even for Canada and Australia, the pattern of co movement 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 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.

On the liability side, a number of countries display 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 raises the real return paid to foreign investors more than proportionately, with the foreign-currency return on net increasing.

In summary, the regression analysis in Tables 7-8 delivers a number of interesting lessons. First, especially on the foreign assets side, exchange rate movements are an important determinant of rates of return: the valuation channel is powerful. 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 quite differently to 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 US 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.

D. 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 (making use of flow data with valuation adjustments, as in Lane and Milesi-Ferretti, 2001), 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 with a t-statistic of 19.[15] As Figure 7 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.

E. Case Studies: the US and Australia

It is possible to gain extra insight into the quantitative importance of the valuation impact of exchange rate countries for those countries that report 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 to for two countries in our sample (the US 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 8 and 9 present the decompositions for the US and Australia respectively. The tables show the average annual relative contributions of each component in proportion to the inherited stocks of foreign assets (liabilities):

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

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

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

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

In addition, the tables display the standard deviations for these components.

For both the United States and Australia, the ranking of the three components in terms of their relative importance is clear for both asset and liability dynamics: capital flows are the primary driving factor, followed by the contribution of market value gains, with the capital gains offered by exchange rate movements least important.

For the United States, the average contribution of the exchange rate channel is close to zero over 1990-2001. However, on the foreign asset side, it grew in importance during 1996-2001 relative to 1990-1995. During the more recent sub-period, the dollar was in an appreciation phase, such that the exchange rate acted to reduce the value of accumulated foreign assets. Of course, 2002-2003 should record a marked positive contribution of the exchange rate channel to the value of US foreign assets, in line with the recent dollar depreciation. In accordance with our earlier results, the impact of the exchange rate valuation channel on US foreign liabilities remains close to zero throughout. Another noteworthy feature of the US data is that market-value capital gains are a substantial factor, reaching nearly 50 percent of the contribution of capital flows to foreign asset accumulation. Market value gains are also important on the liability side, albeit a smaller fraction of the capital flow contribution.[16] In terms of the relative stability of the various components, capital flows have been much less volatile than either of the capital gain terms. In particular, the standard deviation has been more than twice as large as the (absolute) value of the average for the market-value capital gain term.

Turning now to the Australian evidence, Table 9 shows that the exchange rate valuation component has been much more important than in the US case. Especially during the 1994.4-2001.2 period, the exchange rate term has been nearly important as the market value term in driving accumulation dynamics: moreover, on the assets side, the combined capital gain has exceeded the contribution of capital outflows. During this period: the exchange rate has acted asymmetrically, with the capital gain on foreign assets much larger than on foreign liabilities.

[16] The difference in the ratio of market value gains to capital flows between the asset and liability sides is the counterpart to the large excess of capital inflows over capital outflows, which has accelerated since the mid-1990s.

This reflects the substantial real depreciation of the Australian dollar during this period. In relation to this period, many commentators have commented on the success of Australia in avoiding the worst impact of the 1997-1998 Asian crisis: the data show that the depreciation strategy operated not just through its impact on the trade balance and capital flows but also through a favorable valuation effect. Finally, we note that the exchange rate component for Australia has been much more volatile than for the US.

These case studies have provided suggestive evidence about the importance of the valuation channel in driving fluctuations in international asset holdings. However, the data only permit us to examine a relatively short time period: another element to this question is to investigate the sources of persistent shifts in net foreign asset positions. For instance, the revaluation effects induced by currency and asset price movements may generate much volatility in the value of external assets and liabilities but it is an open question as to how important are revaluation 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 the net foreign asset positions over time: for instance, the impact effect may primarily operate through the revaluation effect, but with also a longer-term contribution via gradual adjustment in the current account to a sustained real exchange rate movement.

F. The Valuation Channel in International Macroeconomic Models

The standard approach in both the traditional Mundell-Fleming approach and contemporary "new open economy macroeconomics" is to consider scenarios in which the initial net foreign asset position is zero. This obviously 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 net foreign asset position imbalances, since exchange rate movements generate a net valuation effect that has obviously asymmetric effects on the home and foreign countries. One implication is that countries will disagree about the optimal 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 US data, he shows that in the case that the foreign-currency share of foreign assets is larger than the foreign-currency share of foreign liabilities, 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. 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.

V. POLICY IMPLICATIONS

As was emphasized in discussing equation (5) 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 true net foreign asset positions 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 US 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 increasing bite for major debtors among the advanced nations.

