

THE EXTERNAL WEALTH OF NATIONS

Measures of Foreign Assets and Liabilities

For Industrial and Developing Countries

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Abstract

Although capital flows are closely monitored, surprisingly little is known about the accumulated stocks of foreign assets and liabilities held by various countries, especially in the developing world. This paper constructs estimates of foreign assets and liabilities and their equity and debt subcomponents for a sample of 67 industrial and developing countries. It characterizes the stylized facts of international balance sheets and asks whether there are trends in net foreign asset positions and shifts in debt-equity ratios over time. Finally, it explores the sensitivity of estimated stock positions to the treatment of valuation effects not captured in balance of payments data.

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<http://www.imf.org/EXTERNAL/PUBS/CAT/longres.cfm?sk&sk=3258.0>

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I. INTRODUCTION

The integration of world capital markets is an issue that lies at the top of the agenda for international macroeconomists. Although current capital flows are tracked on a daily basis, surprisingly little is known about the magnitudes of the stocks of foreign assets and liabilities held by various countries, especially in the developing world. This is a severe empirical constraint for several reasons. First, the level of net foreign assets is a key state variable in many open-economy models of growth and business cycles, and a fundamental determinant of external sustainability. Second, many of the benefits of international financial integration are tied to gross holdings of foreign assets and liabilities, which are not captured by net flow data. Third, the composition of international investment positions between equity (portfolio and FDI) and debt may be important in understanding vulnerability to external shocks and the degree of international risk sharing.

In order to address such questions, the goal of this paper is to construct estimates of foreign assets and liabilities and their subcomponents for 67 countries for the period 1970-1998, using balance of payments data. We also explore the sensitivity of estimates of stock positions to the treatment of valuation effects that are not captured in balance of payments data, and show that these effects are indeed quantitatively important for a number of countries. Finally, we briefly characterize some stylized facts regarding our estimated stocks and ask whether there are trends in net foreign assets and shifts in their composition over time.

The estimates are based on stock measures, when available, supplemented by cumulative capital flows, with appropriate valuation adjustments. In particular, we estimate stocks of equity and foreign direct investment based on flow data that are adjusted to reflect the effect of changes in market prices and exchange rates. Data on countries' international investment positions have been published by the International Monetary Fund in recent years for most industrial and a few developing countries, with coverage typically starting in the 1980s. For those countries, the paper provides longer time series for assets and liabilities, based on (adjusted) cumulative flows. A comparison of the measures we construct with existing stock data provides a robustness check on our methodology. For developing countries, the contribution of the paper is more substantial because stock data are generally available only for external debt and foreign exchange reserves.

The methodological contribution of the paper consists in the presentation of a simple accounting framework, starting from variations in the stock of foreign assets as measured by the current account balance. This framework highlights the link between balance of payments flows and the underlying stocks, as well as the impact of unrecorded capital flight, exchange rate fluctuations, debt reduction, and valuation changes not captured in a ‘crude’ cumulative current account. The most direct precursors of our work are Sinn (1990) and Rider (1994). Sinn (1990) constructs detailed measures of foreign assets and liabilities for 145 countries, using data from the IMF, the United Nations and national sources. This is by far the most comprehensive study undertaken on this subject; however, it covers the period 1970-87, therefore missing the large increase in international capital flows and the changes in their composition that took place over the last decade.¹ Rider (1994) undertakes a similar exercise for the period 1984-93, focusing mostly on industrial countries.

Our data document the growth of gross stocks of equity and FDI in relation to GDP in both industrial and developing countries. In developing countries, output per capita is strongly positively correlated with the net external position, and greater trade openness is associated with larger gross stocks of FDI and equity. More open and larger countries have greater equity-debt ratios. Among industrial countries, the cross-sectional link between GDP per capita and net external position is weaker, and richer countries tend to have more FDI and portfolio equity assets. We view these stylized facts as a promising start for an investigation of the causes and effects of countries’ external wealth. The remainder of the paper is structured as follows. Section II presents the framework for estimating foreign assets and liabilities. Section III describes the data. Sections IV and V present the results for industrial and developing countries, respectively, and Section VI concludes.

II. BALANCE OF PAYMENTS ACCOUNTING

The net external position of a country NFA is given by the sum of the net debt position, the net equity stock position and the net FDI stock position:

$$NFA_t = FDIA_t^* + EQA_t^* + DEBTA_t^* + FX_t - FDIL_t^* - EQL_t^* - DEBTL_t^* \quad (1)$$

where $FDIA^*(L)$, $EQA^*(L)$ and $DEBTA^*(L)$ are the stocks of direct investment, portfolio equity and debt assets (liabilities) and FX are foreign exchange reserves. This section discusses how to estimate level and composition

of countries' external wealth in the absence of measures for all external assets and liabilities on the RHS of (1), using balance of payments data on current account and capital flows. Table 1 lists the various components of the balance of payments according to the IMF's Balance of Payments Manual 5, with flows defined as changes in the corresponding stocks. In recent years, the IMF's Balance of Payments Statistics also publishes data on countries' International Investment Position (IIP), which are direct measures of the stocks of external assets and liabilities. These data are available for around 30 countries in our sample, for an average period of 15 years. The aim of our analysis is to provide alternative IIP estimates using a consistent methodology that will also cover countries/time periods for which stock data are not available.

The FDI category reflects a "lasting interest" of an entity resident in one economy in an enterprise resident in another economy (IMF, 1993). This includes greenfield investment as well as equity participation giving a controlling stake (typically set at above 10%), while remaining equity purchases are classified under portfolio equity investment. This implies that in certain cases the distinction between these two categories can de facto be blurred, but the issue cannot be clarified further in the absence of detailed disaggregated data. Among the balance of payments components listed in Table 1, the capital account includes capital transfers, associated with migrants, debt forgiveness or other government transfers (see IMF, 1993). Exceptional financing includes arrears on principal and interest payments on external liabilities, loans contracted for 'balance of payments needs' as well as the impact of debt reduction or forgiveness operations. We postpone a further discussion of these items until sub-section B. We treat both exceptional financing and IMF loans as sources of changes in the stock of external debt.

We group the components of the capital and financial account in three main categories: FDI, portfolio equity and debt. In this context, an important issue to address is the treatment of net errors and omissions (*EO*). This item measures (net) unrecorded transactions, that could reflect mismeasurement of the current account, the financial account or both. If it reflects unrecorded trade transactions, we should adjust the current account accordingly. If it reflects unrecorded financial account transactions, we should add it to capital flows. In the paper we assume that *net errors and omissions capture unrecorded capital flows*, given the prevalence of

capital flight in several developing countries for long periods of our sample. For the purpose of this discussion, we make the additional assumption that EO reflect changes in the stock of debt assets held abroad by domestic residents.² Let A and L indicate assets (outflows) and liabilities (inflows), respectively. Then

$$\begin{aligned}\Delta FDI &= -(\Delta FDI A + \Delta FDI L) \\ \Delta EQ &= -(\Delta EQ A + \Delta EQ L) \\ \Delta DEBTL &= \Delta PDL + \Delta OL + \Delta IMF + \Delta EF \\ \Delta DEBTA &= -(\Delta PDA + \Delta OA + EO)\end{aligned}\quad (2)$$

where ΔFDI is net outflows of foreign direct investment, ΔEQ is net portfolio equity investment and $\Delta DEBTL$ and $\Delta DEBTA$ are changes in debt liabilities and assets, respectively. Hence, accumulation of external debt assets can occur through portfolio debt, other assets or errors and omissions, in addition to foreign exchange reserves. Accumulation of debt liabilities can instead occur through portfolio debt, other liabilities, borrowing from the IMF or ‘exceptional financing.’ From the above definitions and from those in Table 1 one obtains:

$$CA = \Delta EQ + \Delta FDI + \Delta DEBTA - \Delta DEBTL - \Delta KA + \Delta FX \quad (3)$$

The cumulative current account between dates s and t equals the cumulative value of flows on the RHS of (3):

$$\sum_s^t CA_i = DEBTA_s(t) - DEBTL_s(t) + EQ_s(t) + FDI_s(t) + FX_s(t) - KA_s(t) \quad (4)$$

where $X_s(t)$ is the cumulative value of ΔX between s and t . We examine how the cumulative flows of equation (4) relate to the stock measures of eq. (1) that we are trying to estimate.

A. Capital Transfers and The Initial Foreign Asset Position

Even disregarding valuation effects, measuring net foreign assets of a country with cumulative flows requires some assumption about initial stock values. Using equation (4), we can approximate (1) as follows:

$$\begin{aligned}NFA(t) &\approx NFA(s-1) + \sum_s^t CA_i + KA_s(t) \\ &= NFA(s-1) + DEBTA_s(t) - DEBTL_s(t) + EQA_s(t) - EQL_s(t) + FDIA_s(t) - FDIL_s(t) + FX_s(t)\end{aligned}\quad (5)$$

Equation (5) highlights two alternative methods of estimating NFA. The first consists in cumulating the current account, adjusting for the capital account balance (which reflects primarily net capital transfers, rather than increases in indebtedness). We call this NFA measure adjusted cumulative current account ($ACUMCA$).

Example 1. Capital account transfers in Canada. *During the period 1988-97 Canada's cumulative current account deficit was US\$146 billion (about a quarter of 1997 GDP). Cumulative capital account transfers to Canada during the same period (mainly reflecting immigration of wealthy individuals) totaled US\$58 billion (close to 10 percent of 1997 GDP), substantially reducing the increase in net external liabilities.*³

The second method, which we use for developing countries, consists in adding up the individual stock estimates for debt, portfolio equity, FDI and reserves (adjusted cumulative flows--*ACUMFL*). In an accounting sense, these two methods are equivalent, but they may cease to be so once we make use of existing stock measures for some of the cumulative capital flows, as we discuss below and in Section II.D. Note also that if errors and omissions reflect unrecorded trade transactions, instead of financial account transactions, we should adjust the current account by their cumulative value as well.

