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**The External Wealth of Nations:  
Measures of Foreign Assets and Liabilities for Industrial and Developing Countries**

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**Abstract**

Capital flows are closely monitored, but surprisingly little is known about the stocks of external assets and liabilities held by countries, especially in the developing world. This paper constructs estimates of foreign assets and liabilities and their equity and debt subcomponents for 66 industrial and developing countries for the period 1970-97. It explores the sensitivity of estimates of stock positions to the treatment of valuation effects not captured in balance of payments data. Finally, it characterizes the stylized facts of estimated stocks and asks whether there are trends in net foreign asset positions and differences in debt-equity ratios across countries.

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## I. INTRODUCTION

The integration of world capital markets is perhaps the 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, since the *level* of net foreign assets is a key state variable in many open-economy models of growth and business cycles. In addition, much could be learned by examining the *composition* of international investment positions: for instance, an interesting hypothesis is that a country with a low debt-equity ratio in the composition of its external liabilities may be better able to withstand shocks than one with higher gearing.

In order to address such questions, the goal of this paper is to obtain a better sense of the true international investment positions of countries by constructing estimates of foreign assets and liabilities and their subcomponents for 66 countries for the period 1970-1997, using balance of payments data. We also explore the sensitivity of estimates of stock positions to 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 debt-equity ratios over time.

The estimates are based on existing stock measures, when available, supplemented by the cumulation of capital flows, with appropriate valuation adjustments. Data on countries' international investment position have been published by the International Monetary Fund in recent years for most industrial countries and a few developing countries, with coverage typically starting in the 1980s. For those countries, the paper provides a longer time series for assets and liabilities, based on (adjusted) cumulative flow data. A comparison of the measures we construct with those already existing 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 gross external debt and foreign exchange reserves. An additional contribution of the paper consists in the construction of stock measures for equity and foreign direct investment based on flow data that are adjusted to reflect, albeit crudely, the effect of changes in market prices and exchange rates (in addition to the basic data constructed by cumulating the flows at "historical" prices).

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 stocks of assets and liabilities, as well as the impact of factors such as unrecorded capital flight, exchange rate fluctuations, debt reduction schemes and other valuation changes that are not captured in a "crude" cumulative current account balance.

The most direct precursors of our work are Sinn (1990) and Rider (1994).<sup>2</sup> Sinn (1990) constructs detailed measures of foreign assets and liabilities for 145 countries, using balance of payments data from the IMF, supplemented with data from national sources and from the United Nations. This is by far the most comprehensive study undertaken on this subject; however, it covers the period 1970-87, and therefore misses the large increase in the volume of international capital flows as well as the changes in their composition that took place over the last decade. Rider (1994) undertakes a similar exercise for the period 1984-93, focusing mostly on industrial countries. Our work is also linked to the extensive literature on the capital flight (see, for example, Cuddington (1986); Dooley (1986, 1988) and the good methodological survey in Claessens (1997)). Indeed, methods proposed in this literature are used to supplement our measures of external assets held by developing country residents.

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 link between GDP per capita and net external position is weaker; however, richer countries tend to have more FDI assets and lower FDI liabilities. We view these preliminary results as a promising start for an investigation of the causes and effects of countries' external wealth.

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 stock measures for all external assets and liabilities on the RHS of (1), using data on the current account and capital flows, as reported in balance of payments statistics.

The convention in balance-of-payments accounting is for capital inflows to have a positive sign and capital outflows a negative sign. Table 1 lists the various components of the balance

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<sup>2</sup> See also Kennedy (1980) for estimates of net foreign assets of several countries in 1975.

Table 1. Balance of Payments

Current account (78ald):	$CA$
Capital account [balance] (78bcd):	$\Delta KA$
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):	$\Delta PDA$
Portfolio Investment Equity Assets (78bkd):	$\Delta EQA$
Portfolio Investment liabilities (78bgd):	$\Delta PL = \Delta PDL + \Delta EQL$
Portfolio Investment debt liabilities (78bnd):	$\Delta PDL$
Portfolio investment equity liabilities (78bmd):	$\Delta EQL$
Other investment assets (78bhd):	$\Delta OA$
Other investment Liabilities (78bid):	$\Delta OL$
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):	$\Delta EF$
Fund Credit and Loans (79dcd):	$\Delta IMF$

of payments according to the IMF's Balance of Payments Manual 5; we have defined flows as changes in the corresponding stocks. In recent years, the balance of payments data in the IMF's Balance of Payments Statistics are supplemented by 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 time period of 15 years. The aim of our analysis is to provide IIP estimates also for countries/time periods for which stock data are not available.

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 is a category that includes arrears on payments of principal and interest 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. Note also that in the IFS classification both exceptional financing and IMF loans are recorded "below the line", as a financing item rather than as accumulation of an external liability. In our analysis, both are considered as sources of changes in the stock of external indebtedness. We initially focus on the link between the cumulative current account, the various components of the capital account and a country's net external position, assuming that capital flows are measured correctly and that flows equal the change in the corresponding stock. We then discuss the impact of valuation changes and mismeasurement of capital flows on our estimates of external assets and liabilities.

We group the various components of the capital and financial account in distinct categories. An important issue to address is the treatment of "net errors and omissions" (*EO*). This item reflects (net) unrecorded transactions, that could reflect mismeasurement of the current account, the financial account or both. If it reflects unrecorded trade transactions, we should add this item to the current account. 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 assets held abroad by domestic residents.<sup>3</sup> Hence, a country's accumulation of external "non-equity assets" can occur through portfolio debt assets, other assets or errors and omissions, in addition to foreign exchange reserves. Accumulation of debt can instead occur through other liabilities, portfolio debt liabilities, borrowing from the IMF or "exceptional financing."

Let  $A$  and  $L$  indicate assets (outflows) and liabilities (inflows), respectively. Then

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<sup>3</sup> We discuss the implications of the first assumption later in this section. Insofar as net errors and omissions are the balance between unrecorded capital inflows and unrecorded capital outflows, the second assumption made here implies that all unrecorded capital inflows are attributed to reductions in the stock of assets held abroad by domestic residents. We relax this second assumption and discuss this issue more in detail in Section II.C.

$$\begin{aligned}
 \Delta FDI &= -(\Delta FDI_A + \Delta FDI_L) \\
 \Delta EQ &= -(\Delta EQ_A + \Delta EQ_L) \\
 \Delta DEBTL &= \Delta PDL + \Delta OIL + \Delta IMF + \Delta EF \\
 \Delta DEBTA &= -(\Delta PDA + \Delta OA + EO)
 \end{aligned} \tag{2}$$

where  $\Delta FDI$  is net outflows of foreign direct investment,  $\Delta EQ$  is net portfolio investment and  $\Delta DEBTL$  and  $\Delta DEBTA$  are the change in debt liabilities and assets, respectively. From the above definitions and from those in Table 1 one obtains:

$$CA = \Delta EQ + \Delta FDI + \Delta DEBTA - \Delta DEBTL - \Delta KA + \Delta FX \tag{3}$$

The cumulative value of the current account is equal to the cumulative value of the various terms on the RHS of (3). Disregarding for the time being valuation changes and price effects, various types of capital flows can be viewed as changes in the corresponding stocks. Suppose that we have data starting in period  $s$  and want to obtain measures of external assets and liabilities between the years  $p > s$  and  $T$ . We can then cumulate equation (3) as follows:

$$CUMCA_s(t) = \sum_s^t CA_t = DEBTA_s(t) - DEBTL_s(t) + EQ_s(t) + FDI_s(t) + FX_s(t) - KA_s(t) \tag{4}$$

$t = p, p+1, \dots T$

where  $X_s(t)$  is the cumulative value of  $\Delta X$  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

Measuring net foreign assets of a country with cumulative flows requires some assumption about their initial value. If the period between  $s$  and  $p$  is sufficiently long and/or initial external assets and liabilities are negligible, cumulative flows provide a reasonable estimate of the underlying net foreign asset position ( $NFA$ ) given by equation (1):

$$NFA \approx CUMCA + KA \tag{5}$$

(remember that the capital account balance reflects primarily net capital transfers, rather than increases in indebtedness). Adjusting the current account for the capital account balance is quantitatively important for several countries: for example, cumulative capital transfers to Israel account for almost 14 percent of 1997 Israeli GDP. Cumulative capital transfer inflows are also very large in countries like Canada (over 10 percent of 1997 GDP), Australia and New Zealand, possibly reflecting immigration of wealthy individuals.<sup>4</sup> Note also that if errors and omissions reflect unrecorded trade transactions, instead of financial account

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<sup>4</sup> Major recipients of EU transfers, such as Ireland, have also benefited from significant capital transfers in recent years.



transactions, we should adjust the current account by the cumulative value of errors and omissions as well.

Relatively long time series for the current account (often starting in the 1950s) and for FDI flows are available. However, consistent data for other capital flows start only in the mid-seventies, because of the change in the methodology for recording balance of payments transactions. For some flows, such as equity, the problem is minor for most countries, given that those flows were negligible until recently. For others, such as foreign exchange reserves and, for developing countries, gross external debt and, in some cases, inward foreign direct investment, we can instead rely on direct stock measures as initial values. We lack, however, direct measures of the initial assets held by a country's residents overseas. For developing countries the approach we followed was to take the cumulative current account (with some adjustments, discussed further below) as an accurate initial value of the net foreign asset position, and to estimate the initial debt asset position of the country residually (see Appendix I). An alternative methodology would have consisted in trying to infer the net foreign asset position of the country based on information on net income payments (for such an approach see, for example, Broner, Loayza and Lopez (1997)). The estimated NFA would then have yielded residually the initial stock of foreign asset holdings.

## **B. How to Account for Debt Reduction and Forgiveness**

If a country's external debt is reduced because of debt forgiveness or because a restructuring deal has reduced the face value of debt, the cumulative current account will, *ceteris paribus*, overstate the size of the country's liabilities. This happens because the reduction in debt liabilities is not reflected in the current account balance. The effects can be very substantial: for example, failing to account for debt forgiveness would lead to overstate Chile's external liabilities in 1989-90 by over 30 percent of GDP. There are two ways to address this issue: one is to adjust capital flows and the other to adjust stocks.

### **Adjustment to flows**

In balance of payments statistics, debt reduction and forgiveness correspond to a *reduction in other liabilities* ( $\Delta OL$ ), equivalent to a capital outflow. This reduction is "offset" within the capital and financial account, so that there is no impact on the current account. This offset can be recorded as an inward transfer in the capital account ( $\Delta KA$ ). This, together with the fact that the capital account also records other transfers, such as migrants' remittances, calls for adjusting the cumulative current account by the amount of the cumulative capital account. However, the most common way to offset the reduction in external liabilities due to debt reduction agreements in IFS statistics is through exceptional financing ( $\Delta EF$ ), so that the reported change in indebtedness  $\Delta DEBTL$  is unaffected. For example, this was the case for Egypt in 1990 (debt forgiveness of over \$10 billion), and for Mexico in 1988. This would

imply that the cumulative capital account balance and the part of exceptional financing related to debt reduction should be excluded from external liabilities.<sup>5</sup>

### **Adjustment to stocks**

Under the heading “debt reduction and forgiveness”, the World Bank reports the total amount of debt reduction, excluding debt-equity swaps, as well as debt forgiven. In the paper, we choose this accounting method and adjust the cumulative current account so as to reflect the impact of debt reduction and forgiveness.<sup>6</sup> It is important to adjust the cumulative current account, rather than just using estimates for the individual stocks because reliable estimates of all the stocks on the RHS of (4) are often not available, and the adjusted cumulative current account is therefore the most accurate proxy for the country’s net external position.

### **C. Valuation Issues**

Price and exchange rate changes have an impact on the stocks of external assets and liabilities that are not captured in the corresponding flows. For debt assets and liabilities, valuation changes are primarily due to exchange rate fluctuations. For example, Indonesia, has had a significant fraction of debt denominated in yen over the past ten years. The yen’s appreciation vis-à-vis the US dollar during the period 1990-1995 implied a significant increase in the dollar value of external debt, while the yen’s subsequent depreciation in 1995-97 had the opposite effect. A similar argument holds for foreign exchange reserves. When stock data are available (as is the case, for example, with gross external debt for developing countries and with foreign exchange reserves for all countries) we can simply substitute in equation (4) the actual value of the stock for the cumulative flow implicit in CUMCA. The impact of valuation changes on gross external debt is obtained from World Bank data, while the impact on reserves is obtained by adjusting the yearly current account for the difference between the change in the stock of reserves and the corresponding flow measured in the balance of payments statistics. These measures are used to ‘correct’ the cumulative current account. Valuation issues are more complex for equity and FDI. The problem here is the lack of data on stocks (similar to

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<sup>5</sup> An inward transfer on the capital account or a positive amount of exceptional financing enter with a positive sign in BOP accounting: hence netting (part of) these items out will improve the country’s measured NFA position. The problem with adjusting the cumulative current account by the entire amount of exceptional financing or capital account balance is that not all these transactions reflect transfers related to debt reduction or forgiveness.

<sup>6</sup> We need to take into account the amount of debt forgiveness already included in the capital account, so as to avoid double-counting.

those on gross external debt) that are comparable across countries.<sup>7</sup> In addition, the value of these assets can be calculated using different methods, as discussed in detail (for the case of FDI) by Pratten (1992) with regard to the United Kingdom, and by Eisner and Pieper (1990, 1991) with regard to the United States. A first method, historical cost, consists in the simple cumulation of flows measured in US dollars. A second method consists in estimating "book value," adjusting the stocks for the effects of exchange-rate changes on historical values. A third method consists in estimating replacement cost, taking into account the effect of inflation on the cost of replacing existing assets/liabilities. Finally, a fourth method consists in estimating market value, adjusting the value of stocks outstanding to reflect their current market value. Rider (1994) highlights that countries differ across these alternative methods when calculating stock values of foreign assets and liabilities.

For the purpose of this paper we estimated stocks of FDI by cumulating dollar flows, with no adjustment (historical values), adjusting stocks for exchange rate changes (book values) and adjusting stocks for increases in the price of capital goods (replacement cost). Appendix III describes more in detail the nature of these adjustments. In constructing the net foreign asset position of countries, we have chosen the "book value" adjustment, which seems to track available stock measures of direct investment more accurately than other methods.

In order to estimate equity stocks from flows, we rely on two alternative methods. The first consists in the simple cumulation of dollar flows with no valuation adjustment. The second consists in cumulating flows adjusting outstanding stocks for changes in stock market values. For inward equity flows, stocks are adjusted for changes in the end-year dollar value of the domestic stock market; for outward equity flows, stocks are adjusted analogously by an index representative of a "world" portfolio, the Morgan Stanley Capital Index (see Appendix III for a more detailed discussion). For the construction of net foreign asset positions, we have used the cumulative flow "adjusted" for variations in stock market values. Stocks estimated with this method accurately track the available direct stock measures for most countries.