Indeed, it is interesting to speculate on the trend implications of financial globalization for exchange rate volatility. Along one dimension, if financial globalization leads to improved 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 mould 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 dirct 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 contemporaneous 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 substantial policy questions about optimal external capital structure and the exploitability of the valuation channel as an adjustment mechanism.

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 "120 Years After Bretton Woods" conference in 2064.

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Appendix

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, 1999-2002

	Net outflows		Change in IIP	
	Billions US$	Ratio of 2002 GDP	Billions US$	Ratio of 2002 GDP
Japan	437	11.0%	309	7.8%
Switzerland	132	49.1%	74	27.6%
Canada	59	8.0%	-134	-18.2%
Norway	55	28.9%	61	32.2%
Denmark	15	8.6%	11	6.2%
Sweden	8	3.5%	-42	-17.4%
Euro Area	0	0.0%	-217	-3.3%
New Zealand	-8	-13.6%	-4	-65%
Australia	-59	-14.7%	-46	-11.5%
United Kingdom	-93	-5.9%	134	8.5%
United States	-1636	-15.6%	-1511	-14.4%

Table 2. Gross capital flows to and from industrial countries (1999-2002)

	Capital inflows		Capital outflows		Change in foreign liabilities		Change in foreign assets	
	billions US$	ratio of 2002 GDP	billions US$	ratio of 2002 GDP	billions US$	ratio of 2002 GDP	billions US$	ratio of 2002 GDP
United States	3239	31%	1602	15%	1810	17%	299	2.9%
Euro Area	2923	44%	2923	44%	...	...	...	...
United Kingdom	1802	115%	1709	109%	1364	87%	1497	95.6%
Switzerland	308	115%	439	164%	241	90%	315	117.7%
Canada	192	26%	251	34%	308	42%	174	23.7%
Sweden	172	71%	181	75%	70	29%	28	11.7%
Australia	144	36%	85	21%	127	32%	81	20.3%
Denmark	114	66%	129	75%	94	55%	105	60.9%
Norway	96	51%	151	79%	119	63%	181	94.9%
New Zealand	21	36%	13	22%	24	41%	20	34.7%
Japan	-16	-0.4%	421	10.6%	-243	-6%	66	1.7%

Source: IMF, International Financial Statistics and authors' calculations.

Table 3. Net capital flows to emerging markets, 1999-2002

	Total		excluding IMF and exceptional financing	
	billions US$	Ratio of 2002 GDP	billions US$	Ratio of 2002 GDP
		"Borrowers"		
Brazil	79.2	17.5	62.2	13.8
Mexico	61.8	9.7	69.6	10.9
Poland	30.2	15.8	30.2	15.8
Argentina	21.1	22.8	1.1	1.2
Czech Republic	12.1	17.4	12.1	17.4
Turkey	11.9	6.5	-9.3	-5.0
Hungary	9.3	14.3	9.3	14.3
		"Lenders"		
Russia	-89.4	25.9	-91.7	-26.5
China	-67.7	5.3	-67.7	-5.3
Taiwan pr. of China	-62.5	22.2	-62.5	-22.2
Korea	-50.4	9.2	-34.4	-6.3
Thailand	-35.4	27.9	-36.4	-28.7
Indonesia	-33.3	19.2	-33.5	-19.3
Malaysia	-27.7	29.2	-27.7	-29.2

Source: IMF, International Financial Statistics, and authors' calculations.

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

	1982	1992	2002
Average net external position	-26.7%	-21.1%	-20.6%
Average external assets	16.6%	26.5%	61.1%
of which:			
foreign exchange reserves	5.1%	11.1%	19.4%
FDI + portfolio equity	0.5%	2.0%	9.3%
Average external liabilities	43.3%	49.9%	81.7%
of which:			
FDI + portfolio equity	5.1%	9.6%	34.5%

Source: authors' calculations based on Lane and Milesi-Ferretti (2001) and IFS.