We address the initial value problem for NFA (for $s=1970$) in two ways. The first, used for *ACUMFL*, consists in calculating initial *NFA* as the sum of its estimated stock components. In particular, we use existing stock measures for foreign exchange reserves and, for developing countries, external debt. The initial stock of FDI liabilities for developing countries is determined by cumulating flows using as initial value the stock of industrial countries' FDI in developing countries in 1967 (OECD, 1972). For initial debt assets, we use the value reported by Sinn (1990) and, for the remaining stocks, cumulative flows or national sources. The second method, used for *ACUMCA*, takes as initial value either an existing estimate of NFA (from Sinn (1990) or national sources), or the cumulative current account from the 1950s (with valuation adjustments, discussed below). We use the same NFA components as for *ACUMFL* except for debt assets, determined residually given *ACUMCA* and all other estimated stocks. The difference between these two methods is made clearer in Section II.D.⁴

B. How to Account for Debt Reduction and Forgiveness

If a country's external debt is reduced because of debt forgiveness or because debt restructuring has reduced its face value, the cumulative current account will overstate the size of the country's liabilities because the reduction in debt liabilities is not reflected in the current account balance. To address this problem, we make

use of the World Bank's Global Development Finance database, which under 'debt reduction and forgiveness' reports the total amount of debt reduction, excluding debt-equity swaps, as well as debt forgiven. We then adjust the cumulative current account so as to reflect the impact of these debt reduction operations.⁵

Example 2. Debt reduction in Chile *During the period 1987-1990, Chile's cumulative current account deficit was around US\$2 billion. However, net external liabilities declined substantially because debt forgiveness and reduction operations reduced external debt by over \$8 billion (over 25% of 1990 GDP).*

C. Valuation issues

Price and exchange rate changes have an impact on the value of external assets and liabilities that are not captured in the corresponding flows. For debt assets, debt liabilities and foreign exchange reserves, valuation changes are primarily due to exchange rate fluctuations. When stock data are available (for example, on external debt for developing countries and foreign exchange reserves for all countries) we can simply substitute in eq. (5) the value of the underlying stock for the cumulative flow, and correspondingly adjust *ACUMCA* for the implicit capital gains and losses. The impact of currency fluctuations on the US dollar value of external debt for developing countries is obtained from World Bank data, while the impact of valuation changes on reserves is calculated as the difference between the change in the stock of reserves and the flow measured in the balance of payments statistics.

Example 3. Indonesia's external debt *During the early 1990s, over a third of Indonesia's external debt was denominated in Japanese yen. The yen's appreciation vis-à-vis the US dollar during 1990-95 implied a significant increase in the dollar value of external debt. For example, in 1994 Indonesia's current account deficit was US\$2.8 billion, but the yen's appreciation led to an additional increase in the US\$ value of external debt of US\$4.4 billion, over 2 percent of GDP. The yen's subsequent depreciation in 1995-97 had the opposite effect.*

Valuation issues are more complex for equity and FDI. The problem here is the lack of stock data that are comparable across countries.⁶ In order to estimate equity stocks, we cumulate flows adjusting outstanding US dollar stocks for changes in stock market values. For equity liabilities, stocks are adjusted for changes in the

end-year US\$ value of the domestic stock market; for equity assets, stocks are adjusted analogously by a ‘world’ portfolio index, the Morgan Stanley Capital Index (see Appendix I). Stocks estimated with this method track the IIP stock measures for most countries more accurately than unadjusted cumulative flows.

Example 4. Portfolio equity adjustments: United Kingdom. *The inflow of portfolio equity in the United Kingdom during 1996 was around US\$9 billion and the current account deficit below US\$1 billion. Due to the increase in the UK stock market, we estimate that the stock of equity liabilities increased by US\$66 billion, quite close to the US\$59 billion increase in the stock of equity liabilities reported in the IMF’s BOPS.*

The value of FDI stocks can be calculated using different methods, as discussed by Eisner and Pieper (1991) for the US and Pratten (1992) for the United Kingdom (see also Lane and Milesi-Ferretti 1999). A first method, historical cost, consists in simply cumulating US\$ flows. A second method consists in estimating ‘book value,’ adjusting the stocks for the effects of exchange-rate changes (see Appendix). A third method, replacement cost, takes into account the effect of inflation on the cost of replacing existing capital. Finally, a fourth method consists in adjusting the value of stocks to reflect their current market valuation.

Given that the difference between portfolio equity investment and FDI can be blurred in some cases, we would ideally want to estimate both stocks according to the same methodology. However, estimating the market value of FDI would require data which is unavailable for all but very few industrial economies, and in particular a breakdown between reinvested earnings and new direct investment flows (see Pratten (1992)). Hence, we have chosen the ‘book value’ adjustment for FDI in constructing NFA positions, even though valuation differences with market values can be substantial (see example below). Most countries reporting IIP estimates of FDI stocks do so based on book value (see IMF (1993) and Rider (1994)), and indeed our adjustment seems to track available stock measures of direct investment more accurately than other methods. Estimates based on cumulating dollar flows, with no adjustment (historical values) and adjusting stocks for increases in the price of capital goods (replacement cost) are available in the data set.

Example 5. Impact of valuation adjustments on US FDI. *According to data from the US Department of Commerce, the stock of US FDI abroad in 1998 increased by \$119 bn at current cost and \$356 bn at market*

value, with the underlying flow measuring \$133 bn. The difference was due to price changes (current cost, +\$2.9 bn; market value, +\$217.4 bn); exchange rate changes (current cost, +\$2.0 bn ; market value, +\$12.8 bn); and other valuation changes (current cost: -\$18.7 bn ; market value, -\$7.0 bn). Our estimate of the increase in the stock of US FDI abroad for 1998 is US\$105 bn.

D. Mismeasurement of gross capital flows and net external position

For developing countries, measures of external debt DWB (from the World Bank's Global Development Finance Database) can be used instead of the cumulative flow $DEBTL$. This changes the NFA estimate in (4)-(5) by $DWB(t)-DWB(s-1)-DEBTL_s(t)$. In most cases, this difference is positive, and it is substantial for several developing countries, even after controlling for the impact of cross-currency fluctuations and debt forgiveness.

Example 6. Debt accumulation in Argentina During 1977-81, cumulative debt inflows in Argentina measured US\$7.9 bn, while the debt stock (net of the effect of currency fluctuations) increased by US\$24.8 bn, a difference of over 20% of Argentina's 1981 GDP.

Assuming that debt stocks are measured correctly, this discrepancy implies that the capital inflows reported in the balance of payments statistics underestimate actual inflows. If the current account and net flows are also measured correctly, changes in indebtedness can exceed the recorded flow of new external liabilities by an amount equivalent to unrecorded capital outflows (over and above errors and omissions). Hence the difference between the debt stock DWB and the cumulative sum of $\Delta DEBTL$ (corrected for cross-currency valuation effects and debt reduction) plus cumulative errors and omissions give a measure of the stock of unrecorded assets held abroad by domestic residents (see Lane and Milesi-Ferretti (1999)). The large literature on measuring capital flight (e.g. Cuddington (1986), Dooley (1988) and Claessens (1997)) deals explicitly with this question.

The $ACUMCA$ measure of net foreign assets estimates debt assets residually as the difference between $ACUMCA$ and the sum of the stock of reserves, net FDI and equity stocks, plus external debt liabilities. Hence this estimate includes, in addition to cumulative recorded outflows, the difference between the debt stock and the cumulative flow of debt liabilities (as well as cumulative errors and omissions). Our second measure,

ACUMFL, calculates *NFA* for developing countries as the sum of the various stocks/cumulative flows, estimating debt assets as cumulative recorded debt outflows plus errors and omissions, and hence does not include the difference between the debt stock and the cumulative flow of debt liabilities.⁷

III. THE DATA

The main sources of our data are the International Monetary Fund's Balance of Payments Statistics (BOPS) and International Financial Statistics (IFS); the World Bank's World Debt Tables and Global Development Finance (GDF); the OECD statistics on external indebtedness; the Bank for International Settlements' data on banks' assets and liabilities by creditor and debtor (BIS), and Sinn (1990). Our sample is divided into industrial and developing countries.⁸ The distinction is to some degree arbitrary: Singapore, for example, is classified as a developing country but, by the 1990s, had an income per capita higher than most industrial countries. Our sample does not include transition economies⁹ and developing countries with per capita income below \$1500 in 1985 (according to Summers and Heston) or population below 1 million.¹⁰ Several industrial and a few developing countries report International Investment Position (IIP) data on *NFA* and its composition (published in BOPS and IFS). When these data are available, we have compared them to our estimated stocks.

Debt assets and liabilities

The only direct measures available for debt assets are those reported in IIP. For our *NFA* measure, we use the two estimates discussed in Section II.D. The first relies on cumulative flows (see eq.(4)), taking as initial value(s) the data reported by Sinn (1990). The second, 'residual' measure is obtained for developing countries by taking the cumulative current account (adjusted for the capital account, debt reduction and valuation effects) as the appropriate *NFA* measure and calculating debt assets as $DEBTA = NFA - FDI - EQ + DWB - FX$. Results using BIS data on banks' liabilities to a country's residents (available since 1983) are not reported but we discuss cases in which results differ significantly from those obtained using other definitions.