#### **D. Mismeasurement of Gross Capital Flows**

For developing countries direct stock measures of debt liabilities, such as gross external debt from the World Bank Global Development Finance Database (*DWB*), are available and can be used instead of the cumulative flow *DEBTL*. This changes the estimate of the net external position in (4)-(5) by  $DWB_T - DWB_{s-1} - DEBTL_s(T)$ . In practice, this difference is substantial for a number of developing countries, even after controlling for the impact of cross-currency fluctuations. In most cases,  $DEBTL_s(T) < DWB(T) - DWB(s-1)$ : for example, the difference in 1994 is over 20 percent of GDP for Turkey and over 10 percent for Argentina. Assuming that stocks are measured correctly, this discrepancy implies that the inflows reported in the balance

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<sup>7</sup> Data on the stocks of FDI and equity holdings are available for a few countries through the IMF's International Investment Position. The OECD also publishes stocks of FDI for most industrial countries. Finally, the UN Centre for Transnational Corporations also publishes data on the flows and stocks of FDI (see Section III).

of payments statistics underestimate actual capital inflows. If we believe that the current account is measured correctly, changes in indebtedness can exceed the recorded flow of new external liabilities by an amount which is equivalent to unrecorded capital outflows (over and above net errors and omissions). The large literature on measuring capital flight deals explicitly with this question (see, for example, Cuddington (1986), Dooley (1986, 1988) and especially Claessens (1997)). We limit ourselves to a short discussion of this issue, referring the interested reader to the papers cited above for a detailed treatment.

To clarify the problem and its impact on the interpretation of the data, suppose that residents of a country hold two types of foreign assets: "recorded" assets  $A$ , which include for simplicity net errors and omissions, and "unrecorded" assets  $KF$ . The entire stock of external liabilities,  $DWB$ , is instead recorded. For simplicity, suppose that reserves, FDI and equity flows are all zero, and that all foreign assets and liabilities earn the world rate of interest  $i^*$ . The correctly measured balance-of-payments identity would be:

$$\hat{CA}_t = TB_t + i^* (A_{t-1} + KF_{t-1} - DWB_{t-1}) = \Delta A_t + \Delta KF_t - \Delta DWB_t \quad (6)$$

However, the flow change and interest earnings on  $KF$  are not recorded in the balance of payments, and the imputed flow of new external indebtedness  $\Delta D$  correspondingly underestimates the change in the debt stock by the same amount, so that:<sup>8</sup>

$$CA_t = TB_t + i^* (A_{t-1} - DWB_{t-1}) = \Delta A_t - \Delta DEBTL_t \quad (7)$$

Incidentally, this means that the measured current account deficit is larger (or the surplus smaller) than the actual one, because interest accruing on  $KF$  is not recorded. The stocks evolve according to the following equations:

$$\begin{aligned} A_t &= A_{t-1} + \Delta A_t \\ DWB_t &= DWB_{t-1} + \Delta DEBTL_t + \Delta KF'_t \\ KF_t &= KF_{t-1} (1 + i^*) + \Delta KF'_t \end{aligned} \quad (8)$$

where  $\Delta KF' = \Delta KF - i^* KF$  is the unrecorded flow of capital out of the country on a "cash" basis, and  $\Delta KF$  on an accrual basis. Hence, the difference  $DWB - DEBTL$  (where the latter is the cumulative sum of  $\Delta DEBTL$ ) is a measure of the stock of unrecorded foreign assets

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<sup>8</sup> The outflows measured by  $\Delta KF$  are over and above the (unrecorded) outflows that are reported as "errors and omissions" in the balance of payments. Holding fixed the measured current account, unrecorded capital outflows must be exactly balanced by unrecorded capital inflows. Hence the measured debt inflow understates the true accumulation of external debt.

held by domestic residents.<sup>9</sup> Hence, equation (8), adjusted to take into account the effect of valuation changes on debt could be used to infer  $\Delta KF'$ . In this case, the adjusted cumulative current account would be an appropriate measure of net foreign assets (disregarding the cumulative value of unrecorded interest earnings), while cumulative capital inflows and outflows underestimate the true underlying stocks.

In order to address this potential mismeasurement of debt flows we proceed as follows. For *debt liabilities*, we use the debt stock data as reported by the World Bank, rather than a cumulative flow measure. For *debt assets*, we estimate them residually as the difference between the adjusted cumulative current account and the sum of the stock of reserves, the net FDI and equity position and the external debt published by the World Bank. This yields  $A+KF'$ , a measure which includes the cumulative recorded outflows as well as the difference between the stock of debt and the cumulative flow of debt liabilities, which we have argued is a proxy for the stock of unrecorded foreign assets held by domestic residents. However, it does not include the accrued interest on these assets that is not recorded in the current account. We also use a second measure of debt assets, the cumulative value of recorded flows (including errors and omissions for those years in which they show net outflows<sup>10</sup>) which is  $A$  and thus excludes most unrecorded debt assets held abroad by residents.

A third possible way to measure the stock of debt assets of a country that has suffered capital flight is to use data of the Bank for International Settlements on deposits in member banks by residents of that country. This source cannot provide a complete picture of foreign asset holdings of a country's residents because it contains only data provided by banks whose country reports to the BIS, but it still is a useful supplement to cumulative flow data. In the empirical sections we shall discuss how this measure compares with the two previous ones.

### III. THE DATA

This Section summarizes data sources and measurement issues. 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 and the Bank for International Settlements' data on banks' assets and liabilities by creditor and debtor (BIS). We have also compared our data with Sinn (1990), Rider (1994) and the net foreign assets for the US, Japan and Germany reported in Masson et al. (1994). Our sample is divided into "industrial" and "developing" countries (see Appendix I for a list). The distinction is to some

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<sup>9</sup> It is possible that capital flight involves "transactions costs" that could partially offset interest earnings, so that the stock of foreign assets is closer to  $KF_t = KF_{t-1} + \Delta KF'$ .

<sup>10</sup> We consider that when  $EO$  show a net inflow this represents an increase in the stock of external liabilities which is captured by external debt data. Insofar as some net inflows reflect repatriation of external assets, our measure will overestimate the debt assets of the country.

degree arbitrary: Singapore, for example, is classified as a developing country but has income per capita which is higher than in most industrial countries. Our sample does not include transition economies and developing countries with per capita income below \$1500 in 1985 (according to Summers and Heston) or population below 1 million.<sup>11</sup>

Several industrial countries and a few developing countries report data on their net foreign asset position and its composition; these data are published in BOPS and IFS as International Investment Position (IIP). When these data are available, we have made use of it. When these data are not available, we have used a variety of other sources.

### **Foreign exchange reserves**

For all countries, we have used IMF data on foreign exchange reserves minus gold (IFS, line 1d.d). We also have measures of gold holdings, evaluated both at historical and market prices, but we have not included them in the net external position, since they do not constitute a liability of another country. We have therefore subtracted the reported value of gold holdings from the International Investment Position.

### **Debt liabilities**

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 flow of other liabilities, portfolio debt and exceptional financing plus the stock of IMF debt (eq. (2)), or 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 debt stocks, we have primarily made use of World Bank data because it is available on a consistent basis for a longer time period (1970-97). The two measures are quite similar, with some exceptions.<sup>12</sup>

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<sup>11</sup> 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 S.A.R., Iran and Panama were excluded because of data problems. For most poorer countries, equity and FDI flows are on average less important and problems of data availability and quality more severe. Nevertheless, our methodology could readily be extended to a larger sample of countries.

<sup>12</sup> Notable exceptions are Brazil, for which debt reported by the World Bank is much higher than the one reported by the OECD, and Korea, for which the opposite is true. In Brazil, a proportion of foreign currency debt is held by domestic residents; in Korea, some domestic currency debt is held by foreigners.

## **Debt assets**

The only stock measures available are those reported in IIP. We also consider the two estimates discussed in Section II.D. The first relies on the cumulative value of flows (see eq.(4), with or without an adjustment for the initial value (see Appendix II). The second, “residual” measure is obtained for developing countries by taking the cumulative current account (corrected for capital account flows, debt reduction and valuation effects) as the appropriate measure of net foreign assets and calculating the stock of 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 the cases in which results differ significantly from those obtained using other definitions.

## **Equity assets and liabilities**

The only direct stock measures available are those reported in the IIP. 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 III for a more detailed explanation). We use this second measure in the remainder of the paper.

## **Foreign direct investment assets and liabilities**

In addition to stock data reported directly in the IIP, we have stocks of FDI assets and liabilities for most countries belonging to the OECD, published in the International Direct Investment Statistics Yearbook, 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 flow data, using BOPS as a source for the flows. For most countries we were able to obtain flow data starting in the early 1960s and for some even earlier. For most developing countries, we use as an initial value for inward FDI the stock of industrial countries’ investment in those countries in 1967 as reported by an OECD study (1972).<sup>13</sup> Flows are used to construct several series, with different methods of valuation adjustment (see Appendix III). In the paper we present the results obtained using an adjustment for relative price changes reflecting exchange-rate fluctuations.

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<sup>13</sup> This stock estimate is in general higher than the cumulative flow up to 1967. For several developing countries, we also have measures of the stock of inward and outward FDI calculated by the United Nations Centre on Transnational Corporations. For most countries, the data are similar to those we obtained by our cumulative flow method. Sinn (1990) makes use of these data for the 1970s in his NFA estimates.

## **Net external asset position**

We consider three alternative measures of the net foreign external asset position: (i) CUMCA: the cumulated current account, adjusted to reflect the impact of capital transfers, valuation changes, capital gains and losses on equity and FDI holdings and debt reduction and forgiveness; (ii) IPNFA: the net external asset positions reported in the International Investment Position section of *BOPS* and *IFS*, net of gold holdings;<sup>14</sup> (iii) NFA, 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). CUMCA is available for both industrial and developing countries, for the period 1970-1997. IPNFA is available for industrial countries and a few developing countries, typically from or after 1980. Finally, NFA is available for developing countries, typically for the period 1970-97.

## **IV. NET FOREIGN ASSET POSITION**

This Section presents the data. Industrial and developing countries are discussed separately, because of differences in the methodology used to calculate net foreign asset positions.

### **A. Industrial Countries**

The data are presented for the period 1970-1997, and are reported as ratios to GDP. For those countries for which consistent data on the net foreign asset position are available since 1970 (Canada, United Kingdom) we have used this measure in 1970 as the initial value for CUMCA. For France, the Netherlands, New Zealand, Portugal and Switzerland we have used Sinn’s estimate of net foreign assets.<sup>15</sup> For the remaining industrial countries, CUMCA in 1970 is given by the adjusted cumulative current account.

As a first step, we consider aggregate CUMCA measures for the group as a whole in Figure 1. The mean and median CUMCA positions are shown in the first panel: there is little difference between the two statistics. The group of developed nations experienced a progressive accumulation of net foreign liabilities throughout the 1970s and early 1980s but the trend has reversed since 1985, with a sustained improvement in CUMCA in recent years.

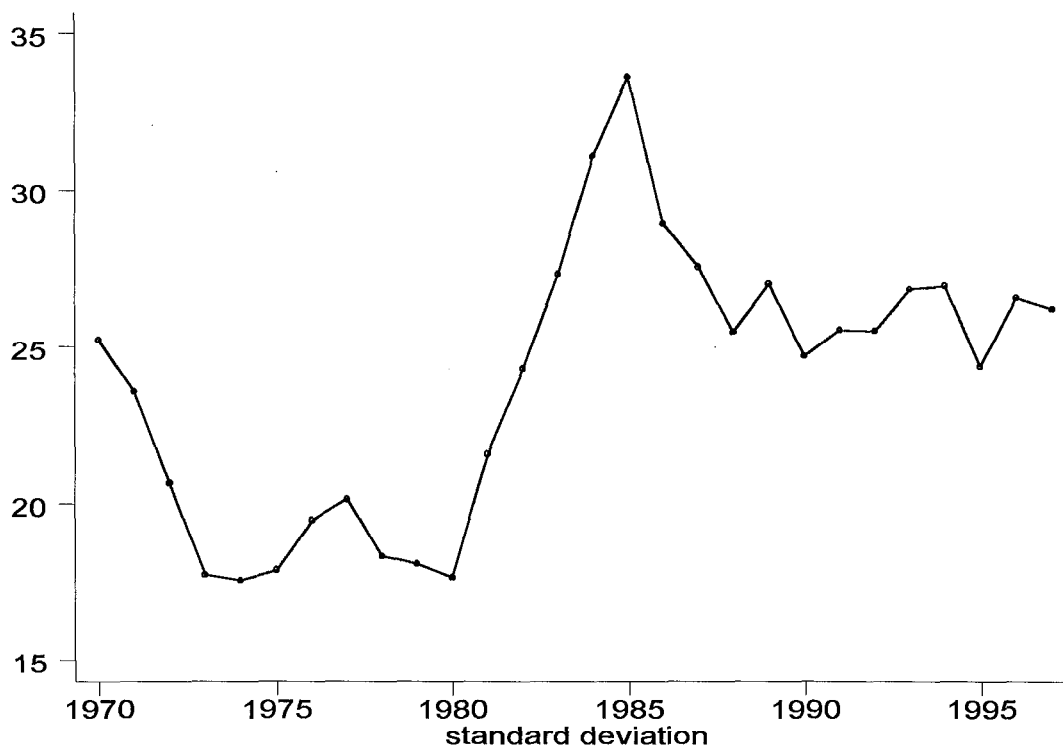
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<sup>14</sup> Current account data for Belgium refers to Luxembourg as well, the IIP data to Belgium only.

<sup>15</sup> For France, the Netherlands, New Zealand and Portugal this choice motivated by the short pre-1970 time span for which a consistent current account series is available (for Portugal the series actually starts in 1972). For Switzerland, the cumulative current account significantly underestimates net foreign assets. For New Zealand, Sinn’s estimate is augmented by the estimated net FDI position (not reported by Sinn) calculated using cumulative flows.



Figure 1. Net Foreign Assets, Industrial Countries (Average)



The second panel shows the standard deviation in CUMCA positions across the group. Dispersion in net foreign asset holdings is interesting, since we might expect that capital account liberalization and international financial market integration would permit countries to diverge more widely in their net external positions.<sup>16</sup> In line with the sharp rise in the average net foreign liability position during the early 1980s, the standard deviation also peaked during this interval. Comparing the 1970s and the 1990s, the standard deviation is clearly higher during the most recent period.

The plots for individual countries are shown in Figure 2. For many countries, *CUMCA* gives a very similar overall picture of trends in net foreign asset positions when compared to the *IPNFA* variable, which is a direct estimate of the stock position. Nevertheless, there are some significant differences. For instance, CUMCA severely understates Switzerland's net foreign asset position, while it overstates the Canadian position.<sup>17</sup>

Using the CUMCA measure, Table 2 shows the distribution of countries across three categories: (i) permanent debtors; (ii) permanent creditors; and (iii) "switchers" (countries that have moved between debtor and creditor status).<sup>18</sup> Relatively few countries have maintained positive net foreign asset positions throughout the 1970-97 period and the rest of the group are almost evenly split between persistent debtors and switchers. The fact that some countries have maintained permanently negative NFA positions that are quite large in a number of cases (e.g. Canada, Australia, New Zealand) does suggest open access to international credit for these countries over a sustained interval.