Table 5. Gross capital flows to and from emerging markets, 1999-2002

	Capital inflows				Capital outflows			
	Total		Excluding IMF and except. fin.		Total		FX reserves	
	billions US$	Ratio of 2002 GDP	billions US$	Ratio of 2002 GDP	billions US$	Ratio of 2002 GDP	billions US$	Ratio of 2002 GDP
China	191.5	15.1	191.5	15.1	259.2	20.5	142.0	11.2
Taiwan prov. of China	69.9	24.8	69.9	24.8	132.4	47.0	72.1	25.6
Korea	40.0	7.3	56.0	10.2	90.4	16.5	66.1	12.1
Philippines	54.0	70.3	53.8	70.1	67.2	87.5	3.9	5.1
Brazil	96.8	21.4	79.7	17.6	17.5	3.9	-6.4	-1.4
Mexico	68.9	10.8	76.7	12.0	7.1	1.1	18.2	2.9
India	32.9	6.7	33.3	6.8	37.9	7.7	41.0	8.3
Poland	42.5	22.2	42.5	22.2	12.3	6.4	1.0	0.5
Chile	27.8	41.2	27.8	41.2	22.2	33.0	-0.8	-1.3
Indonesia	-21.6	-12.5	-21.8	-12.6	11.7	6.7	10.8	6.2
Thailand	-25.2	-19.9	-26.2	-20.7	10.2	8.0	8.5	6.7

Source: authors' calculations based on IMF, International Financial Statistics and national sources

Table 6. Decomposition of change in foreign assets for selected emerging markets, 1991-2002
(ratios of GDP)

	Change in net foreign assets	Cumulative current account		Cumul. capital acct + errors & omissions	Other factors		Change in real effective exch. rate
		Cumulative trade balance	Cumulative investm. Income		Growth effect	K-gains etc	
	$b_{2002} - b_{1990}$	$\sum_{1991}^{2002} bgst$	$\sum_{1991}^{2002} \frac{i_t^A A_{t-1} - i_t^L L_{t-1}}{Y_t^\$}$	$\sum_{1991}^{2002} (ka_t + eo_t)$	$\sum_{1991}^{2002} -\frac{g_t}{1+g_t} b_{t-1}$	$\sum_{1991}^{2002} \frac{KG_t}{Y_t^\$} - \left[\frac{\pi_t - d_t}{(1+g_t)(1+\pi_t)}\right] b_{t-1}$	
Brazil	-31.7%	2.8%	-30.6%	-0.6%	10.8%	-14.1%	-47.9%
Hungary	-24.7%	-9.2%	-40.4%	9.5%	12.3%	3.1%	60.2%
Indonesia	-5.0%	59.3%	-53.3%	0.8%	17.6%	-29.4%	-16.1%
Mexico	-11.2%	-6.2%	-36.3%	-2.9%	15.6%	18.6%	32.5%
Thailand	-9.4%	31.0%	-31.8%	-6.7%	21.7%	-23.6%	-18.2%
Turkey	-18.8%	14.2%	-23.1%	-0.1%	11.6%	-21.5%	-2.9%

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

Table 7. Exchange Rates and Rates of Return on Foreign Assets

	(1)	(2)	(3)	(4)	(5)
	Total	FDI	Port_Eq	Port_Debt	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.

Table 8. Exchange Rates and Rates of Return on Foreign Liabilities

	(1)	(2)	(3)	(4)	(5)
	Total	FDI	Port_Eq	Port_Debt	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*	-1.96	-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.

Table 9. US: Relative Contributions of Flows, Market Values and Exchange Rates to Dynamics of the International Balance Sheet, 1990-2001

	Mean			St Dev		
	1990-2001	1990-1995	1996-2001	1990-2001	1990-1995	1996-2001
CON__FLOW _FA	0.069	0.056	0.081	0.029	0.032	0.022
CON__FLOW _FL	0.094	0.081	0.107	0.031	0.031	0.028
CON_MV _FA	0.034	0.030	0.039	0.086	0.090	0.090
CON_MV _FL	0.028	0.023	0.034	0.063	0.056	0.073
CON_ER _FA	-0.005	0.008	-0.018	0.022	0.016	0.021
CON_ER _FL	-0.002	0.000	-0.003	0.003	0.002	0.003