For industrial countries the only stock measures of debt liabilities are those reported in the IIP. In the absence of such data, we use the cumulated debt flows (equation (2)) but focus primarily on net debt. We also collected BIS data on debt to banks by a country's residents. For developing countries, we have two measures

of gross debt, reported by the World Bank and the OECD/BIS respectively. The first relies on a debtor-reporting system and focuses primarily on foreign-currency denominated debt. The second relies mainly on a creditor-reporting system and refers primarily to debt by a country's residents, regardless of the currency of denomination. In constructing NFA, we have primarily used World Bank data because it is available on a consistent basis for a longer time period (1970-98). The two measures are quite similar.¹¹

Foreign direct investment assets and liabilities

In addition to stock data reported directly in the IIP, the OECD publishes data on stocks of FDI assets and liabilities for most industrial countries, starting in the 1980s. For most countries, the data are consistent with the one presented in the IIP. We supplement these available stock data with cumulative flows, using BOPS as a source for the flows. For most countries we obtained flow data starting in the 1950s or early 1960s. For most developing countries, we use as initial value for inward FDI the stock of industrial countries' investment in those countries in 1967 as reported by an OECD study (1972).¹² Flows are used to construct several series, with different methods of valuation adjustment (see Lane and Milesi-Ferretti (1999)). In the paper we use an adjustment for relative price changes reflecting exchange-rate fluctuations (see Appendix).

Equity assets and liabilities

The only direct stock measures available are those reported in the IIP.¹³ In addition, we construct two alternative cumulative flow measures for both equity assets and liabilities: the first simply cumulates US dollar flow amounts, while the second adjusts past stocks for variations in the dollar price of equity and flows for variations in the price of equity between the end of the year and the average of the year. The 'price of equity' is taken to be the country's stock price index in US dollars for inward equity flows, and the MSCI index for outward flows (see Appendix). We use this second measure in the remainder of the paper.

Foreign exchange reserves

For all countries, we have used IMF data on foreign exchange reserves minus gold (IFS, line 1d.d). We have excluded gold holdings from the net external position, since they do not constitute a liability of another country. We have correspondingly subtracted the reported value of gold holdings from the IIP.

Net foreign asset position

We consider three alternative measures: (i) *ACUMCA*: the cumulated current account, adjusted to reflect the impact of capital transfers, valuation changes, capital gains and losses on equity and FDI and debt reduction and forgiveness; (ii) *IPNFA*: the net external position reported in the IIP section of *BOPS* and *IFS*, net of gold holdings; (iii) *ACUMFL*, given by the sum of the net equity and FDI positions (both adjusted for valuation effects), foreign exchange reserves and the difference between cumulated flows of ‘debt assets’ and the stock of debt measured by the World Bank (or the OECD). *ACUMCA* is available for both industrial and developing countries, for the period 1970-1998. *IPNFA* is available for industrial and a few developing countries, typically from or after 1980. Finally, *ACUMFL* is available for developing countries for the period 1970-98.

IV. NET FOREIGN ASSET POSITION

The overall trends in the net external position of industrial and developing countries as a ratio of GDP are depicted in Figure 1. Industrial countries as a whole experienced a deterioration in their NFA position, driven primarily by the worsening in the net external position of the United States. The average ratio of NFA to GDP for industrial countries has instead improved since the fall in the price of oil in 1985-86. For developing countries, fluctuations in the aggregate and average external position reflect the debt crisis, the subsequent improvement in the late 1980s, the new wave of capital flows in the early 1990s, the narrowing in external imbalances after the Mexican crisis and the impact of the Asian crisis.¹⁴ The fact that the aggregate NFA position for our sample is negative reflects, in addition to our incomplete country coverage, the global discrepancy in the measurement of the current account (see IMF 1987 for a detailed discussion). Indeed, the cumulative value of the world current account discrepancy (from the IMF’s World Economic Outlook) tracks very closely the aggregate external position of the countries in our sample.

Figure 2 plots different NFA measures as ratio of GDP for a selection of industrial countries for the period 1970-1998, where we have grouped together the countries belonging to the Euro area. Relatively few countries have maintained positive net foreign asset positions throughout the 1970-98 period (Germany, Japan, Netherlands and Switzerland); the rest of the group are almost evenly split between persistent debtors and

‘switchers.’ Among the latter, the most well known case is the United States. The fact that some countries have maintained permanently negative NFA positions that are quite large (e.g. Canada, Australia, New Zealand) suggests open access to international credit for these countries over a sustained interval.

ACUMCA gives a similar overall picture of trends in net foreign asset positions when compared to *IPNFA*, which is a direct estimate of the stock position. Nevertheless, there are some significant differences. For instance, *ACUMCA* is well below the Swiss *IPNFA*, while it substantially exceeds the Canadian position.¹⁵ Interestingly, the difference between the two estimates is strongly correlated with cumulative errors and omissions (0.75 for industrial countries). That is, for countries that experienced unrecorded capital outflows the *ACUMCA* estimate, which counts such outflows as assets accumulated by the country abroad, exceeds *IPNFA*, while the opposite is true with unrecorded inflows. In the data set, we provide the cumulative value of errors and omissions, which can be used to obtain alternative estimates of the official NFA position.

We focus next on the short-run variability of NFA. These can fluctuate quite sharply on a year-on-year basis, due to valuation changes induced by exchange rate and asset market fluctuations, not reflected in the current account. Table 2 provides evidence that our methodology is fairly successful in tracking the short-run variability in *IPNFA*, by showing correlations between the current account and first differences of *ACUMCA* and *IPNFA*, relative to GDP. For countries such as Germany, Italy and Spain, all correlations are high. For others (Australia, Netherlands, Switzerland, United Kingdom, US) the correlation between the current account and changes in *IPNFA* is low or even negative, but *ACUMCA* tracks changes in *IPNFA* much more closely.

Figure 3 plots NFA measures for 18 of the 45 developing nations in our sample. In Argentina, Indonesia, Mexico and Venezuela net external liabilities measured with *ACUMFL* are significantly larger than *ACUMCA*, reflecting unrecorded capital outflows. Many Latin American countries share similar NFA dynamics, with a sharp worsening during the 1982 debt crisis and an improvement starting in the late 1980s. Morocco and the Philippines also show a similar pattern. There is more heterogeneity among Asian countries: for example, Malaysia and Thailand share a brief improvement in NFA in the mid-1980s, followed by a period of increasing liabilities, while Singapore and Taiwan show an improving creditor position over time.

Table 3 summarizes the net external position of developing countries as of 1998 using both our NFA measures. Most of the countries in our sample are debtors, the most notable exceptions being Botswana, Kuwait, Singapore and Taiwan. The countries with the largest net external liabilities in our sample are Côte d'Ivoire, Jamaica and (with the *ACUMFL* measure) Indonesia.¹⁶ Table 4 reports the correlations between first differences of the various NFA measures and the current account. Correlations are generally high, but significantly below unity for several countries, in particular for the *ACUMFL* measure, confirming the importance of valuation adjustments.

C. Net Foreign Assets: Some Basic Correlations

In this subsection, we explore how NFA are related to country characteristics such as the level of development, size and openness to trade. For example, the 'stages' hypothesis predicts a positive relationship between the level of development and NFA (Eichengreen, 1991): as a country moves from capital-scarce to capital-abundant, it evolves from the status of a net debtor to a net creditor. The level of development could also influence the composition of NFA. In particular, the equity-debt ratio may be increasing in the level of GDP per capita. Also, higher education levels may be required to attract FDI inflows (Borensztein et al 1998); high domestic incomes may also attract foreign firms wishing to sell to the domestic market. With respect to portfolio equity, fixed costs in the formation of a domestic stock market and in information processing by international investment institutions may also generate a positive relationship between development and portfolio inflows (Calvo and Mendoza, 2000).

Similarly, trade openness may influence both level and composition of external liabilities via several channels. On the one side, the threat of trade sanctions in the event of default implies that a more open country may be a better credit risk and hence can borrow more (Milesi-Ferretti and Razin 1996, Lane 2000a). On the other side, openness may mean greater vulnerability to external shocks, leading to an increase in precautionary savings and the accumulation of foreign assets as a buffer against shocks (Ghosh and Ostry 1994, Lane 2000b). With respect to composition, the greater vulnerability of open economies means that equity-type liabilities may

be preferred to debt for risk sharing. Trade openness may also make a country attractive as a location for export-orientated FDI.

Finally, a country's economic size (total GDP) also may be important. A large country, for a given level of openness, may be more diversified and hence face less external risk than a smaller country. As argued earlier, a minimum economic scale may be necessary in order to pay the fixed costs required to set up a stock market or attract the interest of international investment institutions: holding constant output per capita, these fixed costs are easier to absorb the larger is total GDP.

The determinants of the net foreign asset position are explored in Table 5, using the average *ACUMCA* during the 1990s as measure of net foreign assets. Panel A reports regressions for the whole sample and for industrial and developing countries separately (including and excluding oil producers from the Arab peninsula). GDP per capita, trade openness and population in 1989 are taken from the Penn World Tables (see Summers and Heston 1991); trade openness is measured as the ratio of exports plus imports to GDP. The results show a generally positive relationship between net foreign assets and GDP per capita, in line with the 'stages' hypothesis. That the impact of GDP per capita is weaker in industrial than in developing nations (smaller and less significant point estimate) suggests that the true relationship may be nonlinear.

In addition, trade openness is positive and significant for the full sample and the industrial countries. Its effect is weaker for developing nations, possibly reflecting a high degree of collinearity between openness and GDP per capita in this sub-sample. An alternative interpretation is that openness has two conflicting effects on NFA: vulnerability encourages open countries to accumulate foreign assets as a buffer stock in anticipation of external shocks while the positive impact on credit risk enables a more open country to borrow more overseas (see Lane 2000a). The former effect may be dominant for rich open economies, since these may not face binding credit constraints; the latter effect may be more important for poorer nations that wish to borrow as much as feasible on external markets. Finally, holding fixed openness and the level of development, the effect of country size on NFA is positive and significant across sub-samples.