As Figure 2 shows, the adjusted cumulative current account tracks fairly accurately IPNFA positions over the long run. However, we would expect the relationship at higher frequencies between the current account and changes in net foreign assets to be weaker. Net foreign asset positions can fluctuate quite sharply on a year-on-year basis, due to the valuation changes induced by exchange rate and asset market fluctuations, that are not reflected in the current account. Table 3 provides evidence on this issue by showing correlations between the current account and first differences of CUMCA and IPNFA—all relative to GDP. For some

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<sup>16</sup> Consider two countries whose desired NFA positions are quite different, due to differences in rates of time preferences, demographics, natural resource endowments or fiscal policies. If international asset trade is restricted, their actual NFA positions may be quite similar. It follows that reducing barriers to international investments should lead to a wider dispersion.

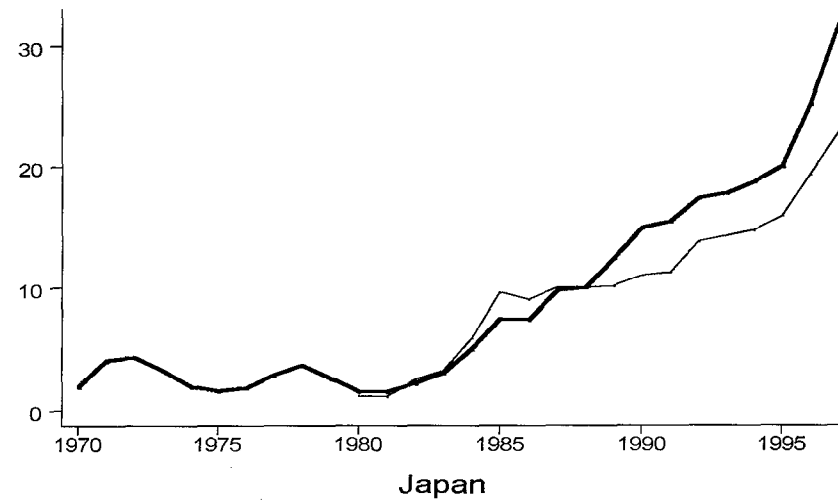
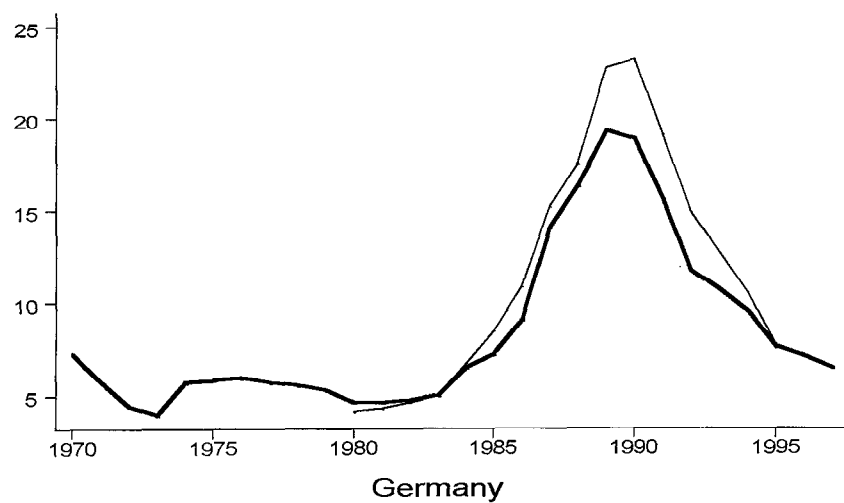
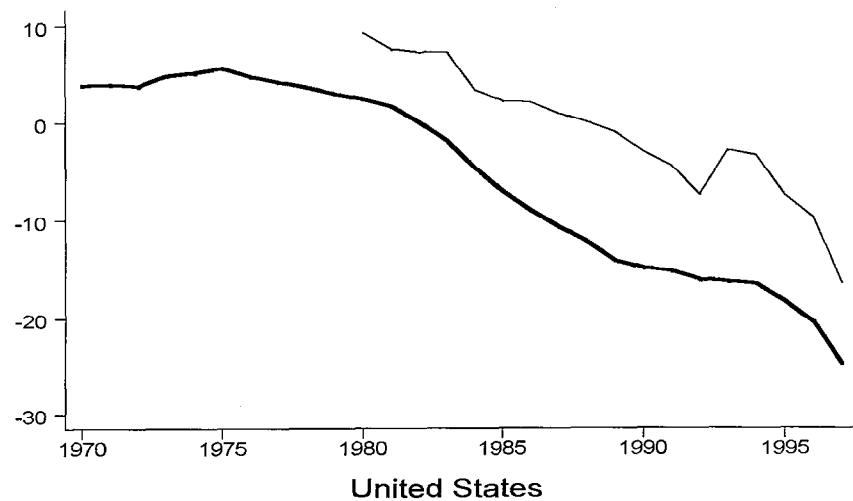
<sup>17</sup> For Canada, the discrepancy is mainly due to Canadian holdings of foreign equities, whose stock value has risen much more slowly than the adjusted cumulative flow. For Switzerland, the balance of payments data does not report any flow of equity or FDI prior to 1983 even though the estimated stock reported for 1984 is substantial.

<sup>18</sup> The creditor/debtor terminology is not strictly accurate, since we also include non-debt assets and liabilities, but is employed for convenience.

Table 2. Industrial Countries: CUMCA Positions

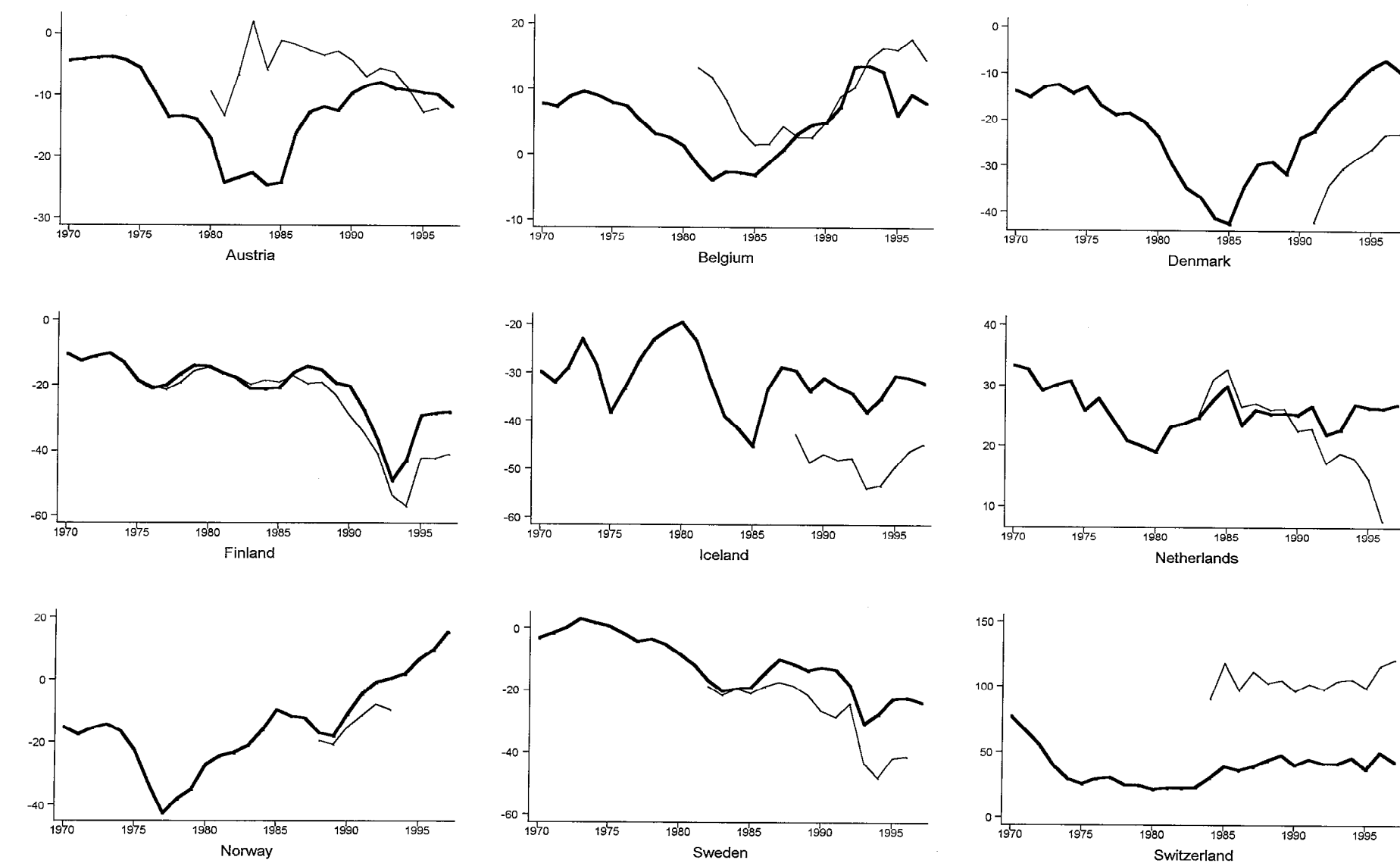
DEBTORS	CREDITORS	SWITCHERS
Austria	Germany	USA
Denmark	Netherlands	Belgium-Luxembourg
Canada	Switzerland	France
Finland	Japan	Italy
Greece		Norway
Iceland		Sweden
Ireland		United Kingdom
Portugal		
Spain		
Australia		
New Zealand		

Figure 2. Net Foreign Assets, Industrial Countries



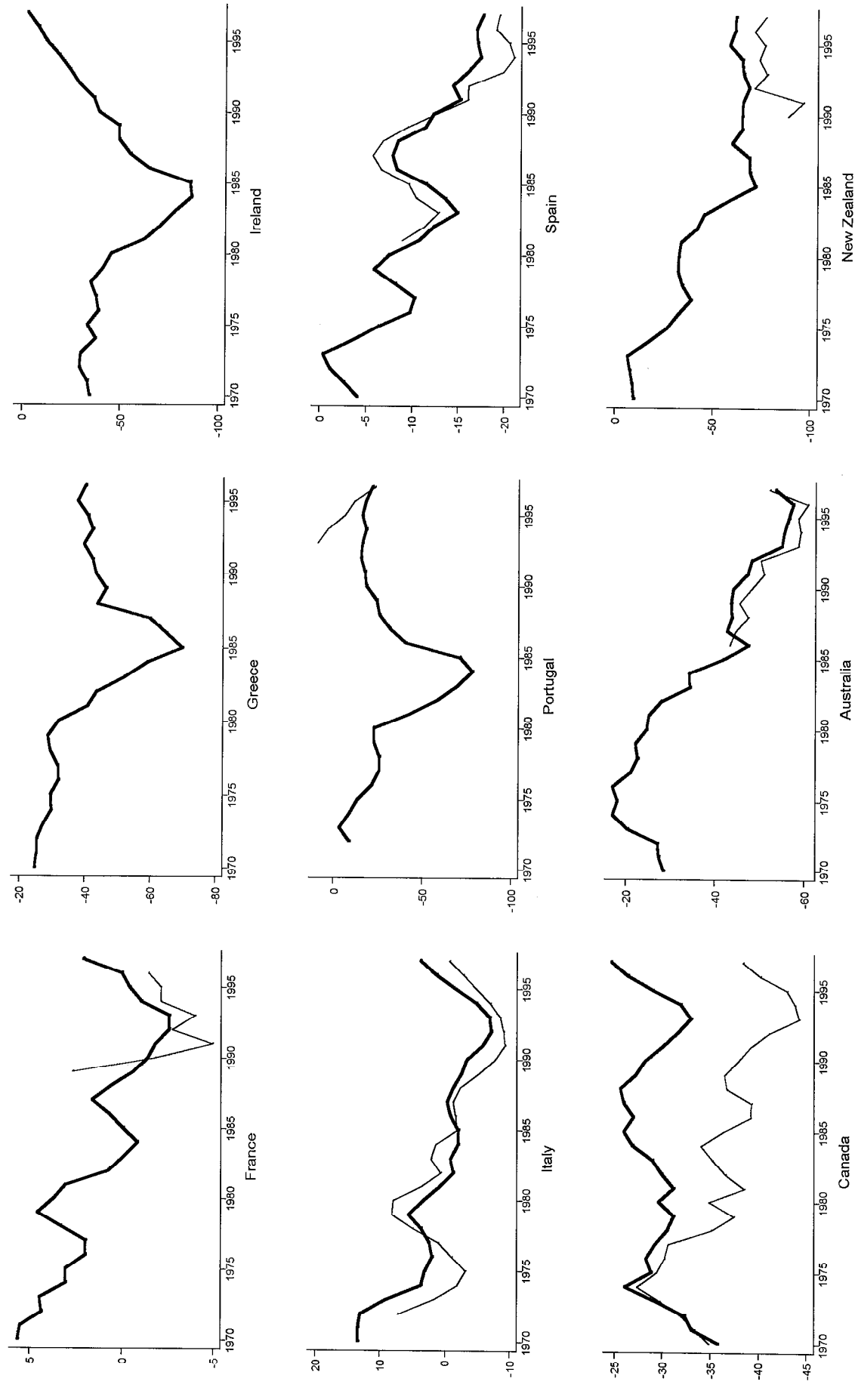
— Cumulative current account  
— International investment position

Figure 2. Net Foreign Assets, Industrial Countries



— Cumulative current account  
— International investment position

Figure 2. Net Foreign Assets, Industrial Countries



— Cumulative current account  
- - - International investment position

Table 3. Changes in Net Foreign Assets and Current Account:  
Correlations for Industrial Nations, 1970-97

	COR1	COR2	COR3
USA	0.76	0.70	0.06
UK	0.54	0.78	0.47
Austria	0.94	0.37	0.39
Belgium-Lux.	0.29	*	*
Denmark	0.96	0.41	0.68
France	0.84	0.52	0.76
Germany	0.88	0.96	0.95
Italy	0.96	0.77	0.73
Netherlands	0.11	0.56	-0.39
Norway	0.97	0.95	0.82
Sweden	0.79	0.15	0.18
Switzerland	0.15	0.73	-0.44
Canada	0.73	0.82	0.67
Japan	0.85	0.50	0.73
Finland	0.94	0.45	0.50
Greece	0.91		
Iceland	0.99	0.40	0.38
Ireland	0.99		
Portugal	0.98		
Spain	0.83	0.89	0.78
Australia	0.37	0.92	0.32
New Zealand	0.78	0.27	0.20

Note: COR1 is correlation of current account and first difference of CUMCA, each expressed as a ratio to GDP. COR2 is correlation of first differences of CUMCA and IPNFA, each expressed as a ratio to GDP. COR3 is correlation of current account and first difference of IPNFA, each expressed as a ratio to GDP. Period: 1970-97 (or period for which IPNFA is available).

\* COR2 and COR3 not shown because the current account and cumulative current account refer to Belgium-Luxembourg, IPNFA to Belgium only.

countries, such as Germany, Italy and Spain, all correlations are high. For a number of others (Australia, Netherlands, Switzerland, United States, United Kingdom) the correlation between the current account and changes in the net foreign asset position is low or even negative, but CUMCA tracks changes in the IPNFA position much more closely. This provides further support for our methodology.