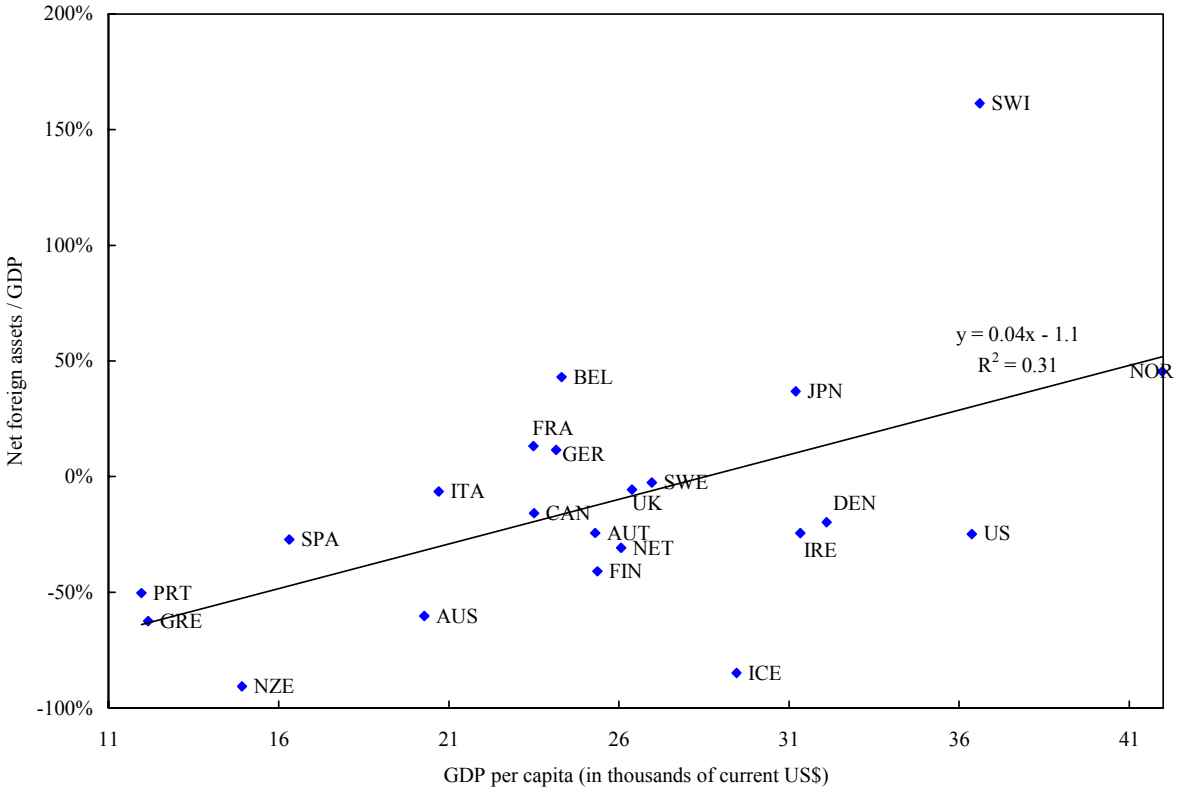
Source: US BEA. We thank Cedric Tille for kindly sharing in electronic form his history of the BEA data releases.

Table 10. Australia: Relative Contributions of Flows, Market Values and Exchange Rates to Dynamics of the International Balance Sheet, 1988.3-2001.2

	Mean			St Dev		
	1988.3-2001.2	1988.3-1994.3	1994.4-2001.2	1988.3-2001.2	1988.3-1994.3	1994.4-2001.2
CON__FLOW _FA	0.074	0.079	0.069	0.069	0.068	0.07
CON__FLOW _FL	0.081	0.088	0.074	0.033	0.038	0.028
CON_MV _FA	0.032	0.02	0.043	0.109	0.036	0.147
CON_MV _FL	0.015	0.011	0.018	0.047	0.037	0.056
CON_ER _FA	0.021	0.006	0.035	0.105	0.068	0.13
CON_ER _FL	0.01	0.005	0.015	0.047	0.045	0.049