V. THE COMPOSITION OF THE NET EXTERNAL POSITION

The past decade has seen a remarkable growth in capital flows taking the form of portfolio equity and FDI, as documented in Figure 4. The stock of FDI in relation to GDP have been relatively stable in industrial countries during the 1970s and the early 1980s, but has shown a substantial increase since then, a trend which is common across countries. A similar trend has occurred for the stock of equity capital, fuelled by both larger equity flows and increasing stock market valuations. The stocks of FDI and equity liabilities show a similar rapid increase in developing countries, especially since 1990, while the stock of FDI and equity assets increase more slowly. As of end-1998, Chile, Costa Rica, Jamaica, Malaysia, Panama, Singapore and Trinidad and Tobago were among the countries with the highest FDI liabilities in relation to GDP, while Chile, Korea, Mexico, Singapore and South Africa have the largest portfolio equity liabilities.

We turn next to a brief empirical analysis, relating the average composition of the external position of developing countries during the 1990s to the same country characteristics identified earlier (openness to trade, size and GDP per capita). In Table 6, we analyze the impact of these determinants on FDI (Panel A), portfolio equity holdings (Panel B), net debt and the equity/debt ratio (Panel C). In each case, we examine gross stocks (assets and liabilities) in addition to net stocks.

With respect to FDI (panel A), we find that richer and more open countries tend to have more FDI assets. Interestingly, there is a strong correlation between openness and FDI liabilities for developing countries, so that their net FDI position is negatively correlated with openness.¹⁷ In other words, among the industrial nations, the relatively less developed are net recipients of FDI; among developing nations, it is the countries most open to international trade.

Panel B shows the results for portfolio equity holdings. Across subsamples, trade openness and country size tend to have significantly positive effects on gross equity assets and liabilities. More open countries have more positive net equity positions in the developing nation subsample but not among the industrial countries, suggesting a relationship that varies across levels of development.

Net debt positions and the equity-debt ratio are considered in Panel C (a positive value for net debt means a net lender; a negative value a net borrower). In columns (1)-(3), net debt is calculated as a residual by

subtracting other components from the overall net foreign asset position. For both the full and developing country samples, all three determinants are significantly positive. For developing countries, an alternative measure is employed in column (4) which subtracts the World Bank's measure of gross debt from holdings of foreign reserves and debt assets. Column (5) regresses gross debt liabilities on the three determinants for the developing nations subsample: smaller and poorer developing countries are found to have greater debt liabilities but openness is not significant. Finally, we study the equity/debt ratio in the composition of the foreign liabilities of developing countries in column (6), where equity is the sum of FDI and portfolio equity liabilities. Trade openness explains a high fraction of the cross-country variation in this ratio: in line with our theoretical priors, the mix of liabilities shifts from debt to equity in more open developing countries.

The regression results in Tables 5-6 should be viewed as initial attempts to establish some basic stylized facts concerning the level and composition of net foreign asset positions. In future work, we plan to expand the set of regressors, examine the time series dimension of the data and investigate structural models of the net foreign asset positions. The promising results from our 'first cut' investigations give us confidence that this is a potentially fruitful line of inquiry.

VI. CONCLUSIONS

In this paper we presented a data set on level and composition of external assets and liabilities for 67 industrial and developing countries. Clearly, the data we constructed have ample margins for error. Our estimates of FDI are based on book values, while our equity estimates are adjusted to reflect market value. Estimates of the gross debt position for industrial countries are hampered by the lack of data comparable to the external debt statistics for developing countries, and are not adjusted for the impact of cross-currency fluctuations. Measures of debt assets for developing countries are subject to the caveats well known from the capital flight literature. Nevertheless, our estimates are constructed on a consistent basis across countries, they match existing stock data quite closely and they fill an important gap. Indeed, modern international macroeconomics, with its emphasis on the intertemporal dimension, clearly needs comprehensive stock measures to supplement data on external debt and the flow data available through balance of payments statistics. We have focused in particular

on estimating stocks of portfolio equity and FDI, given both their increasing importance and the paucity of existing data.

Cross-sectional and time-series characterizations of these stocks provide interesting stylized facts deserving further scrutiny. Along the time series dimension, the data document the increasing degree of equity diversification during the past decade, with rising gross stocks of equity and FDI in relation to GDP in both industrial and developing countries, but especially in the former. Along the cross-sectional dimension, in developing countries GDP per capita is positively correlated with the net external position, and trade openness is associated with larger gross stocks of FDI and equity. In industrial countries the link between GDP per capita and net external position is weaker; richer countries tend to have more FDI and equity assets.

In conclusion, the data we have assembled can be used to address several interesting questions in international economics. The preliminary results discussed above are an initial step in investigating the determinants of countries' external wealth. In addition, the impact of stocks of foreign assets and liabilities on macroeconomic behavior is an important question that has not been empirically explored. For instance, these data allow us to revisit the classic 'transfer problem', investigating the long-run relation between real exchange rates and net foreign assets for a large set of countries (Lane and Milesi-Ferretti 2000).

Appendix

A. Estimation of Stocks of Portfolio Equity

Stock measures EQL and EQA are constructed based on cumulative equity flows, taken from the IMF's IFS and BOPS. For *equity inflows* ΔEQL , we adjust the stock outstanding at the end of the year $t-1$ for changes in the value of the stock market in US dollar terms between the end of the year $t-1$ and the end of the year t . The flows are assumed to occur uniformly during the year. We therefore calculate their end-of-year value by multiplying them for the ratio of the stock market value in US dollars at the end of the year (p^*) over its average during the year (\bar{p}^*). Hence:

$$EQL_t = EQL_{t-1} \frac{P_t^*}{P_{t-1}^*} + \Delta EQL_t \frac{P_t^*}{P_t^*} \quad (A1)$$

For *equity assets* we assume that all countries allocate their investment abroad in the same fashion, and that the composition of their portfolio reflects the Morgan Stanley Composite Index of world stock markets, p^{MS} .¹⁸

$$EQA_t = EQA_{t-1} \frac{P_t^{MS}}{P_{t-1}^{MS}} + \Delta EQA_t \frac{P_t^{MS}}{P_t^{MS}} \quad (A2)$$

B. Estimation of Stocks of Foreign Direct Investment

Estimates of the stock of FDI assets $FDIA$ and liabilities $FDIL$ are based on cumulative flows (including reinvested net profits), taken from the IMF's *IFS* (various issues), with initial values based on stock measures from various sources (see Sections II and III) or, when stocks were unavailable, cumulative flows using data back to the 1950s. Our book value estimation method assumes that the relative price of capital goods across countries follows relative CPIs. Therefore, the change in the domestic price of capital goods is the sum of the change in the relative price of capital between the country and the US (the currency of denomination of flows), plus the increase in the US price of capital. Since we do not make allowance for write-offs of existing capital and since, in the presence of inflation, nominal depreciation allowances imply that part of reinvested profits are simply offsetting real capital depreciation, we omitted the inflation-adjustment term. That is,

$$FDIL_t = FDIL_{t-1} \frac{rerus_t}{rerus_{t-1}} + \Delta FDIL_t \quad (A3)$$

where $rerus$ is the country's real exchange rate vis-à-vis the US\$, and an increase measures an appreciation.

The calculation of the stock of FDI abroad follows the same methodology, and is based on the assumption that the investment pattern of a country reflects its trade pattern. It requires an additional adjustment designed to account for the impact of changes in the exchange rates of the countries where the investment takes place vis-à-vis the US dollar. Suppose, for example, that Italy invests in Germany and that the D-mark appreciates vis-à-vis the US dollar in year t . In this case, the value of the stock of Italian capital in Germany at the end of t will exceed the cumulative US dollar value of investment flows, and the relevant real

exchange rate for the adjustment of past stocks is the real exchange rate of trade partner countries vis-à-vis the US (disregarding trend increases in the prices of capital goods). Hence:

$$FDIA_t = FDIA_{t-1} \frac{rerpc_t}{rerpc_{t-1}} + \Delta FDIA_t$$

$$rerpc = \frac{cpi^{pc} e_s^p}{cpi^{us}}$$
(A4)

where *pc* stands for partner countries, *us* for United States, cpi^x is the consumer price index of country *x* and e_s^{pc} is the dollar/partner countries' nominal exchange rate. The term multiplying the lagged stock $FDIA_{t-1}$ is one plus the change in the purchasing power of the basket of partner country currencies vis-à-vis the US dollar (the measurement unit) between the end of year *t* and the end of *t-1*.