### **B. Developing Countries**

The net external assets measures we consider are CUMCA, NFA and, for a few countries, IPNFA. Figure 3 plots the average and median aggregate NFA measure for the developing country group as a whole (the picture using CUMCA is similar). During the 1970s the average net foreign asset position is relatively stable until the second oil shock. It then declines substantially until then mid-1980s, and improves again until 1996. The dispersion of NFA is stable during the 1970s, increases sharply during the 1980s and is again relatively stable during the 1990s. Figure 4 plots developing countries' average net external position by region. It is interesting to note that the pattern for Asian countries is substantially different from the pattern for African and Latin American countries, even when we exclude the Gulf States Kuwait, Oman and Saudi Arabia (bottom panel). The average net external position for Asian countries shows no trend, while in both Latin America and Africa there is a steady deterioration during the late 1970s/early 1980s and a turnaround in the mid-eighties.

Figure 5 shows the plots for individual countries. Many Latin American countries share similar dynamics of their external position, with a sharp worsening in the early eighties during the debt crisis and an improvement starting in the mid- and late-eighties. Morocco and Mauritius also show a similar pattern. There is more heterogeneity among Asian countries: for example, Malaysia and Thailand share a brief turnaround in the mid-eighties, followed by another period of steady decline. In Argentina, Mexico and Syria, among others, net external liabilities measured with NFA are significantly larger than CUMCA, especially in the 1980s, reflecting unrecorded capital outflows. The opposite is true in Costa Rica.

Table 4 summarizes the net external position as of 1997 using CUMCA and NFA. Most of the countries in our sample are debtors, the exceptions being Botswana, Venezuela, the Arab oil producers (Oman, Kuwait, Saudi Arabia), Singapore and Taiwan province of China. The countries with the largest net external liabilities in our sample are Côte d'Ivoire, Jamaica and Jordan. Jordan is also the country 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 net asset position would improve dramatically, with net liabilities of around 10 percent of GDP in 1997. The correlations between first differences of the various NFA measures, reported in Table 5, are generally high.

### **C. Net Foreign Assets: Some Basic Correlations**

It is interesting to explore how the net external position of countries is related to characteristics such as the level of development, size and openness to trade. For example, the



Figure 3. Net Foreign Assets, Developing Countries



Figure 4. Developing countries: Net External Position by Region, 1970-97

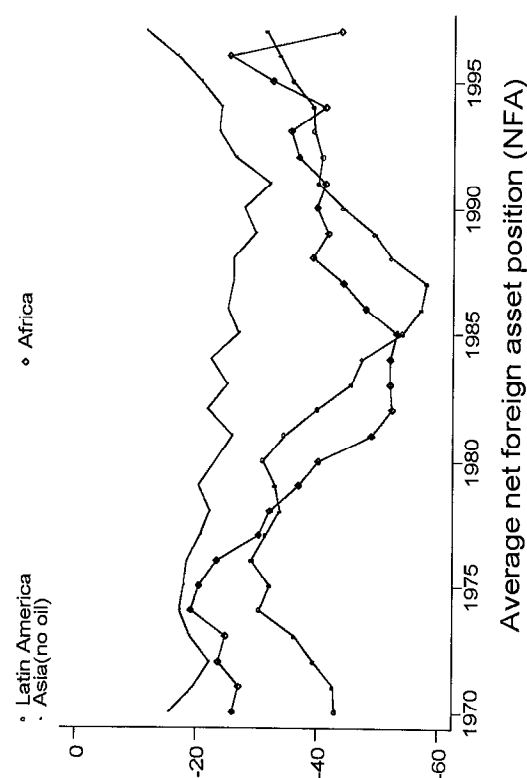
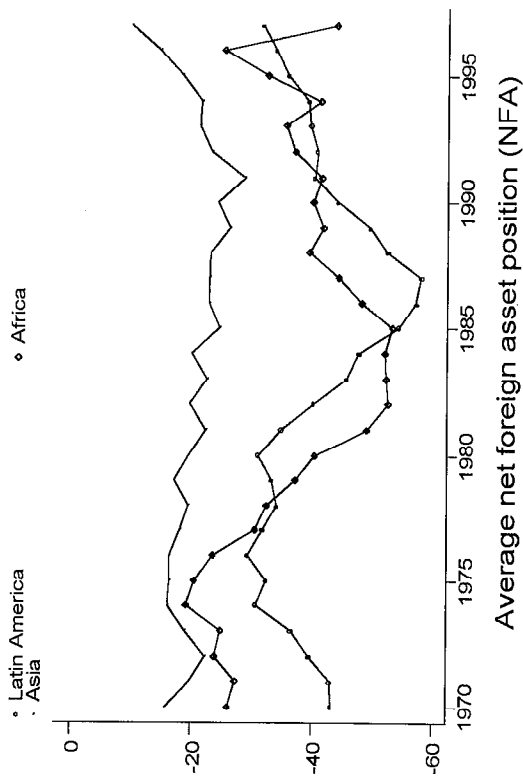
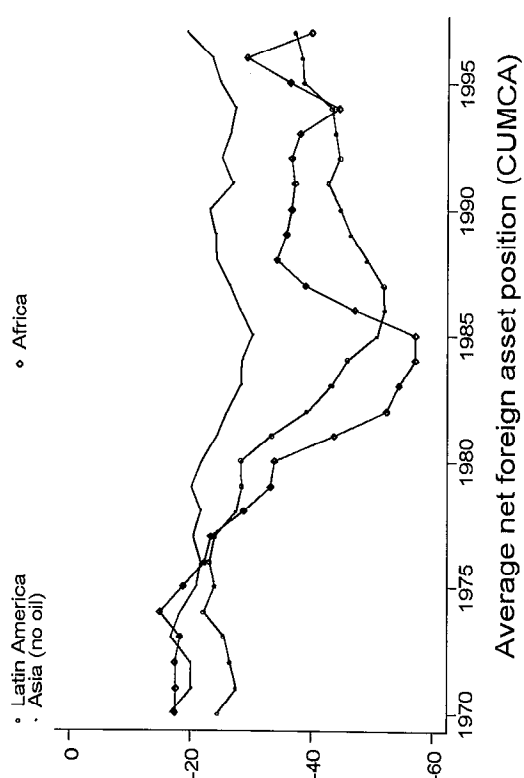
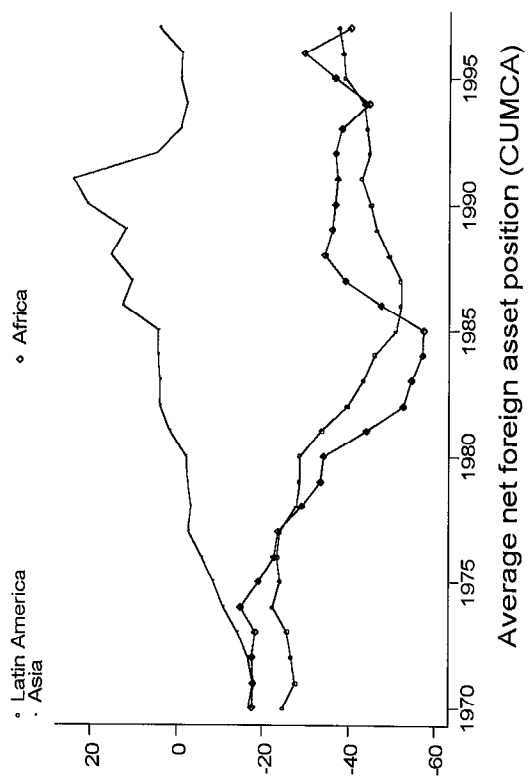
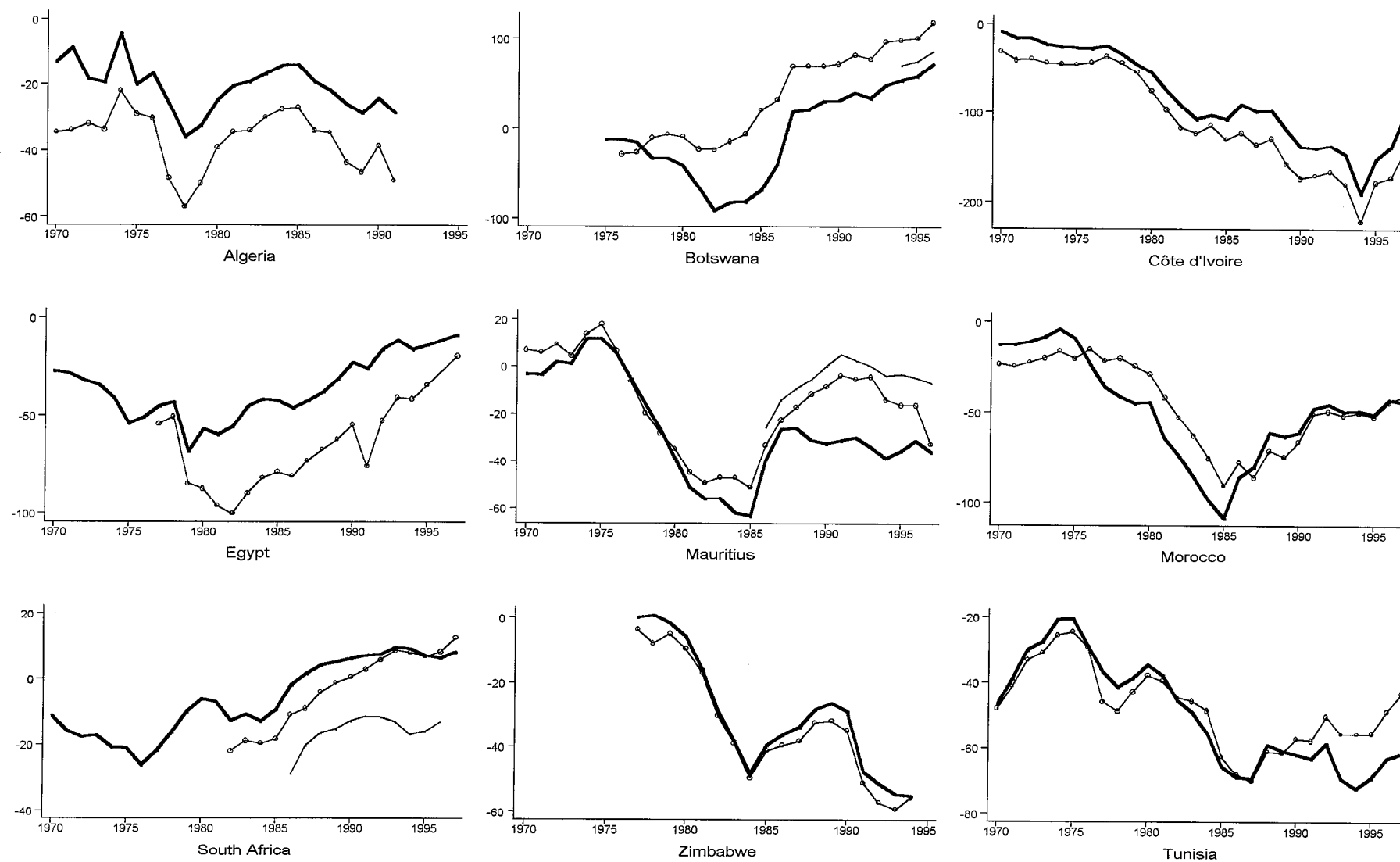
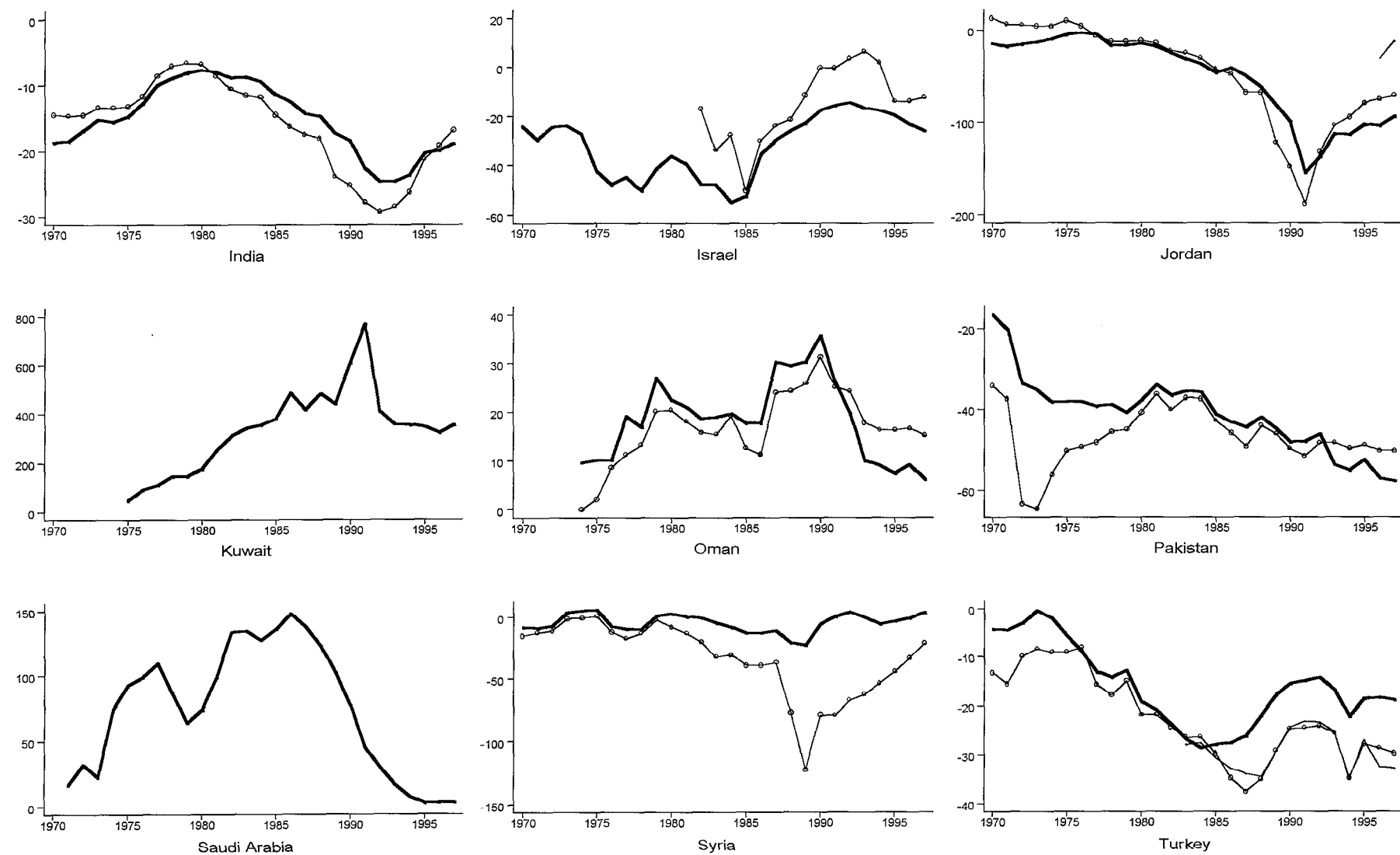


Figure 5. Net Foreign Assets, Developing Countries



— Cumulative current account  
 — International investment position  
 —○— Cumulative capital flows