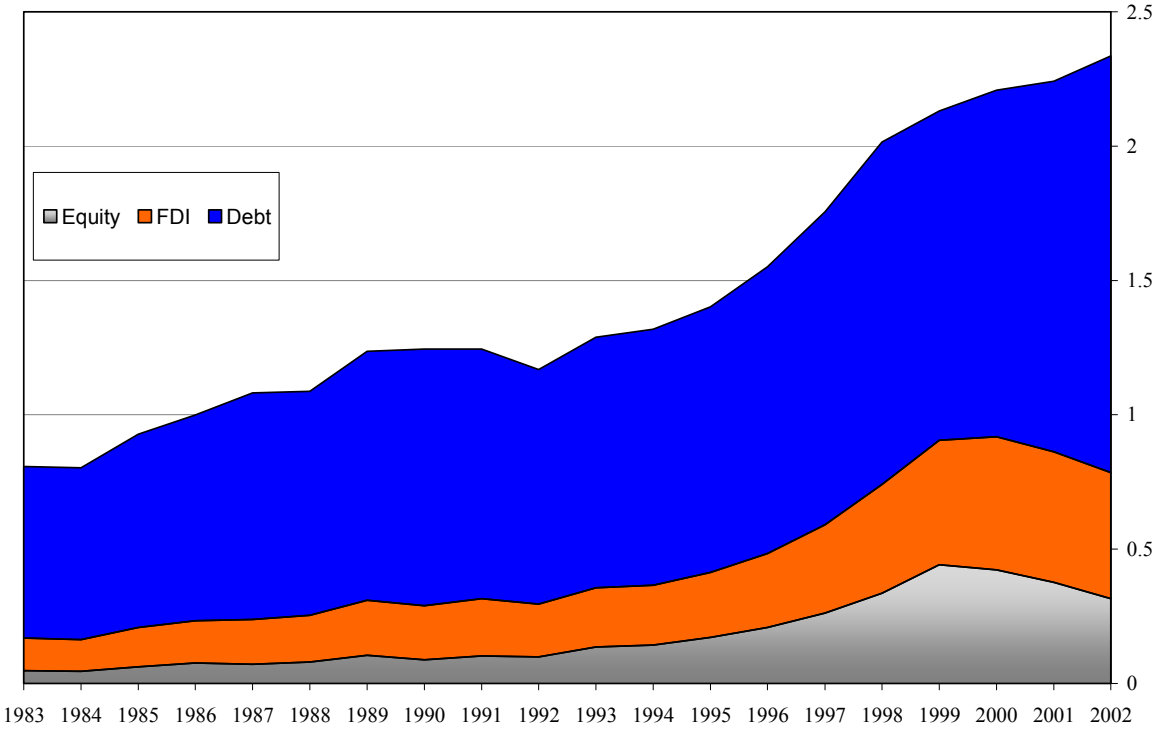
Source: Authors' calculations based on data from the Australian Bureau of Statistics.

Figure 1. Net foreign asset position (ratio of GDP) and GDP per capita
Industrial countries, 2002



Sources: IMF, International Financial Statistics and World Economic Outlook.

Figure 2. Composition of international portfolio, industrial countries
(sum of assets and liabilities as a ratio of GDP)



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: United States, United Kingdom, Austria, Belgium, Germany, Italy, Netherlands, Sweden, Switzerland, Canada, Japan, Spain. The sample choice is dictated by data availability.

Figure 3. Average and aggregate current account to GDP ratio
Emerging markets sample, 1970-2002