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Table 1. Balance of Payments Components

Current account (78ald): CA
Capital account [balance] (78bcd): ΔKA
Direct Investment abroad (78bdd): $\Delta FDIA$
Direct investment in country (78bed): $\Delta FDIL$
Portfolio Investment Assets (78bfd): $\Delta PA = \Delta PDA + \Delta EQA$
Portfolio Investment Debt Assets (78bld): ΔPDA
Portfolio Investment Equity Assets (78bkd): ΔEQA
Portfolio Investment liabilities (78bgd): $\Delta PL = \Delta PDL + \Delta EQL$
Portfolio Investment debt liabilities (78bnd): ΔPDL
Portfolio investment equity liabilities (78bmd): ΔEQL
Other investment assets (78bhd): ΔOA
Other investment Liabilities (78bid): ΔOL
Financial account (78bjd): $FINA = \Delta FDIA + \Delta FDIL + \Delta PA + \Delta PL + \Delta OA + \Delta OL$
Net Errors and Omissions (78cad): $EO = -(CA + \Delta KA + FINA + RES)$
Reserves and related items (Financing) (79dad): $RES = -\Delta FX + \Delta EF + \Delta IMF$
Reserve assets (79dbd): $-\Delta FX$
Exceptional financing (79ded): ΔEF
Fund Credit and Loans (79dcd): ΔIMF

**Table 2. Changes in Net Foreign Assets and Current Account:
Correlations for Industrial Nations**

	Correlation (<i>CA, dACUMCA</i>)	Correlation (<i>dACUMCA, dIPNFA</i>)	Correlation (<i>CA, dIPNFA</i>)	Observations On IIP
USA	0.53	0.75	0.21	18
UK	0.53	0.61	0.36	28
Austria	0.87	0.30	0.37	18
Denmark	0.29	0.07	0.77	7
France	0.44	0.68	0.53	9
Germany	0.89	0.93	0.94	17
Italy	0.95	0.78	0.77	26
Netherlands	-0.14	0.31	-0.41	15
Norway	0.93	0.94	0.82	5
Sweden	0.66	0.31	0.39	16
Switzerland	-0.63	0.74	-0.50	13
Canada	0.60	0.83	0.65	28
Japan	0.82	0.83	0.86	28
Finland	0.17	0.83	-0.16	23
Greece	0.89	-	-	-
Iceland	0.98	0.64	0.71	10
Ireland	0.99	-	-	-
Portugal	0.98	-	-	2
Spain	0.51	0.90	0.62	17
Australia	0.34	0.92	0.26	12
New Zealand	0.22	0.02	0.06	9

Note: Correlation (*CA, dACUMCA*) is the correlation of current account and first difference of *ACUMCA*, each as a ratio to GDP. Correlation (*dACUMCA, dIPNFA*) is the correlation of first differences of *ACUMCA* and *IPNFA*, each as a ratio to GDP. Correlation (*CA, dIPNFA*) is the correlation of current account and first difference of *IPNFA*, each as a ratio to GDP. All correlations are calculated over the period: for which *IPNFA* is available.

Table 3. Developing Countries: Net External Position as of 1998

Creditors	Debtors (0 to 20%)	Debtors (20 to 40%)	Debtors (40 to 60%)	Debtors (over 60%)
<i>1. ACUMCA</i>				
Botswana	Algeria*	Argentina	Dominican R.	Bolivia
China	Egypt	Brazil	Guatemala	Costa Rica
Kuwait	El Salvador	Chile	Indonesia.	Côte d'Ivoire
Saudi Arabia	Israel	Colombia	Mexico	Ecuador
Singapore	Korea	India	Morocco	Jamaica
South Africa	Oman	Malaysia*	Pakistan*	Jordan
Syria	Turkey	Mauritius	Paraguay	Peru
Taiwan		Panama	Philippines	Sri Lanka
Venezuela		Uruguay	Trinidad and Tob.	Thailand
				Tunisia
				Zimbabwe**
<i>2. ACUMFL</i>				
Botswana	China	Argentina	Algeria	Bolivia
Israel	Korea	Brazil	Chile	Costa Rica
Kuwait	Oman	Colombia*	Dominican R.	Côte d'Ivoire
Singapore	Saudi Arabia	Egypt	Malaysia	Ecuador
South Africa	Venezuela	El Salvador	Mauritius	Indonesia
Taiwan		Guatemala	Mexico	Jamaica
Uruguay		India	Morocco	Jordan
		Paraguay	Pakistan*	Thailand
		Syria	Philippines	Trinidad and Tobago
		Turkey	Sri Lanka	Zimbabwe
			Tunisia	

Note: *ACUMFL*: net FDI+net equity+reserves+debt assets-external debt. * Data for 1997. ** Data for 1994

Table 4. Developing Countries: Current Account and Changes in NFA, 1970-98

Country	Correl ($CA, dACUMCA$)	Correl ($CA, dACUMFL$)	Country	Correl ($CA, dACUMCA$)	Correl ($CA, dACUMFL$)
Algeria	0.94	0.93	Mauritius	0.99	0.71
Argentina	0.44	0.4	Mexico	0.55	0.29
Bolivia	0.52	0.29	Morocco	0.9	0.47
Botswana	0.96	0.83	Oman	0.85	0.79
Brazil	0.78	0.72	Pakistan	0.93	0.34
Chile	0.69	0.63	Panama	0.97	
China	0.88	0.70	Paraguay	0.88	0.81
Colombia	0.94	0.80	Peru	0.71	0.68
Costa Rica	0.58	0.41	Philippines	0.7	0.45
Côte d'Ivoire	0.55	0.43	Saudi Arabia	0.97	0.9
Dominican Rep.	0.6	0.52	Singapore	0.84	0.61
Ecuador	0.84	0.54	South Africa	0.92	
Egypt	0.69	0.50	Sri Lanka	0.94	0.71
El Salvador	0.85	0.49	Syria	0.99	0.67
Guatemala	0.69	0.56	Taiwan	0.97	0.84
India	0.84	0.58	Thailand	0.69	0.61
Indonesia	0.7	0.34	Trinidad&Tobago	0.84	0.69
Israel	0.96	0.19	Tunisia	0.81	0.64
Jamaica	0.39	0.34	Turkey	0.92	0.57
Jordan	0.41	-0.04	Uruguay	0.79	0.44
Korea	0.97	0.86	Venezuela	0.91	0.78
Kuwait	1	0.99	Zimbabwe	0.93	0.75
Malaysia	0.85	0.81			

	Correlation ($CA, dIPNFA$)	Correlation ($dACUMCA, dIPNFA$)	Correlation ($dACUMFL, dIPNFA$)	<i>IPNFA</i> Observations
Colombia	0.78	0.71	0.63	18
Korea	0.92	0.90	0.90	14
Malaysia	0.67		0.65	14
Peru	0.51	0.30	0.40	12
South Africa	-0.02	0.22		11
Venezuela	0.95	0.96	0.93	12

Note: Correlation ($CA, dACUMCA$) is the correlation between the current account and first difference of $ACUMCA$, each expressed as a ratio to GDP. Same for correl ($CA, dACUMFL$), correl ($CA, dIPNFA$) and the other correlations. Period: 1970-98 (or period for which $IPNFA$ is available).

Table 5. Net Foreign Asset Position

	(1)	(2)	(3)	(4)	(5)
Sample →	Full	Full, no oil	Industrial	Developing	Devel, no oil
Open	0.213 (2.93)**	0.227 (3.69)**	0.736 (3.06)**	-0.030 (0.18)	0.137 (1.58)
Size	2.791 (0.45)	8.889 (3.37)**	11.377 (3.37)**	3.704 (0.49)	9.727 (2.28)*
GDP-PC	27.389 (3.34)**	20.895 (3.89)**	31.161 (2.03)	71.461 (2.13)*	34.205 (2.71)**
Observations	66	63	21	45	42
Adj R-sq	0.08	0.29	0.36	0.17	0.25

Note: Robust t-statistics in parentheses. * significant at 5% level; ** significant at 1% level. “No oil” indicates sample excluding Kuwait, Oman and Saudi Arabia

Table 6. Composition of Foreign Assets and Liabilities

Panel A. FDI

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<i>Dep var</i> →	Assets	Liab	Net	Assets	Liab	Net	Assets	Liab	Net
	Full	Full	Full	Ind	Ind	Ind	Devel	Devel	Devel
Open	0.046 (2.48)*	0.162 (4.35)**	-0.116 (2.49)*	0.385 (1.86)	0.058 (0.43)	0.335 (2.28)*	0.054 (9.25)**	0.150 (3.19)**	-0.096 (2.10)*
Size	1.303 (2.22)*	-0.806 (0.53)	2.114 (1.32)	3.342 (1.60)	-0.232 (0.09)	3.619 (1.91)	0.944 (5.24)**	-1.297 (0.69)	2.246 (1.19)
GDP-PC	8.275 (5.49)**	0.702 (0.48)	7.562 (3.86)**	32.668 (3.44)**	-3.499 (0.83)	37.574 (4.04)**	2.257 (3.07)**	3.734 (0.68)	-1.496 (0.26)
Observ	62	63	62	20	21	20	42	42	42
Adj R-sq	0.42	0.30	0.26	0.27	-12	0.38	0.74	0.36	0.22

Note: Robust t-statistics in parentheses; * significant at 5% level; ** significant at 1% level

Panel B. Portfolio Equity

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<i>Dep var</i> →	Assets	Liab	Net	Assets	Liab	Net	Assets	Liab	Net
	Full	Full	Full	Industr	Industr	Industr	Devel	Devel	Devel
Open	0.095 (4.93)**	0.032 (2.82)**	0.060 (2.70)**	0.305 (3.16)**	0.363 (2.59)*	-0.072 (0.83)	0.103 (3.92)**	0.033 (3.54)**	0.069 (3.89)**
Size	1.379 (3.20)**	1.031 (2.40)*	0.199 (0.45)	2.542 (2.48)*	2.678 (2.52)*	-0.664 (0.53)	1.149 (2.95)**	0.961 (4.19)**	0.188 (0.59)
GDP-PC	4.968 (4.13)**	5.372 (3.75)**	-0.266 (0.35)	20.912 (2.54)*	18.009 (1.45)	3.215 (0.57)	1.235 (1.70)	2.020 (3.51)**	-0.785 (1.07)
Observ	61	61	61	19	19	19	42	42	42
Adj R-sq	0.47	0.29	0.27	0.24	0.18	-12	0.74	0.55	0.62

Note: Robust t-statistics in parentheses; * significant at 5% level; ** significant at 1% level