Figure 5. Net Foreign Assets, Developing Countries



— Cumulative current account  
 — International investment position  
 — Cumulative capital flows

Figure 5. Net Foreign Assets, Developing Countries

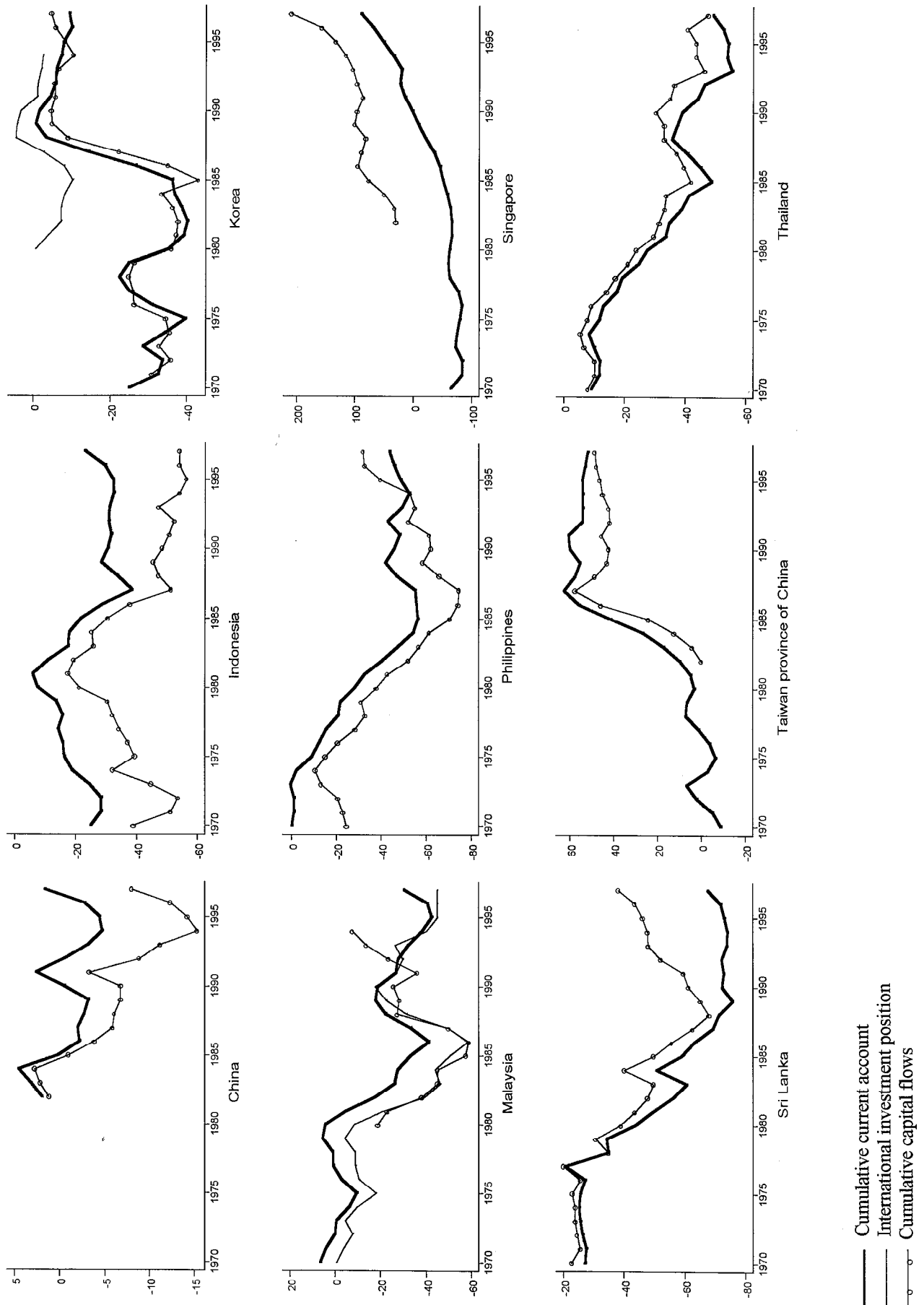


Figure 5. Net Foreign Assets, Developing Countries

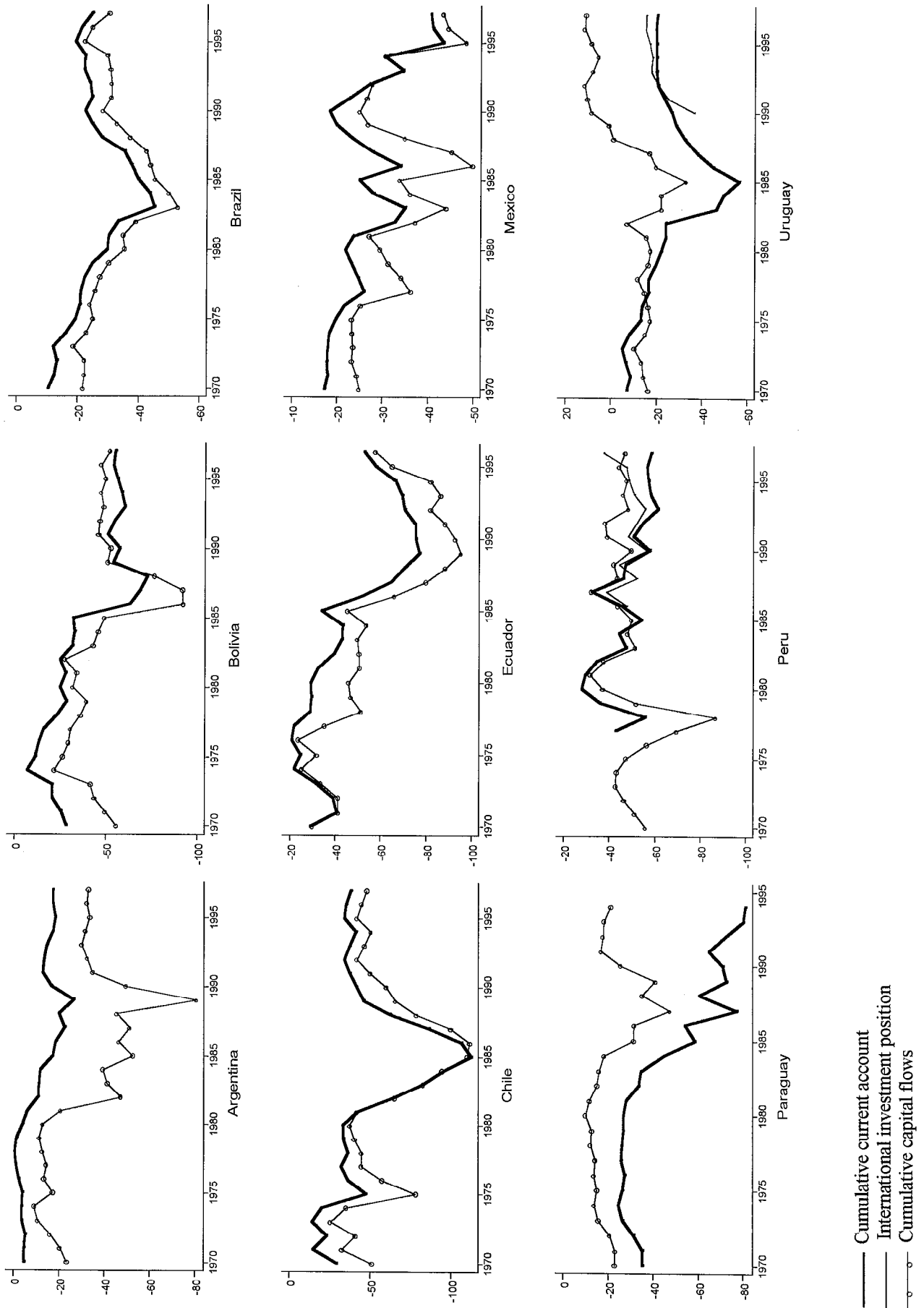


Figure 5. Net Foreign Assets, Developing Countries

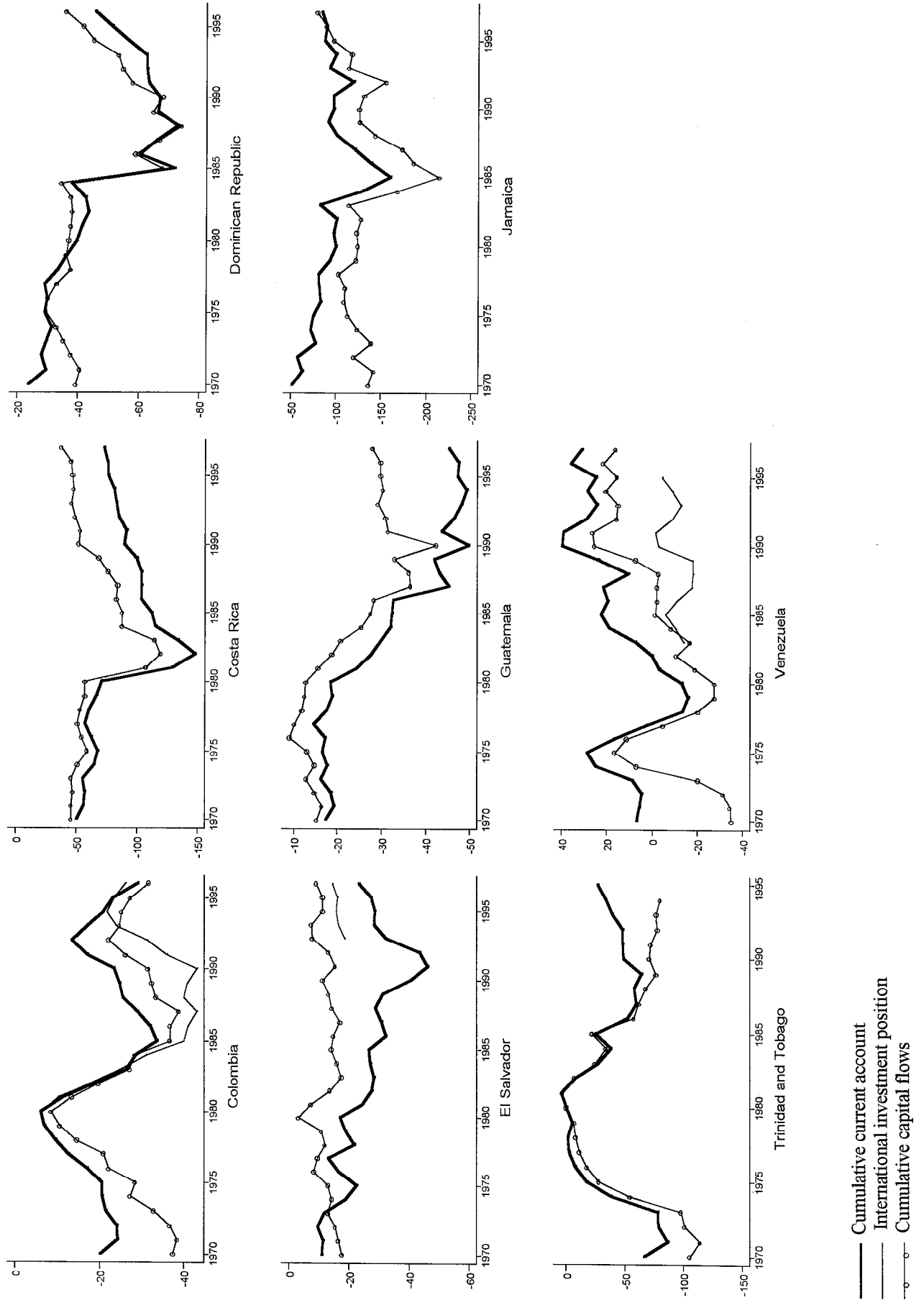


Table 4. Developing Countries: Net External Position as of 1997

A. Cumca				
Creditors	Debtors (0 to 20%)	Debtors (20 to 40%)	Debtors (40 to 60%)	Debtors (over 60%)
Botswana* (73.5)	Argentina (-17.1)	Algeria**** (-28.2)	Bolivia (-54.8)	Costa Rica (-72.6)
China (1.7)	Egypt (-8.4)	Brazil (-24.8)	Dominican Rep.* (-45.7)	Côte d'Ivoire (-97.6)
Kuwait (356.4)	India (-18.8)	Chile (-37.9)	Ecuador* (-52.3)	Jamaica (-84.0)
Oman (6.2)	Korea (-9.1)	Colombia* (-29.1)	Guatemala (-45.1)	Jordan (-92.9)
Saudi Arabia (3.8)	Turkey (-18.7)	El Salvador (-23.3)	Mexico (-40.6)	Paraguay*** (-80.9)
Singapore (90.2)		Indonesia (-22.9)	Morocco (-44.5)	Sri Lanka (-67.5)
South Africa (8.4)		Israel (-25.8)	Pakistan (-57.5)	Tunisia (-61.5)
Syria (3.7)		Malaysia (-30.1)	Peru (-58.3)	
Taiwan p.o.C. (52.0)		Mauritius (-35.6)	Philippines (-43.3)	
Venezuela (31.3)		Trinidad** (-26.4)	Thailand (-49.0)	
		Uruguay (-20.0)	Zimbabwe*** (-54.9)	
B. NFA				
Creditors	Debtors (0 to 20%)	Debtors (20 to 40%)	Debtors (40 to 60%)	Debtors (over 60%)
Botswana* (120.2)	China (-8.0)	Argentina (-32.9)	Algeria**** (-49.1)	Côte d'Ivoire (-139.1)
Oman (15.1)	Egypt (-19.3)	Brazil (-30.1)	Bolivia (-52.0)	Jamaica (-78.9)
Singapore (210.2)	El Salvador (-9.1)	Costa Rica (-37.4)	Chile (-47.7)	Jordan (-70.0)
South Africa (15.5)	India (-16.8)	Colombia* (-31.6)	Ecuador* (-57.3)	Trinidad*** (-79.9)
Taiwan p.o.C.	Israel (-12.1)	Dominican Rep* (-35.9)	Indonesia (-54.2)	
Uruguay (11.4)	Korea (-4.6)	Guatemala (-27.8)	Malaysia (-44.9)	
Venezuela (16.4)		Mauritius (-32.7)	Mexico (-43.2)	
		Paraguay*** (-21.2)	Morocco (-40.9)	
		Philippines (-31.7)	Pakistan (-50.3)	
		Sri Lanka (-38.1)	Peru (-46.5)	
		Syria (-21.7)	Thailand (-47.3)	
		Turkey (-29.8)	Tunisia (-43.0)	
			Zimbabwe*** (-55.3)	

CUMCA: adjusted cumulative current account. NFA: net FDI+net equity+reserves+estim. assets-external debt.

\* Data for 1996. \*\* Data for 1995. \*\*\* Data for 1994. \*\*\*\* Data for 1991.



Table 5. Developing Countries: Current Account and Changes in Net Foreign Assets, 1970-97.