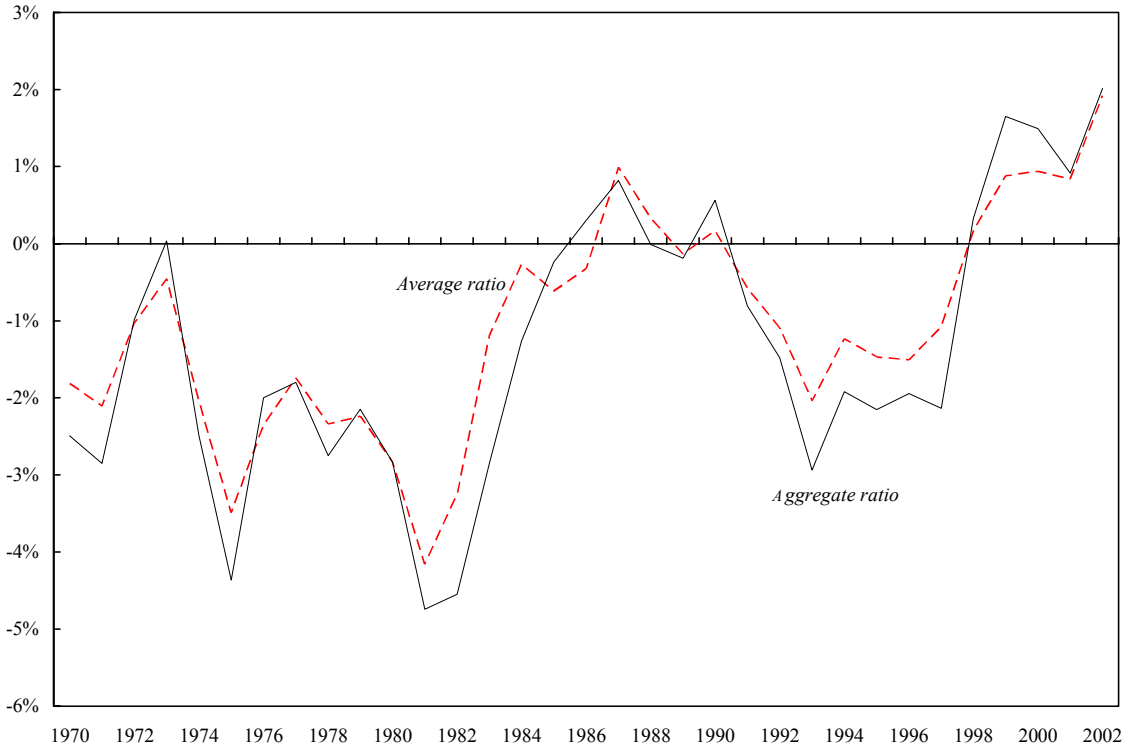


Figure 4. Average net external position, emerging market