Panel C. Net Debt and Equity/Debt Ratio

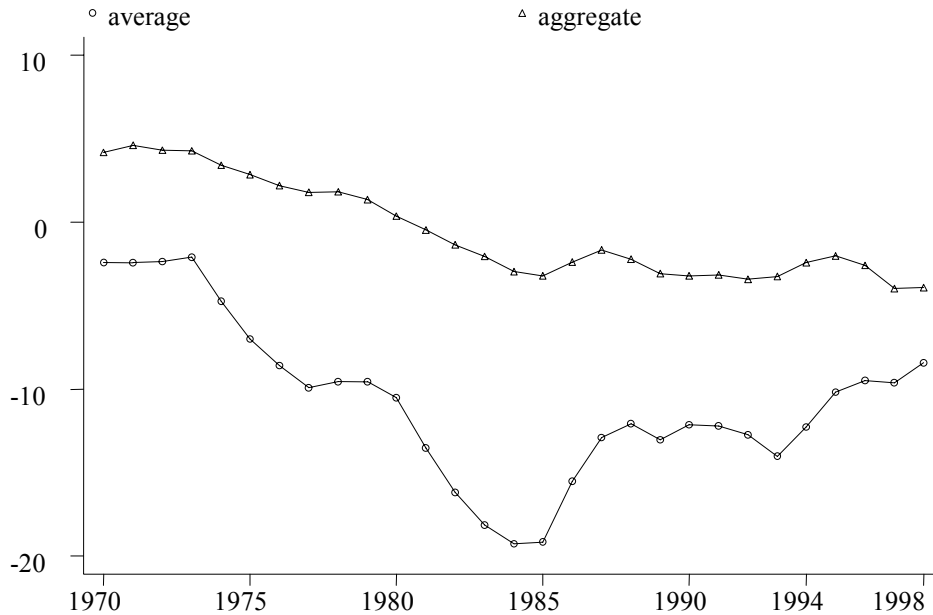
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Dep var</i> →	Net debt full sample	Net debt, industrial	Net debt (CA) Developing	Net debt (CF) Developing	Gross debt developing	Gearing developing
Open	0.281 (4.25)**	0.530 (2.33)*	0.163 (1.86)	0.366 (2.76)**	-0.035 (0.47)	0.021 (4.27)**
Size	6.491 (2.40)*	8.651 (5.08)**	7.302 (1.73)	5.811 (1.12)	-7.529 (2.26)*	0.206 (2.39)*
GDP-PC	13.679 (2.67)**	-12.994 (0.67)	36.610 (3.10)**	31.690 (2.39)*	-23.466 (2.13)*	0.263 (1.42)
Observat	61	19	42	42	42	42
Adj R-sq	0.21	0.23	0.31	0.32	0.12	0.74

Note: Robust t-statistics in parentheses; * significant at 5% level; ** significant at 1% level. Net debt is NFA minus net

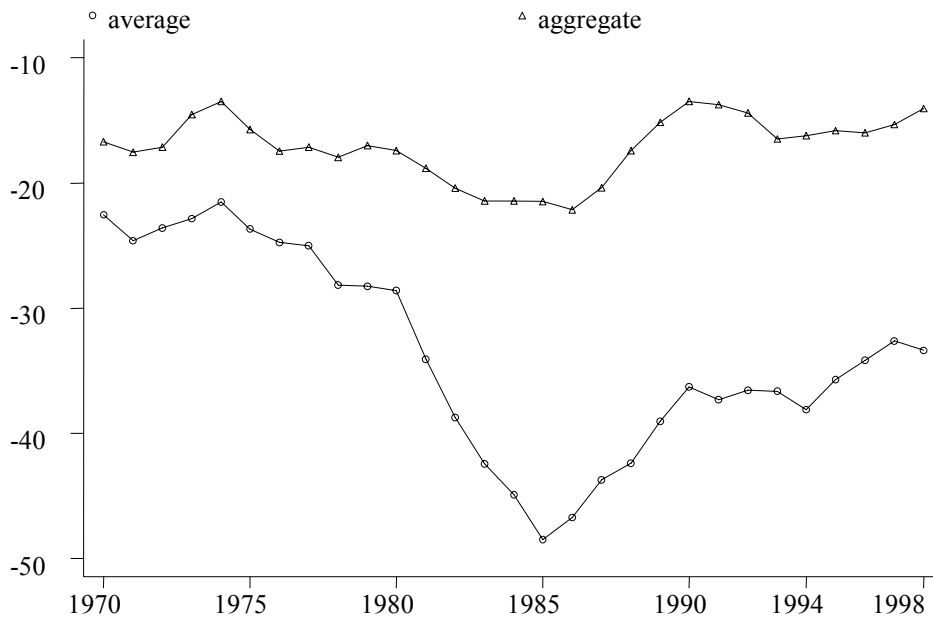
FDI minus net equity (CA= $ACUMCA$ defin, CF= $CUMFL$). Gearing is ratio of FDI+equity liabilities to debt liabilities.

Figure 1. Net Foreign Asset Position*

A. Industrial countries



B. Developing countries**

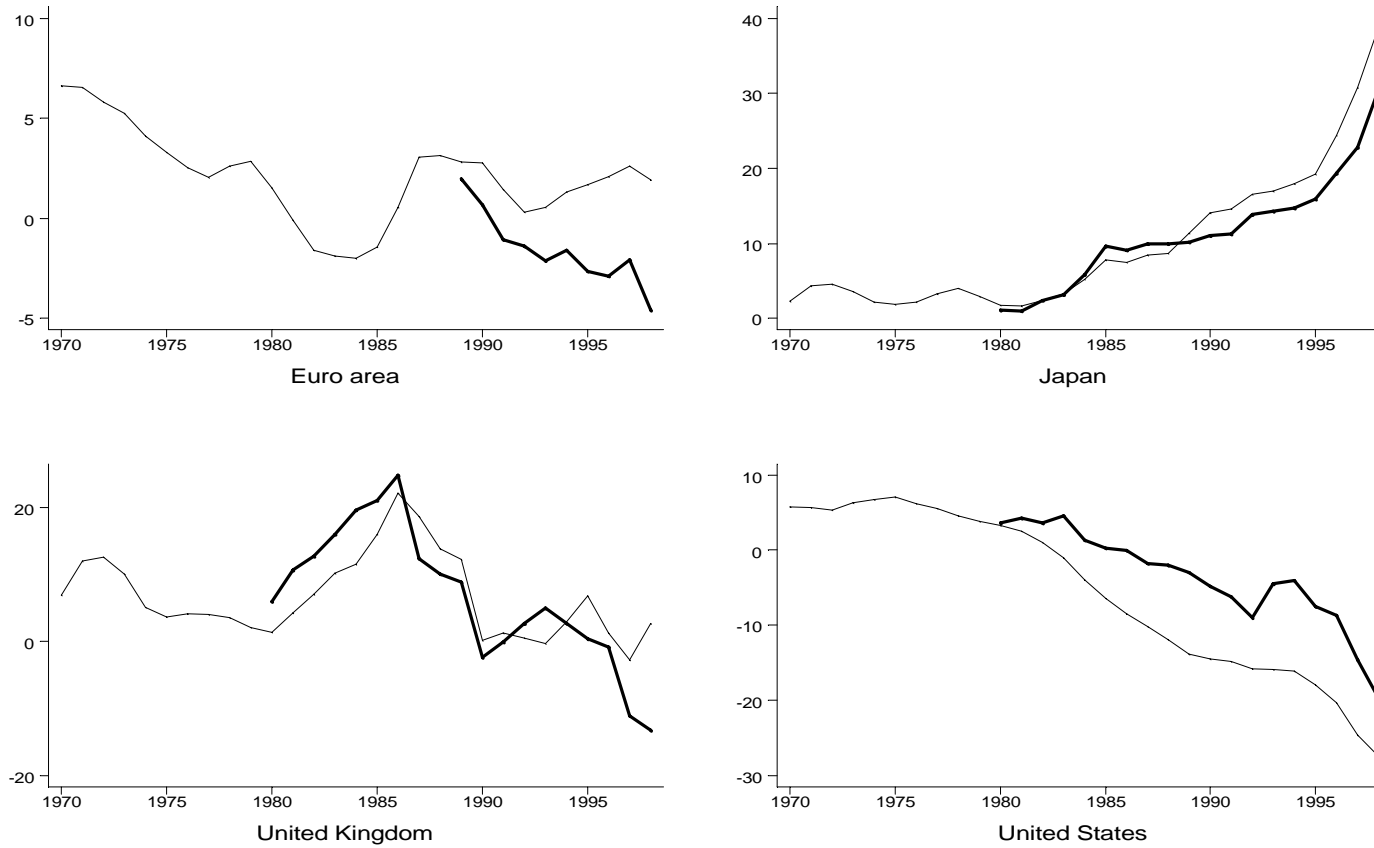


* Aggregate position is the aggregate net foreign asset position ($ACUMCA$) divided by aggregate GDP.

Average is the average ratio of net foreign assets to GDP among the countries in the group.