	COR1		COR 1
Turkey	0.92	Egypt	0.77
South Africa	0.80	Sri Lanka	0.93
Argentina	0.23	Taiwan p.o.C.	0.99
Bolivia	0.51	Indonesia	0.47
Brazil	0.80	Korea	0.97
Chile	0.63	Malaysia	0.80
Colombia	0.95	Philippines	0.65
Costa Rica	0.59	Singapore	0.96
Dominican Rep.	0.63	Thailand	0.60
Ecuador	0.83	Algeria	0.83
El Salvador	0.86	Botswana	0.96
Guatemala	0.69	Côte d'Ivoire	0.57
Mexico	0.66	Mauritius	0.98
Paraguay	0.90	Morocco	0.87
Peru	0.62	Tunisia	0.71
Uruguay	0.76	Jordan	0.41
Venezuela	0.90	India	0.79
Jamaica	0.41	Pakistan	0.78
Trinidad & Tob.	0.84	Zimbabwe	0.94
Israel	0.97	Kuwait	1.00
Oman	0.79	Saudi Arabia	1.00
Syria	0.98	China	0.86

Note: COR1 is correlation of current account and first difference of CUMCA, each expressed as a ratio to GDP. Period: 1970-97.

	COR1	COR2	COR3
Turkey	0.92	0.58	0.51
South Africa	0.80	0.20	0.12
Colombia	0.95	0.66	0.77
Peru	0.62	0.03	0.12
Venezuela	0.90	0.97	0.95
Korea	0.97	0.89	0.92
Malaysia	0.80	0.62	0.67

Note: COR1 is correlation of current account and first difference of CUMCA, each expressed as a ratio to GDP. COR2 is correlation of first differences of CUMCA and IPNFA, each expressed as a ratio to GDP. COR3 is correlation of current account and first difference of IPNFA, each expressed as a ratio to GDP. Period: 1970-97 (or period for which IPNFA is available).

“stages” hypothesis predicts a positive relationship between the level of development and the net foreign asset position (Eichengreen, 1991): as a country moves from being capital-scarce to capital-abundant, it evolves from the status of a net debtor to a net creditor. However, the relationship may be nonlinear: in models of imperfect capital markets, a middle-income country may be better positioned than a low-income country to raise external finance since it can offer more collateral and co-finance a larger share of domestic investment projects, such that external debt initially is increasing in the level of GDP per capita before the relationship turns negative at a more advanced stage of development (Lane 1997, 1998a) .

The level of development plausibly also influences the composition of external stock positions. In particular, the equity-debt ratio in external liabilities may be increasing in the level of GDP per capita. With respect to FDI, higher education levels may be required to attract FDI inflows (Borensztein et al (1998)); high domestic incomes may also attract foreign firms that wish 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 the level of development and portfolio inflows (Calvo and Mendoza, 1996).

Similarly, trade openness may influence both the 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 1997, 1998c). On the other side, however, openness may also 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). With respect to composition, the greater vulnerability of open economies means that equity-type liabilities may be preferred to debt for insurance purposes. 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 significant 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 the total size of the economy.

The determinants of the net foreign asset position are explored in Table 6, using CUMCA as measure of net foreign assets. Panel A reports bivariate and multivariate regressions for the whole sample and Panels B and C for industrial and developing countries (including and excluding oil-producers from the Arab peninsula). GDP per capita, trade openness and population are taken from the Penn World Tables (see Summers and Heston (1991)); trade openness is the ratio of exports plus imports to GDP. The results for industrial countries using IPNFA are similar, notwithstanding the smaller sample, and hence not reported.

Taken together, the results support a positive relationship between net foreign assets and YC, which is in line with the “stages” hypothesis. The impact of YC is weaker in industrial than in

Table 6. Correlates of Net Foreign Assets (CUMCA)

A. Full sample

	(1) Full	(2) Full	(3) Full	(4) Full	(5) No oil	(6) No oil	(7) No oil	(8) No oil
YC	27.9 (3.25)			27.2 (3.59)	20.7 (3.97)			21.7 (3.99)
OPEN		0.21 (2.05)		0.17 (2.44)		0.13 (1.56)		0.20 (3.75)
SIZE			-2.5 (-0.40)	2.81 (0.46)			4.04 (1.64)	9.05 (3.48)
adj.R <sup>2</sup>	0.11	0.02	0.00	0.13	0.22	0.03	0.03	0.35
N	66	66	66	66	63	63	63	63

B. Industrial countries

	(1)	(2)	(3)	(4)
YC	21.7 (1.42)			25.6 (1.63)
OPEN		0.22 (1.44)		0.49 (2.89)
SIZE			5.40 (2.11)	9.45 (2.98)
adj.R <sup>2</sup>	0.05	0.07	0.10	0.40
N	22	22	22	22

C. Developing countries

	(1) Full	(2) Full	(3) Full	(4) Full	(5) No oil	(6) No oil	(7) No oil	(8) No oil
YC	64.0 (2.15)			70.4 (2.25)	30.8 (2.98)			35.9 (2.79)
OPEN		0.22 (1.98)		-0.06 (-0.37)		0.13 (1.26)		0.11 (1.40)
SIZE			-5.80 (-0.65)	3.94 (0.52)			4.04 (1.64)	10.2 (2.38)
adj.R <sup>2</sup>	0.23	0.02	0.01	0.23	0.20	0.03	0.03	0.33
N	44	44	44	44	41	41	41	41

Dependent variable is CUMCA/GDP (average 1990-1997). YC is income per capita, OPEN is the ratio of exports plus imports to GDP, POP is population. YC and POP are entered in logs. The no oil sample excludes Kuwait, Oman and Saudi Arabia. t-statistics in parentheses.

developing nations (smaller point estimate, less significant) suggesting that the true relationship may be nonlinear. The variable OPEN is generally positive and significant, but its effect is weaker for developing nations. This may just reflect a tight relationship between openness and GDP per capita in this sub-sample (Hall and Jones 1999). An alternative interpretation is that openness has two conflicting effects on CUMCA: 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 1997). The former effect may be dominant for rich open economies, since these may not face binding credit constraints and the latter effect may be more important for poorer nations, that wish to borrow as much as is feasible on external markets. The effect of SIZE is positive and significant across sub-samples.

## **V. THE COMPOSITION OF THE NET EXTERNAL POSITION**

### **A. Industrial Countries**

Along the time series dimension, the stocks of foreign direct investment in relation to GDP have been relatively stable in industrial countries during the seventies and the early eighties, but have shown a substantial increase since then (Figure 6). This trend is common across countries. A similar trend has occurred for the stock of equity capital. Figures 7-9 summarize level and composition of the net external asset position in the cross-section of industrial countries during the 1990s, in relation to GDP per capita and trade openness. It is interesting to note that richer countries tend to have more FDI assets, but no clear pattern exists with respect to net equity holdings. Figure 8 breaks down the net FDI and equity positions into their gross components. It shows that richer countries tend to have both more FDI assets and fewer FDI liabilities. More trade openness is instead associated with larger gross positions. Both equity assets and equity liabilities tend to be larger in more richer and more open countries, as shown in Figure 9. Overall, the link between openness and FDI and equity positions is consistent with the notion that more open economies, being more vulnerable to external shocks, are more “diversified.” In future work, we plan to relate the composition of external assets to other factors, such as indicators of capital account openness.

### **B. Developing Countries**

The evolution of the various components of the external position of developing countries over the past 3 decades is shown in Figure 10. Net debt has been the largest component of external liabilities for developing countries, but has been declining in recent years. Both net FDI and net equity have been rising but net FDI is far more important than net portfolio equity: by 1996, net FDI liabilities were around 15 percent of GDP, whereas average net portfolio equity liabilities were still below 2 percent. Inward FDI stocks declined in relation to the size of the economies for most of the seventies, they were relatively stable during the early eighties and have increased sharply since then. The equity component of external liabilities has instead been negligible until the early nineties, and has since grown sharply.

Figure 6. Industrial Countries: Average Composition of External Position, 1970-97

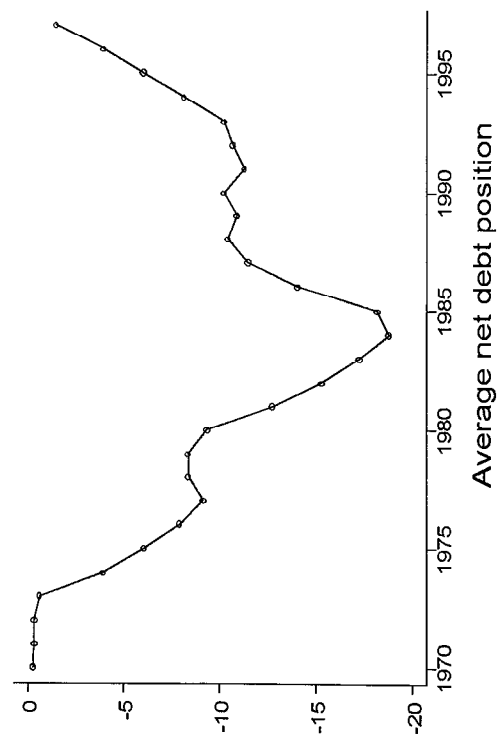
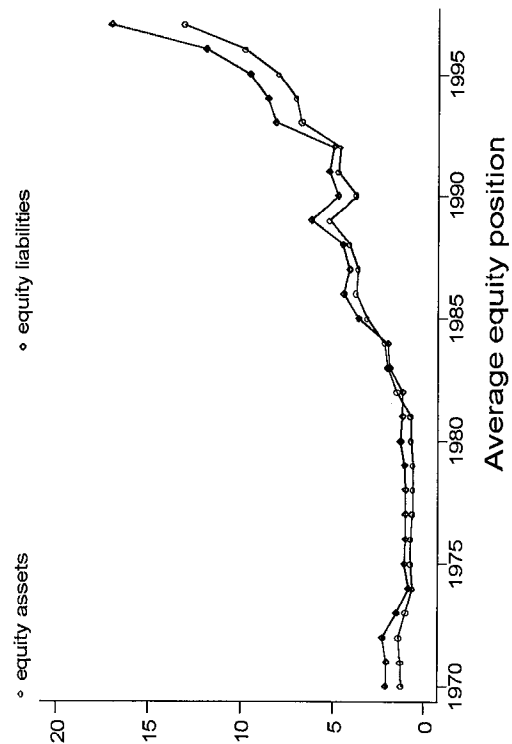


Figure 7. Industrial Countries: Composition of Net External Position (Average 1990s)

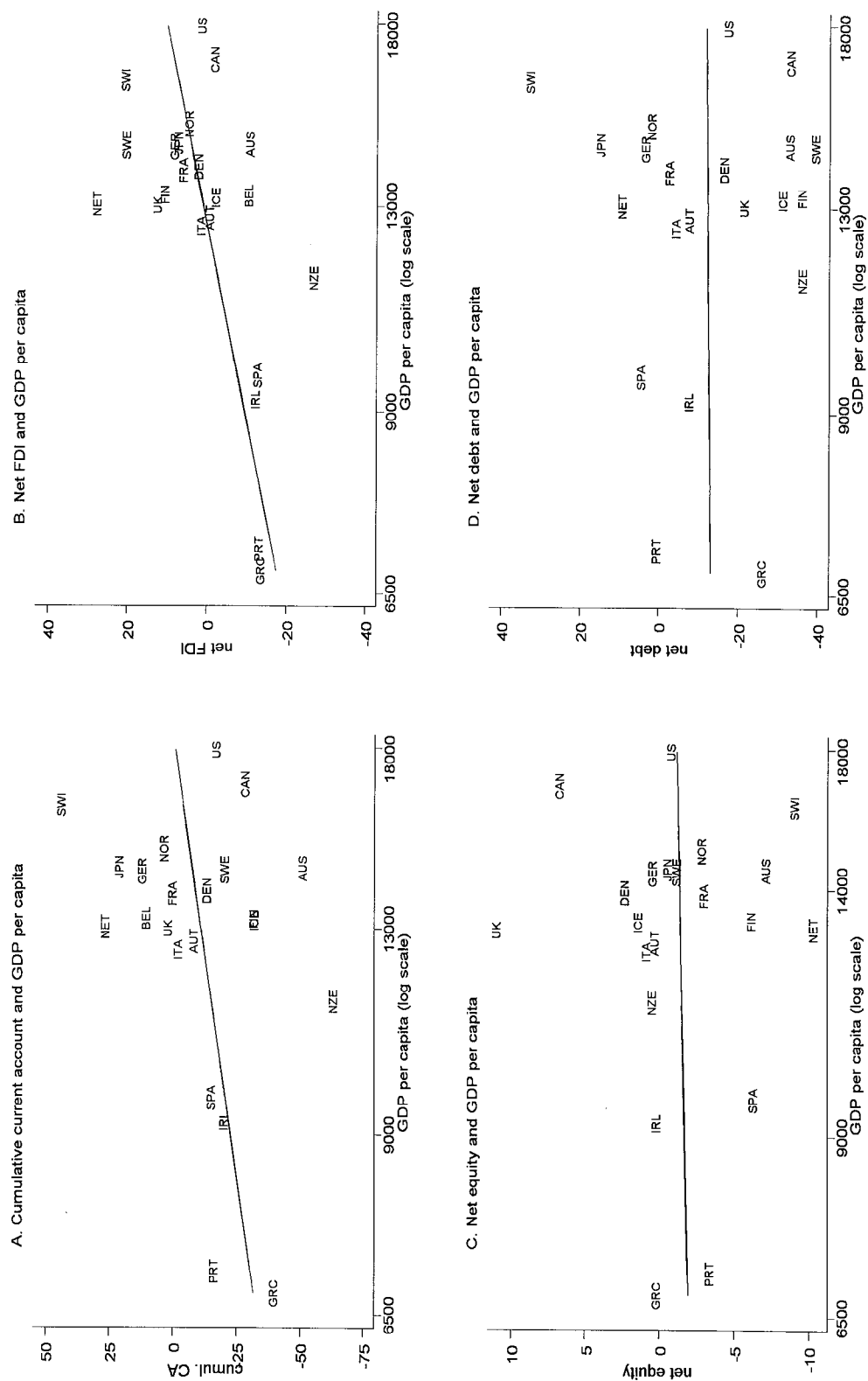




Figure 9. Industrial Countries, Stock of Equity (Average 1990s)