sample, 1982-2002

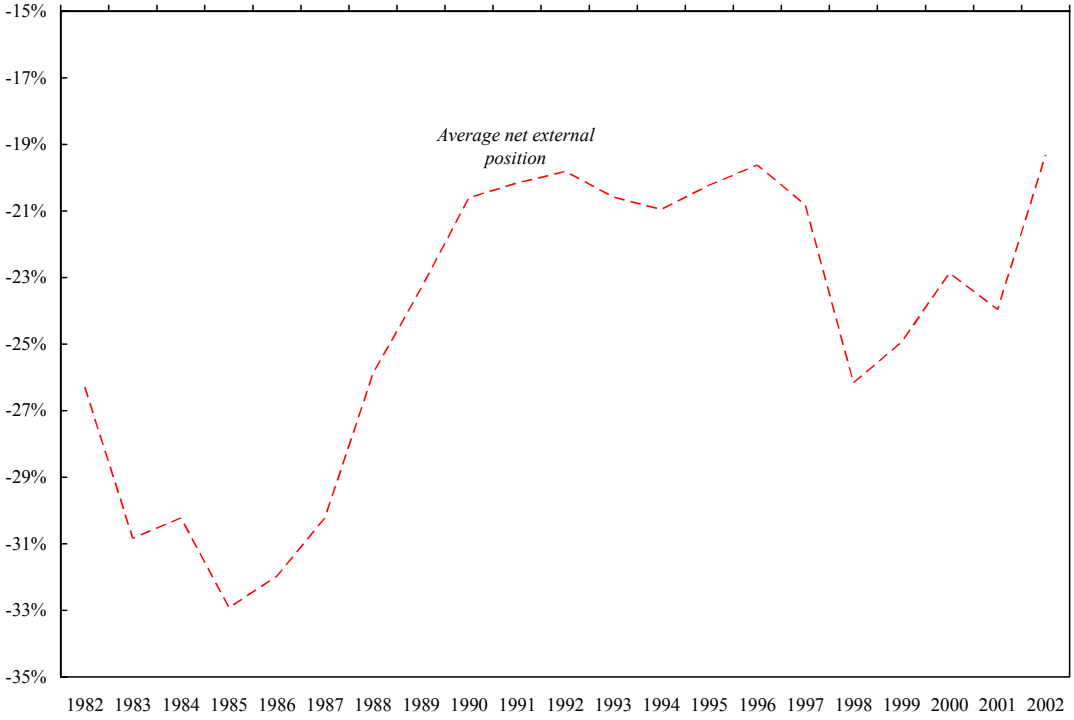
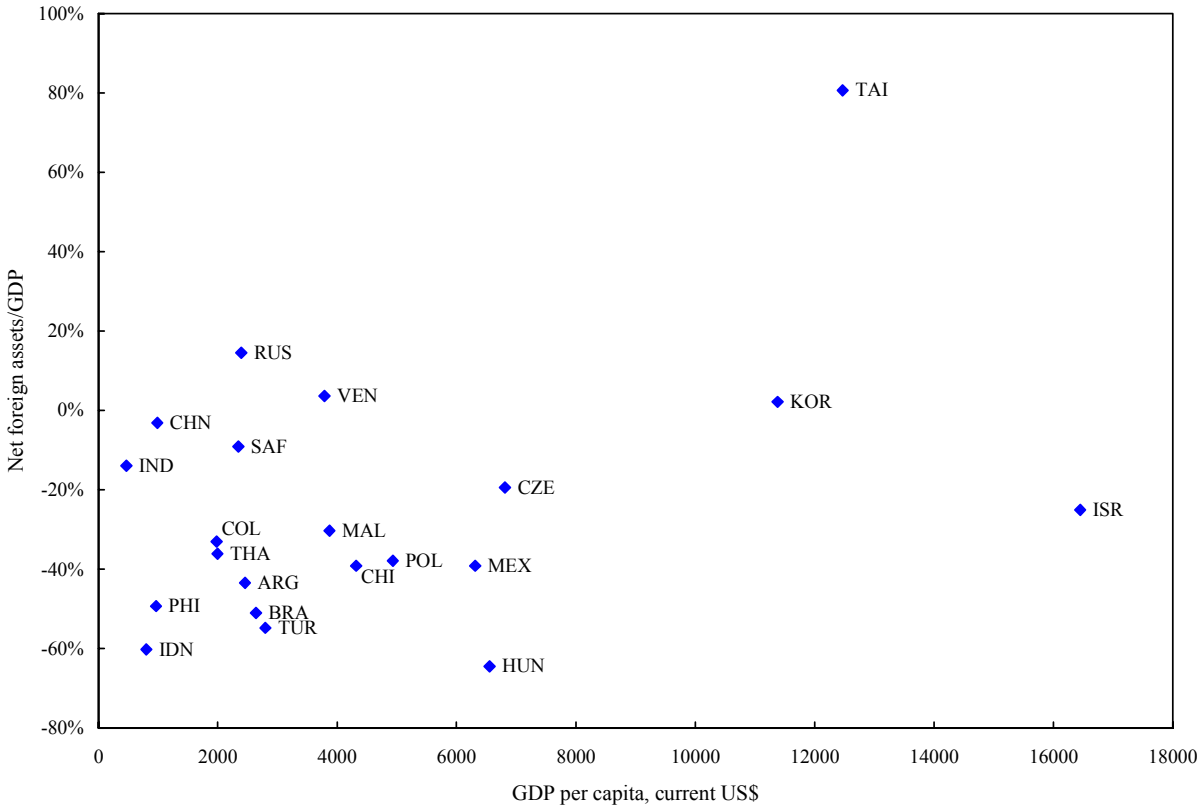