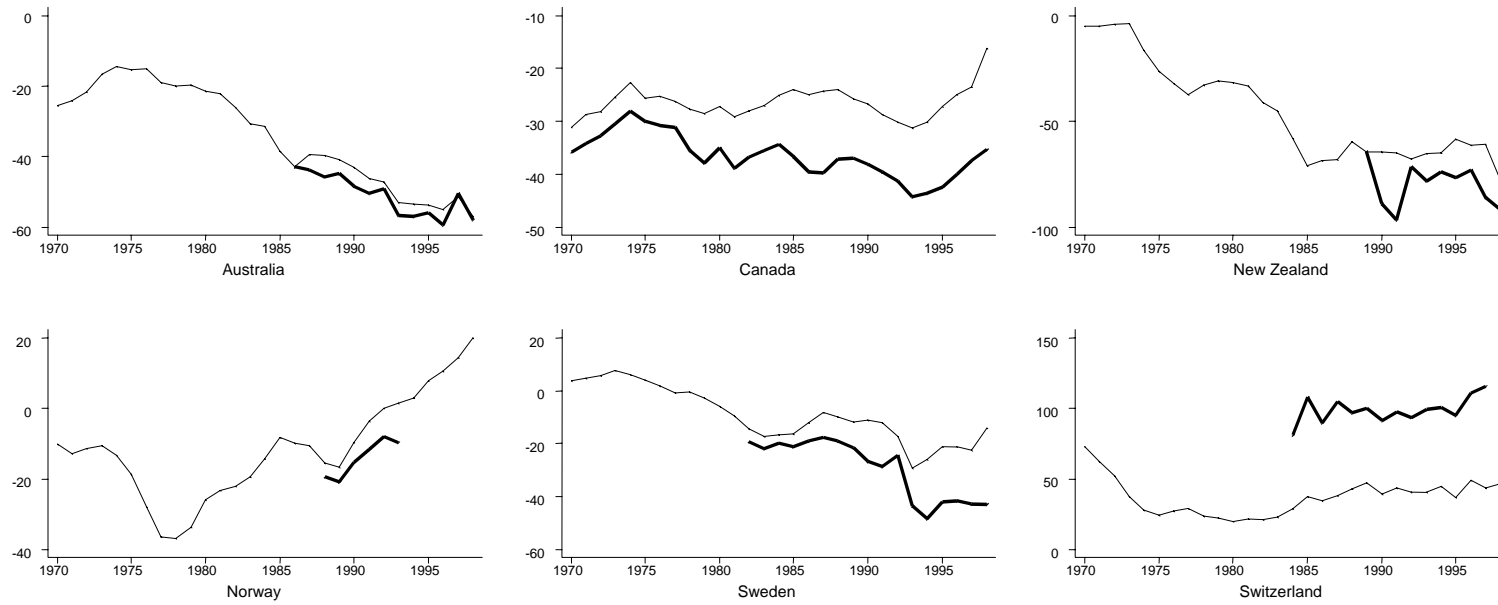
** Excludes Kuwait, Oman, Saudi Arabia and Singapore

Figure 2. Net Foreign Assets, Industrial Countries



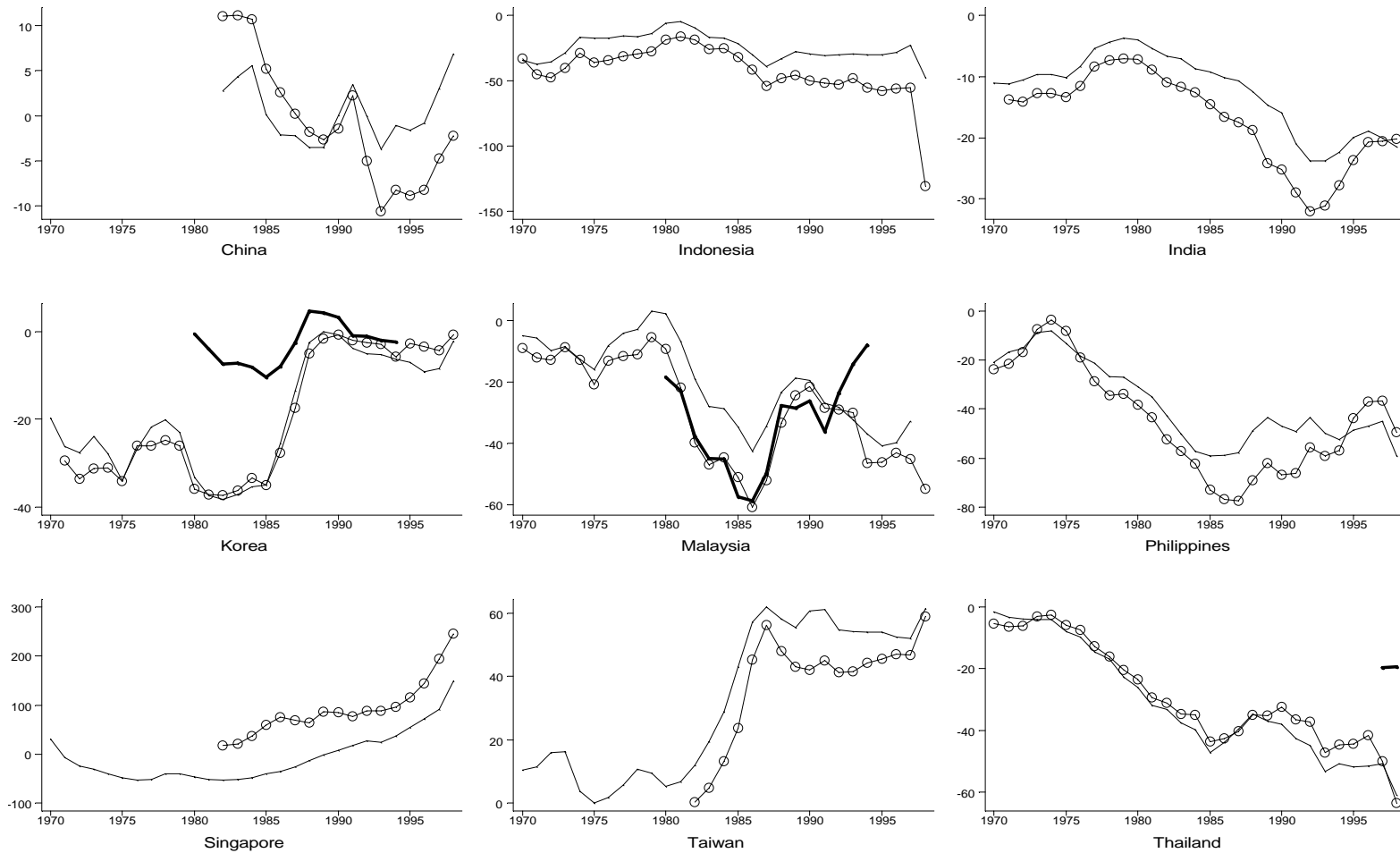
— International investment position (*IPNFA*)
 — Adjusted cumulative current account (*ACUMCA*)

Figure 2 (continued). Net Foreign Assets, Industrial Countries



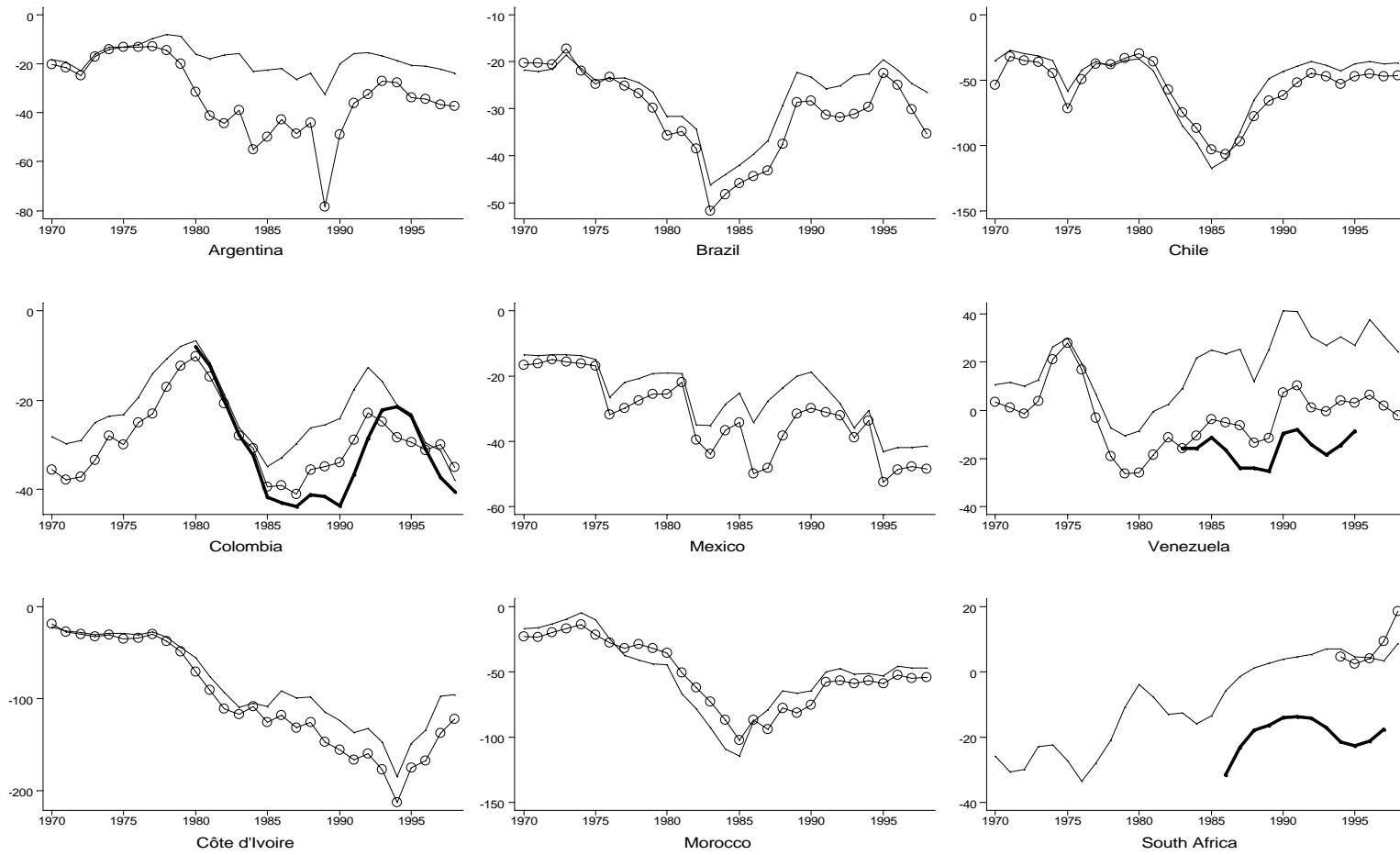
— International investment position (*IPNFA*)
 — Adjusted cumulative current account (*ACUMCA*)