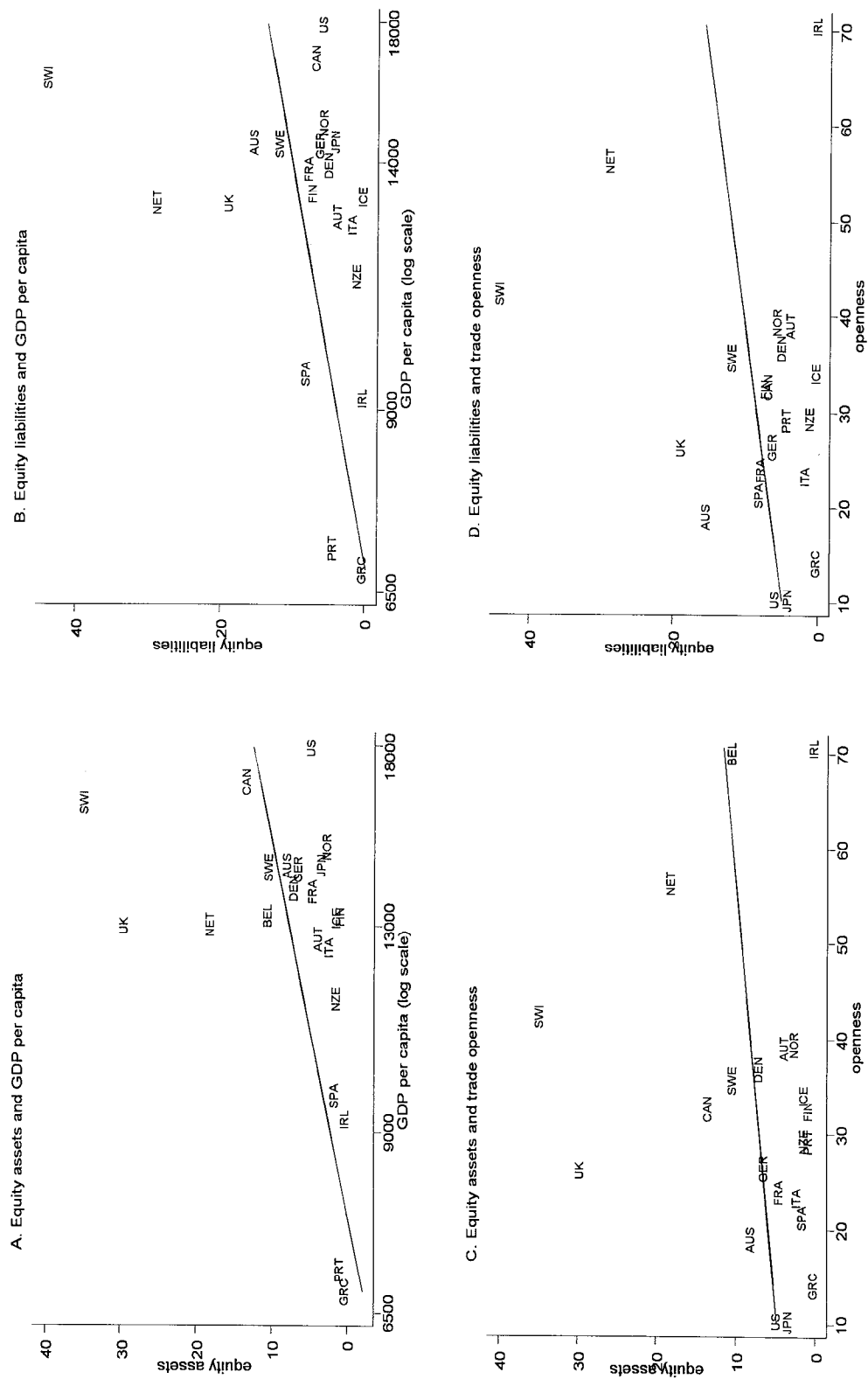
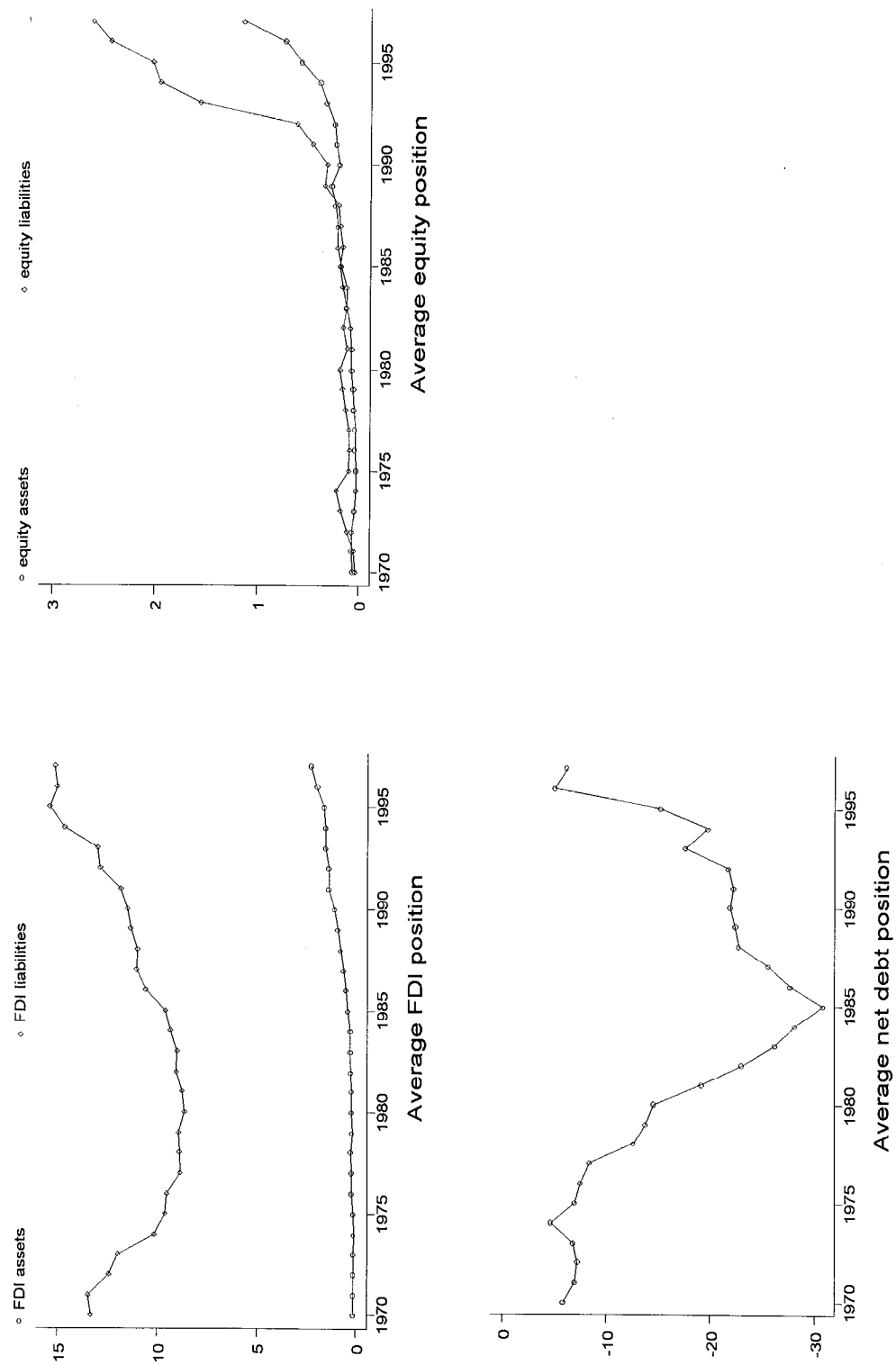




Figure 10. Developing Countries: Average Composition of External Position, 1970-1997\*



\* Cross-country average ratio of stocks to GDP, excluding Kuwait and Singapore. Net debt based on CUMCA definition of net foreign assets.

The level and composition of the net external position for developing economies in the 1990s are summarized in Figures 11-13. The bivariate scatter diagrams confirm the strong relationship between net external position and GDP per capita (Figure 11), which is coming primarily from the relation between net debt and GDP per capita (fourth panel). Figures 12 and 13, which summarize the gross FDI and equity positions, show clearly that only a few richer countries in the “developing” sample have a significant share of equity and/or FDI assets--Kuwait, Singapore and Taiwan province of China. Countries with a large share of FDI liabilities (over 20 percent of GDP) include Malaysia, Singapore, Chile, Costa Rica, Jamaica and Trinidad and Tobago. A majority of developing countries in our sample have small or no equity liabilities, with only a small group, comprising Brazil, Chile, Mexico and Venezuela, with equity liabilities over 4 percent of GDP in 1997.

### **C. The Composition of Foreign Assets and Liabilities: Correlations**

In this sub-section we relate the composition of the external position of developing countries during the 1990s to the same country characteristics identified earlier (GDP per capita, size and openness to trade). In Table 7, we analyze the impact of these determinants on FDI (Panel A) and portfolio equity holdings (Panel B). We examine gross stocks (assets and liabilities) in addition to net stocks. With respect to FDI, 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. In other words, among the industrial nations, it is the relatively less developed that 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.<sup>19</sup> Across subsamples, YC, OPEN and SIZE tend to have significantly positive effects on equity stocks. In the industrial nation sample, more open and larger countries tend to have more negative net equity positions. In contrast, more open countries have more positive net equity positions in the developing nation subsample, suggesting a relationship that varies across levels of development.

Table 8 continues the analysis of the components of the net foreign asset position. Panel A considers net debt positions (a positive value 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 external assets. This measures give similar results, except the SIZE is not significant. Finally, column (5) regresses gross debt

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<sup>19</sup> The regressions exclude Belgium-Luxembourg, a clear outlier. The data on stocks of equity reported in the IIP, which refer to Belgium only, are drastically different for equity liabilities.

Figure 11. Developing Countries: Composition of Net External Position (Average 1990s)

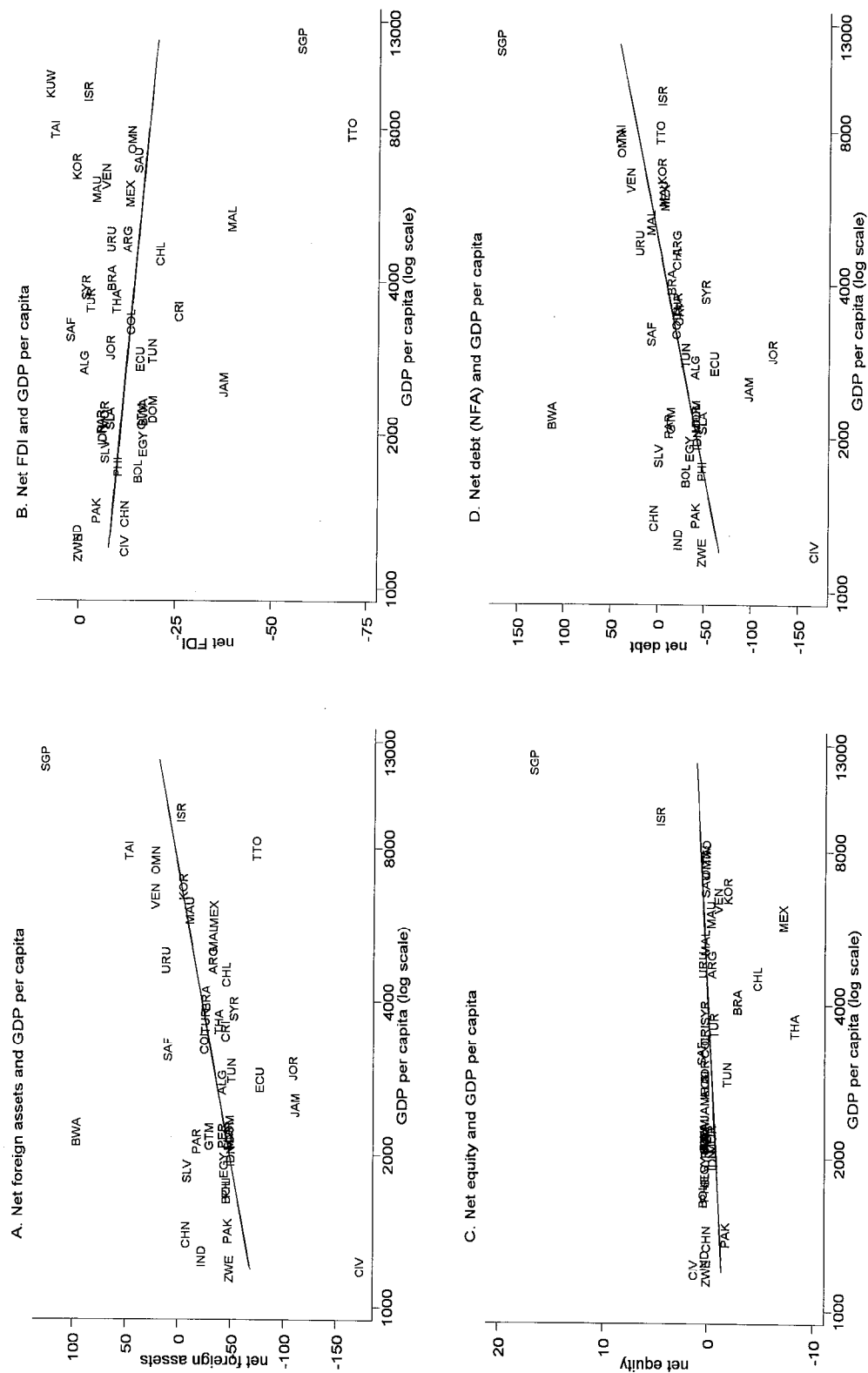


Figure 12. Developing Countries, Stock of Direct Investment (Average 1990s)