Figure 5. Net foreign assets and GDP per capita
Emerging markets sample, 2002



Sources: Authors' calculations based on IMF, International Financial Statistics and World Economic Outlook.

Figure 6. Indicators of international financial integration, emerging markets

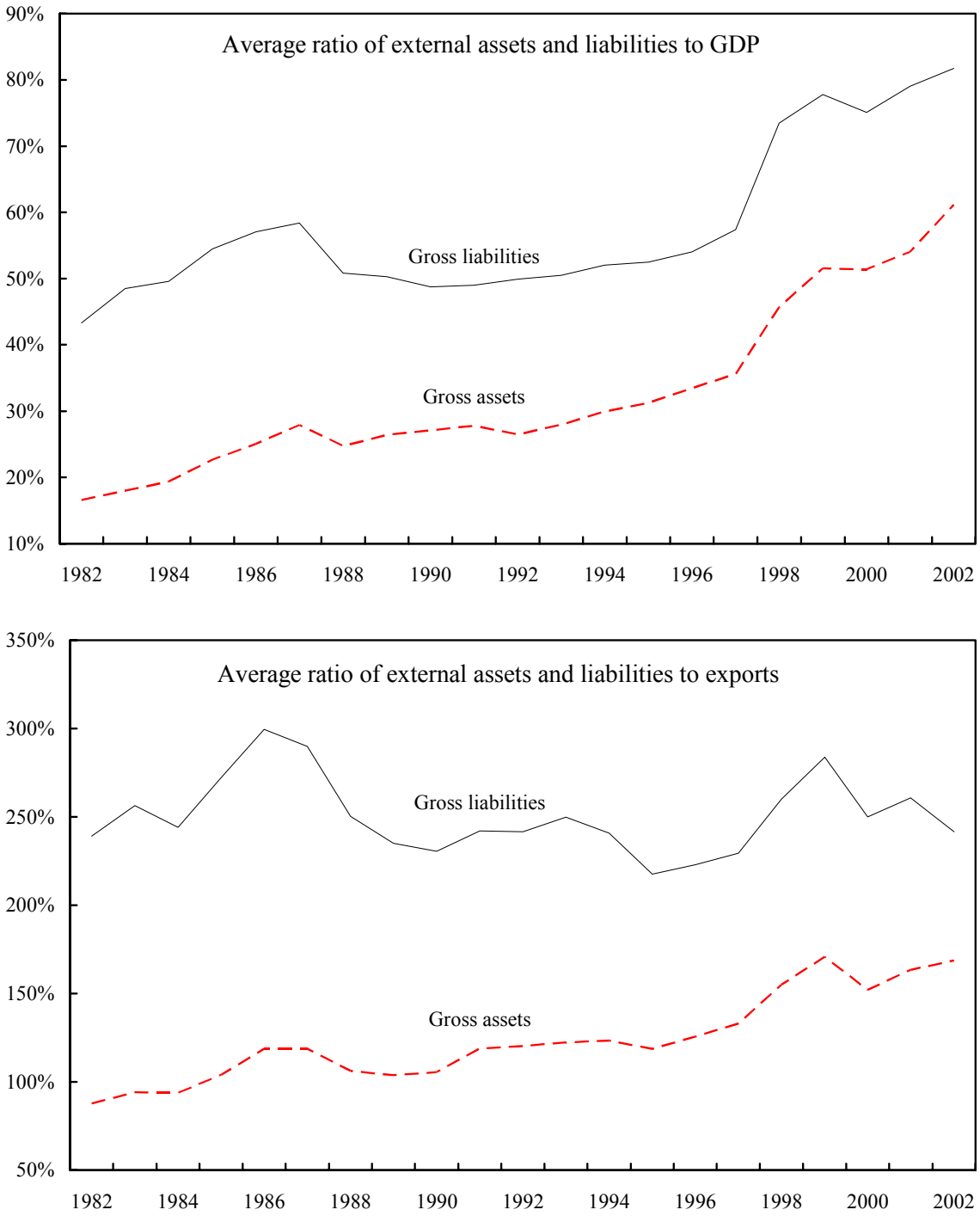
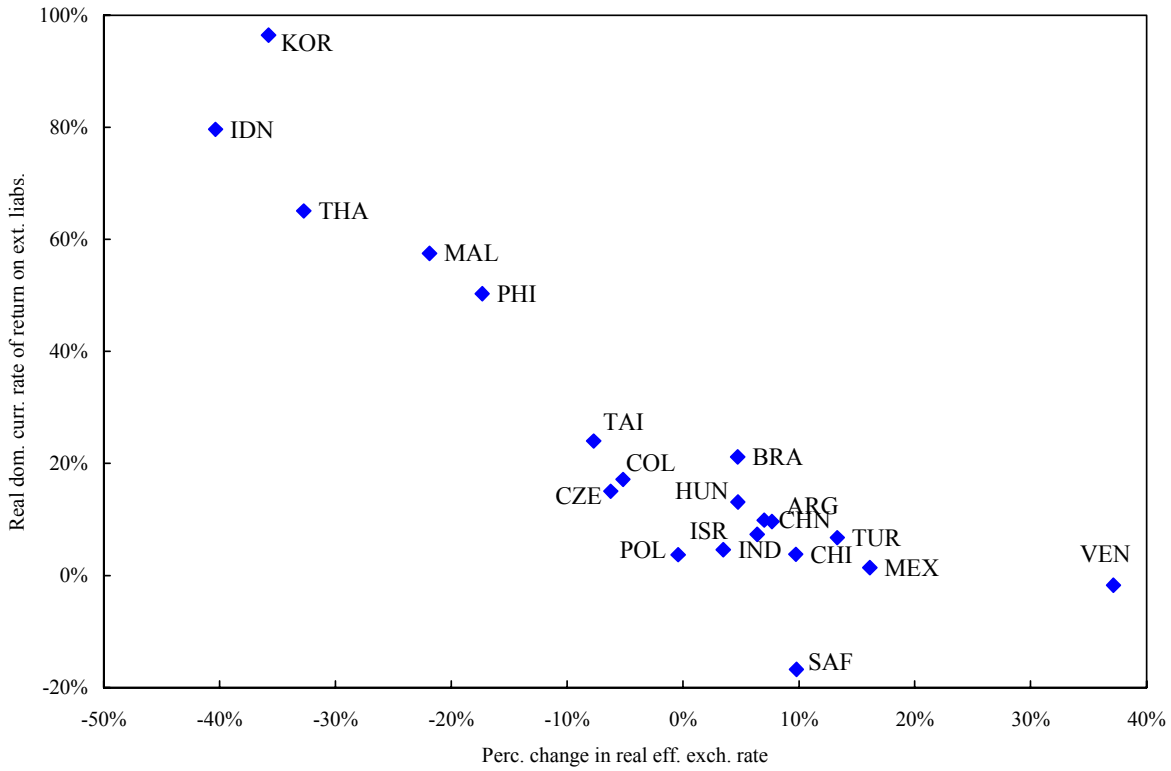


Figure 7. Real rate of return on external liabilities and changes in real exchange rate
Emerging market sample, 1997



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. Sources: authors' calculations based on IMF, International Financial Statistics and Information Notice System.