Figure 3. Net Foreign Assets, Developing Countries



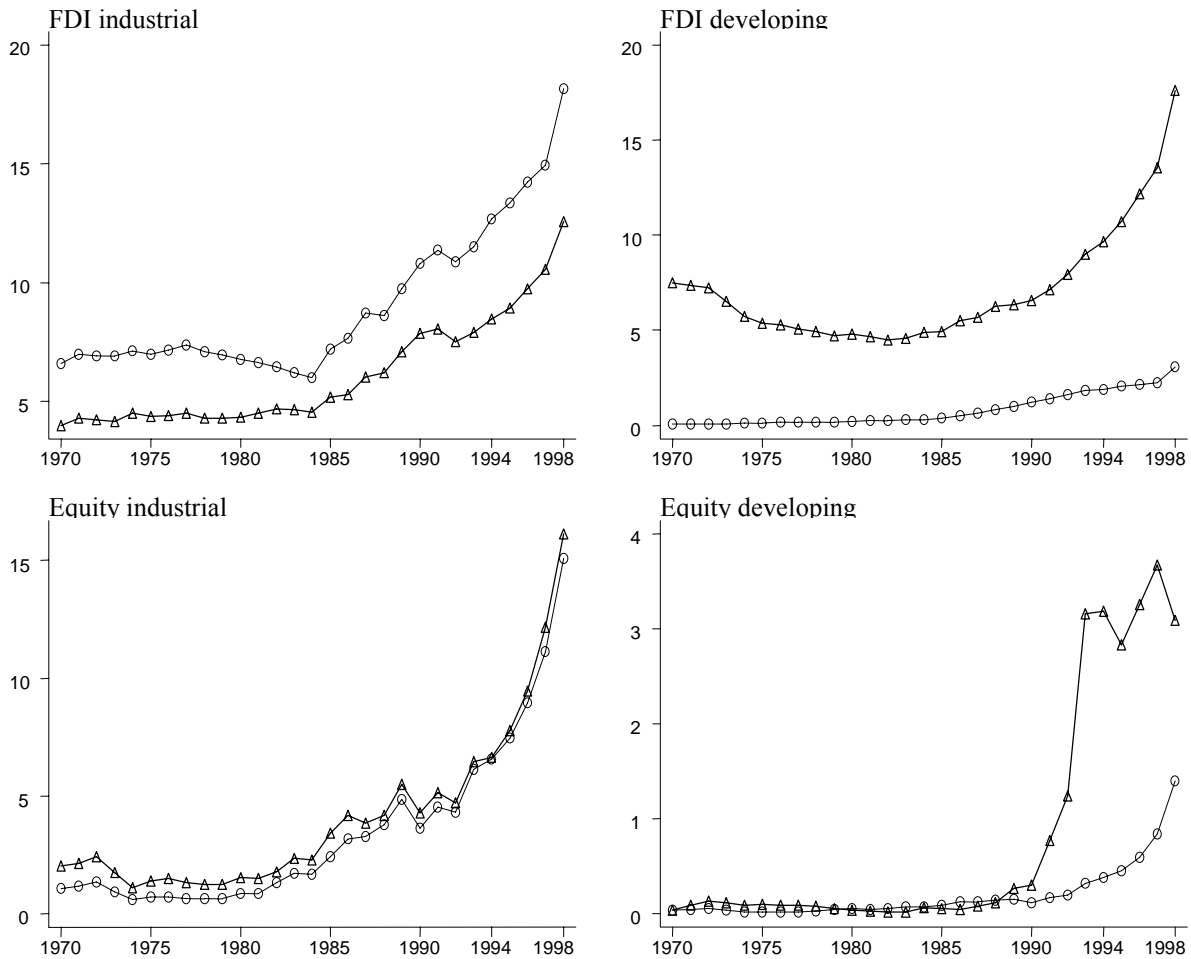
— International investment position (*IPNFA*)
 — Cumulative current account (*ACUMCA*)
 ○—○ Cumulative capital flows (*ACUMFL*)

Figure 3 (continued). Net Foreign Assets, Developing Countries



— International investment position (*IPNFA*)
 — Cumulative current account (*ACUMCA*)
 ○—○ Cumulative capital flows (*ACUMFL*)

Figure 4. Aggregate FDI and portfolio equity stocks, 1970-98
(ratios of GDP)*



O-O-O Aggregate assets
Δ-Δ-Δ Aggregate liabilities

* The developing country sample excludes Kuwait, Oman, Saudi Arabia and Singapore.

¹ Moreover, Sinn concentrates on the decomposition of external position according to ownership (public, private, banks) whereas we focus on the breakdown between equity and debt.

² The implications of the first assumption are discussed later in this section. Committeri (1999) provides evidence for Italy consistent with this assumption. Insofar as *EO* measure the balance between unrecorded capital inflows and outflows, the second assumption implies that all unrecorded capital inflows are reductions in the stock of assets held abroad by domestic residents.

³ Cumulative capital transfers are also very important for Australia, Israel, New Zealand and for major recipients of EU transfers, such as Ireland.

⁴ See the discussion in the Working Paper version of this paper. An alternative methodology, followed by Broner, Loayza and Lopez (1997), is to infer the NFA position based on net income payments data.

⁵ In *IFS* and *BOPS*, debt reduction corresponds to a *reduction in other liabilities ΔOL* (as a debt repayment). This entry is offset within the capital and financial account, leaving unchanged the current account. This offset is sometimes recorded as an inward transfer in the capital account (*ΔKA*), in which case it is important to take into account the amount of debt forgiveness already included in the capital account, so as to avoid double-counting. The most common way to offset the reduction in external liabilities due to debt reduction is through exceptional financing (*ΔEF*), which leaves the change in indebtedness *$\Delta DEBTL$* unaffected. In this latter case, *ACUMCA* should be adjusted by the full amount of capital account and debt forgiveness operations.

⁶ Data on the stocks of FDI and equity holdings are available for a few countries from the IMF's IIP data. The OECD also publishes stocks of FDI for most industrial countries. Finally, the UN Centre for Transnational Corporations publishes data on the flows and stocks of FDI (see Section III).

⁷ As initial values for debt assets, we use Sinn's estimates until the year for which capital flow data becomes available. Debt assets could also be estimated using data of the Bank for International Settlements on deposits in member banks by residents of that country. This provides a useful robustness check on our estimates (see Sections IV and V), even though the data are provided only by banks whose country reports to the BIS.

⁸ 'Industrial' countries include the United States, United Kingdom, Austria, Belgium-Luxembourg, Denmark, France, Germany, Italy, Netherlands, Norway, Sweden, Switzerland, Canada, Japan, Finland, Greece, Iceland, Ireland, Portugal,

Spain, Australia and New Zealand. ‘Developing’ countries are Turkey, South Africa, Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Mexico, Panama, Paraguay, Peru, Uruguay, Venezuela, Jamaica, Trinidad and Tobago, Israel, Jordan, Kuwait, Oman, Saudi Arabia, Syrian Republic, Egypt, Sri Lanka, Taiwan, India, Indonesia, Korea, Malaysia, Pakistan, Philippines, Singapore, Thailand, Algeria, Botswana, Côte d'Ivoire, Mauritius, Morocco, Zimbabwe, Tunisia, and China.

⁹ See Cohen (1991) for an early analysis of external solvency in transition economies.

¹⁰ Among countries with population below 1 million, we include Iceland, and among those with GDP per capita below the threshold, China, India, Pakistan and Zimbabwe. Hong Kong and Iran were excluded because of data problems. For most poorer countries, equity flows are less important and problems of data availability and quality more severe. Nevertheless, our methodology can be extended to a larger sample.

¹¹ Notable exceptions are Brazil, for which debt reported by the World Bank is much higher than reported by the OECD, and Korea, for which the opposite is true. In Brazil, domestic residents hold part of foreign currency debt; in Korea, some domestic currency debt is held by foreigners. We used OECD data for Israel, Kuwait, Saudi Arabia, Singapore and Taiwan, since they are not included in the World Bank debt database.

¹² This stock estimate is in general higher than the cumulative flow up to 1967. The United Nations Centre on Transnational Corporations also provides measures of the stock of inward and outward FDI. For most countries, the data are similar to those we obtained by our cumulative flow method.

¹³ IMF (1999) contains detailed data on portfolio investment assets at end-1997 for 29 countries.

¹⁴ The exclusion of Arab peninsula oil producers and Singapore alters the level but not the time series behavior of aggregate and average NFA.

¹⁵ For Canada, the discrepancy is mainly due to Canadian holdings of foreign equities, whose reported stock value has risen much more slowly than the adjusted cumulative flow. For Switzerland, the balance of payments data does not report any flow of equity or FDI prior to 1983 even though the estimated stock reported for 1984 is large. Furthermore, the size of cumulative errors and omissions is substantial.

¹⁶ Jordan is also one of the countries for which measures of external assets differ most significantly: if the assets held by Jordanian residents in BIS-reporting banks were used instead of cumulative outflows, the country's NFA position would improve dramatically, with net liabilities of around 10 percent of GDP in 1997.

¹⁷ Belgium is excluded from the sample since the balance of payments data refer to Belgium-Luxembourg jointly and the data for Luxembourg are unreliable. A significantly positive relation between openness and FDI liabilities holds for industrial countries if IIP data for Belgium are added to the sample.

¹⁸ Monthly data are available from Morgan Stanley at <http://www.msdata.com>. For the US, the UK and Japan we adjust the stock of equity held abroad by a composite index of world stock markets that excludes the 'source' country. For all other countries the mismeasurement due to the inclusion of the source country is likely to be small, given relative weights and the co-movement in stock market values over the long run.