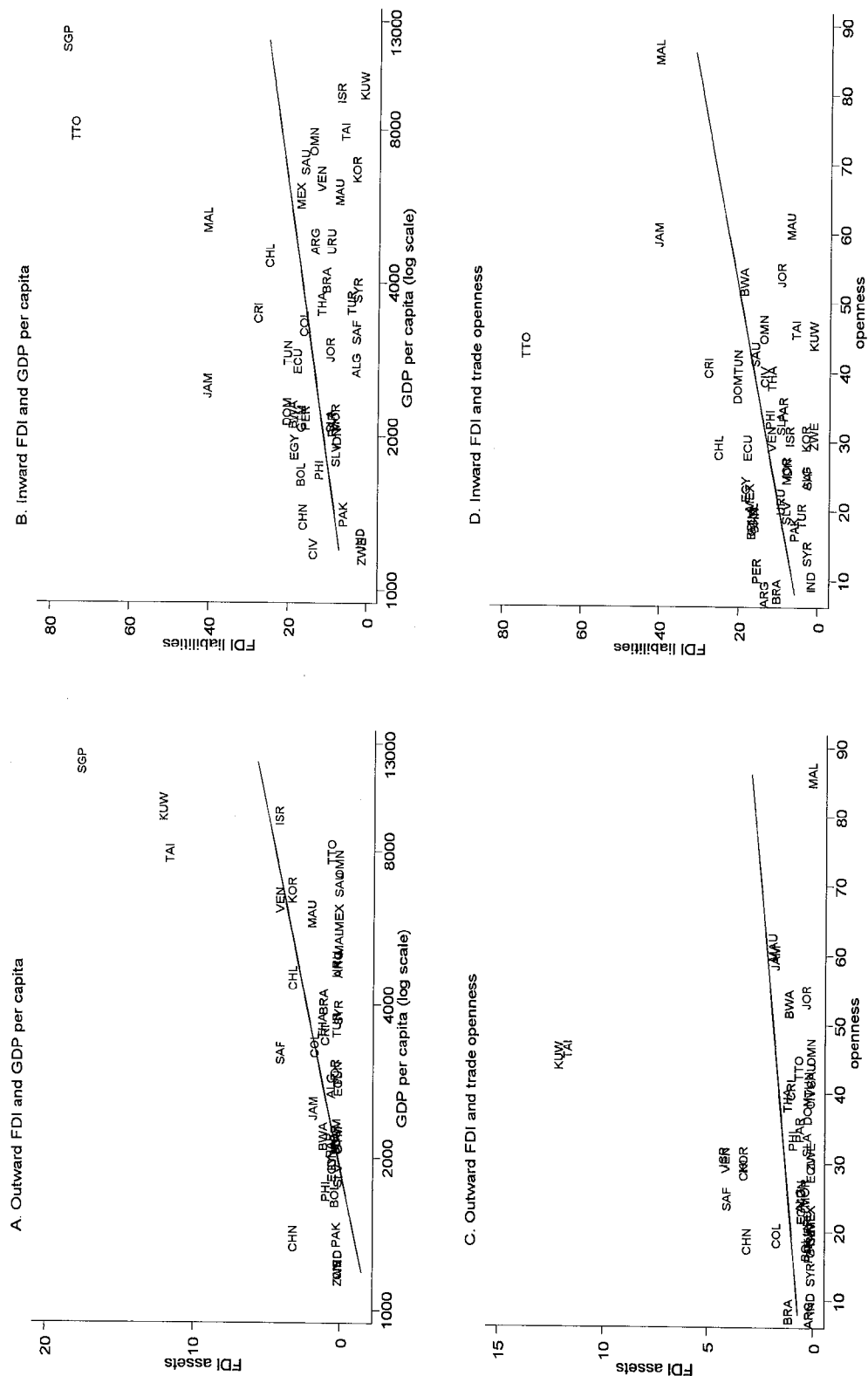
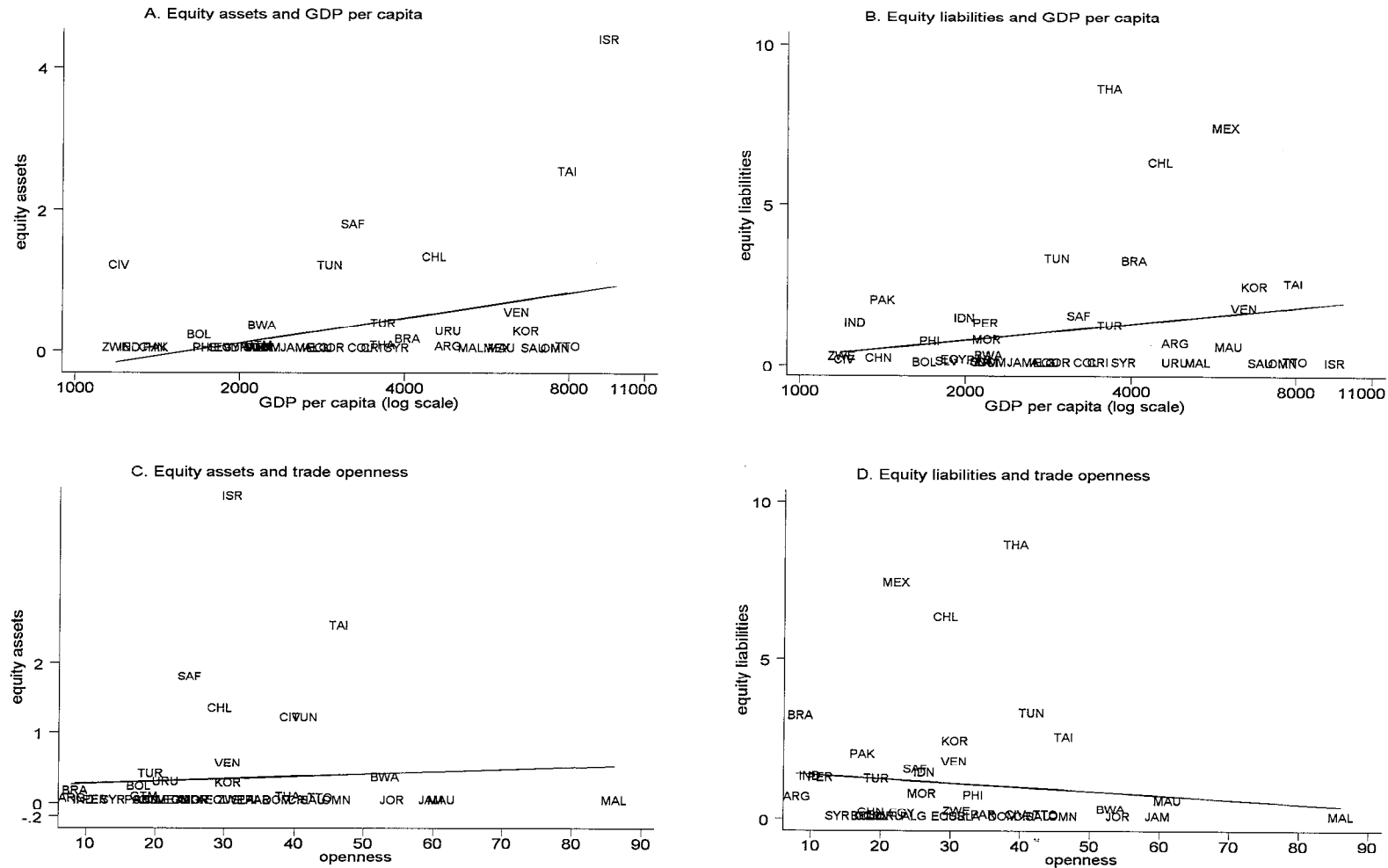


Figure 13. Developing Countries: Stock of Equity (Average 1990s)\*



\* Scatters exclude Singapore.

Table 7. Correlates of foreign-owned capital, industrial countries

A. FDI									
Dep. Var. Sample	(1) Assets Full	(2) Liab. Full	(3) Net Full	(4) Asset Ind	(5) Liab. Ind	(6) Net Ind	(7) Assets Dev	(8) Liab Dev	(9) Net Dev
YC	7.76 (5.56)	0.80 (0.60)	6.75 (3.82)	24.3 (4.09)	-2.32 (-0.59)	26.6 (4.00)	2.37 (2.77)	1.37 (0.34)	0.77 (0.18)
OPEN	0.04 (2.11)	0.16 (4.82)	-0.13 (2.85)	0.22 (1.77)	0.13 (1.53)	0.09 (0.59)	0.04 (5.23)	0.16 (3.88)	-0.13 (-3.18)
SIZE	1.29 (2.19)	-0.19 (-0.14)	1.50 (1.04)	2.11 (1.19)	0.46 (0.23)	1.65 (0.89)	0.66 (2.74)	-0.50 (-0.30)	1.20 (0.71)
adj.R <sup>2</sup>	0.42	0.34	0.29	0.35	0.14	0.31	0.58	0.39	0.28
N	65	66	65	22	22	22	43	44	43

The dependent variable is the average ratio of FDI to GDP for the period 1990-1997 (assets, liabilities and net position). The explanatory variables are 1989 levels. YC is income per capita, OPEN is the ratio of exports plus imports to GDP, POP is population. YC and POP are entered in logs. t-statistics in parentheses.

B. Equity (Portfolio)									
Dep. Var. Sample	(1) Assets Full	(2) Liab. Full	(3) Net Full	(4) Assets Ind	(5) Liab. Ind	(6) Net Ind	(7) Assets Dev	(8) Liab Dev	(9) Net Dev
YC	4.21 (3.86)	4.49 (3.69)	-0.35 (-0.56)	17.4 (2.52)	17.4 (1.91)	-0.02 (-0.01)	0.81 (1.39)	1.30 (2.42)	-0.60 (-0.86)
OPEN	0.07 (4.54)	0.03 (3.61)	0.04 (2.51)	0.18 (2.24)	0.21 (1.69)	-0.03 (-0.49)	0.08 (3.96)	0.04 (4.17)	0.04 (3.42)
SIZE	1.28 (3.27)	1.14 (3.29)	0.17 (0.59)	1.99 (1.94)	1.98 (1.81)	0.01 (0.01)	0.90 (2.89)	0.97 (4.09)	-0.02 (0.06)
adj.R <sup>2</sup>	0.43	0.30	0.20	0.31	0.27	0.03	0.76	0.56	0.50
N	64	64	64	21	21	21	43	43	43

The dependent variable is the average ratio of portfolio equity to GDP for the period 1990-1997 (assets, liabilities and net position). The explanatory variables are 1989 levels. YC is income per capita, OPEN is the ratio of exports plus imports to GDP, POP is population. YC and POP are entered in logs. t-statistics in parentheses. The regressions exclude Belgium-Luxembourg.

Table 8. Correlates of Debt and Equity/Debt Ratio

A. Debt (all countries)					
	(1)	(2)	(3)	(4)	(5)
	Full	Ind	Dev	Dev	Dev
	Net (CA)	Net (CA)	Net (CA)	Net (NFA)	Liab
YC	17.5 (3.08)	6.31 (0.42)	39.4 (3.08)	35.0 (2.25)	-23.5 (-2.02)
OPEN	0.32 (4.94)	0.76 (3.55)	0.17 (2.01)	0.39 (2.83)	-0.03 (-0.39)
SIZE	8.08 (2.93)	10.3 (3.55)	9.19 (2.08)	6.64 (1.16)	-7.39 (-2.15)
R <sup>2</sup>	0.32	0.56	0.38	0.37	0.17
N	62	22	40	40	41

Dependent variable is ratio net debt (debt liabilities) to GDP (average 1990-1997). In columns (1)-(3) the net debt definition is obtained residually from the adjusted cumulative current account. In column (4), net debt is equal to foreign reserves plus estimated external assets minus gross external debt (World Bank). In column (5) debt liabilities are the ratio of gross external debt (World Bank) to GDP. The regressions exclude Kuwait, Oman and Saudi Arabia.

B. Equity/Debt Ratio (developing countries)				
	(1)	(2)	(3)	(4)
YC	1.01 (1.39)			0.26 (1.47)
OPEN		0.02 (3.66)		0.02 (4.38)
SIZE			-0.18 (-1.18)	0.23 (2.66)
R <sup>2</sup>	0.18	0.72	0.04	0.78
N	41	41	41	41

Dependent variable is ratio of FDI plus equity liabilities to gross external debt (World Bank) (average 1990-1997). YC is income per capita, OPEN is the ratio of exports plus imports to GDP, POP is population. YC and POP are entered in logs. t-statistics in parentheses. The regressions exclude Kuwait, Oman and Saudi Arabia.

liabilities on the three determinants for the developing nations subsample: smaller and richer developing countries are found to have greater debt liabilities but openness is not significant. In panel B, the equity-debt ratio is examined for developing countries, where equity is the sum of FDI and portfolio equity liabilities. In bivariate regressions, only openness is significant but all variables are significantly positive in the multivariate regression, which has a good overall fit with an  $R^2$  of 0.75. In line with our theoretical priors, the mix of liabilities shifts from debt to equity in the case of richer, more open and larger countries.

The regression results in Tables 6-8 should be viewed as initial attempts to model the level and composition of net foreign asset positions. In future work, we plan to expand the set of regressors and investigate nonlinear specifications. The promising results from our “first cut” investigations give us confidence that this is a potentially fruitful line of inquiry.

## VI. CONCLUDING REMARKS

In this paper we have presented a data set on level and composition of external assets and liabilities for a sample of 66 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 stock data comparable to the external debt statistics for developing countries, and are not adjusted for the impact of cross-currency fluctuations. Estimates 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 seem to match existing stock data quite closely and they fill an important gap. Indeed, modern international macro-economics, with its emphasis on the intertemporal dimension, clearly needs comprehensive stock measures to supplement data on external debt and the flow data typically available through balance of payments statistics. We have focused in particular on estimating stocks of equity and FDI, given both their increasing importance and the paucity of data on their stocks.

Cross-sectional and time-series characterizations of these stocks provide some interesting stylized facts, that deserve 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 strongly 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 assets and lower FDI liabilities. We view these preliminary results as a promising start for an investigation of the determinants of countries' external wealth. Moreover, the impact of stocks of foreign assets and liabilities on macroeconomic behavior is an important question that has not been empirically explored. In ongoing work, we are investigating these important issues.



List of Countries

United States*	New Zealand*	Oman
United Kingdom*	South Africa	Saudi Arabia
Austria*	Argentina	Syrian republic
Belgium-Luxembourg*	Bolivia	Egypt
Denmark*	Brazil	Sri Lanka
France*	Chile	Taiwan province of China
Germany*	Colombia	India
Italy*	Costa Rica	Indonesia
Netherlands*	Dominican Republic	Korea
Norway*	Ecuador	Malaysia
Sweden*	El Salvador	Pakistan
Switzerland*	Guatemala	Philippines
Canada*	Mexico	Singapore
Japan*	Paraguay	Thailand
Finland*	Peru	Algeria
Greece*	Uruguay	Botswana
Iceland*	Venezuela	Côte d'Ivoire
Ireland*	Jamaica	Mauritius
Portugal*	Trinidad and Tobago	Morocco
Spain*	Israel	Zimbabwe
Turkey	Jordan	Tunisia
Australia*	Kuwait	China

Countries are ordered by IFS code. An asterisk indicates an industrial country.

### Measuring Initial Assets and Liabilities

Consider the cumulative value of the current account, given in equation (4), and set  $p=1970$  as the starting value for our calculations. The issue is what initial values to use for the various components of the net foreign asset position. Assume that  $EQ_{s-1} = KA_{s-1} = 0$  (a reasonable assumption given that equity flows were negligible before the 1980s and that all transfers were recorded in the current account under the previous balance of payments accounting methodology). In this case we can write:

$$CUMCA_0(p-1) = DEBTA_0(p-1) - DEBTL_0(p-1) + FDI_0(p-1) + FX_0(p-1) \quad (9)$$

Let  $NFA$  be the “true” net foreign asset position and let  $\epsilon = NFA - CUMCA - KA$  where  $\epsilon$  is a measurement error, which can be due, for example, to the existence of a nonzero foreign asset position at time 0 or to valuation changes. For developing countries, we typically have available a direct measure of gross external debt  $DEBTL_0(p-1) = DWB_{p-1}$  and of foreign exchange reserves  $FX_{p-1}$ , and a cumulative measure for FDI from year  $r \geq 0$  as a proxy for  $FDI_0(p-1)$  (the flows are cumulated on the 1967 stock for inward FDI). Hence we can write:

$$NFA_{p-1} = CUMCA_0(p-1) + \epsilon_{p-1} = DEBTA_0(p-1) - DWB_{p-1} + FDI_r(p-1) + FX_{p-1} + \epsilon_{p-1} \quad (10)$$

We therefore have one equation and 2 unknowns: the initial stock of assets held by the country abroad  $DEBTA_0(p-1)$  and the measurement error  $\epsilon$ . We set  $\epsilon = 0$  (we experimented with other hypotheses as well) and we thus obtain an initial value for  $DEBTA_0(p-1)$ .

From period  $p$  onwards we can track the evolution of some stocks directly (for example, reserves and gross external debt). Hence in order to obtain the net foreign asset position we need to correct CUMCA for valuation changes in foreign exchange reserves and external debt; this is discussed in the text in Section 2.C. The other issue is how to account for deviations between the flow of debt liabilities (corrected for the impact of valuation changes) and the change in the stock of debt. This is discussed in the text in Section 2.D.

For industrial countries, the determination of the initial net foreign asset position is described in Section IV. With regard to its composition, our measures of FDI and equity stocks are based on cumulative flows where the initial value is either determined by a stock estimate (if available), or by cumulative flows (if the data are available for a sufficiently long period prior to 1970) or, finally, in a few cases (equity stocks for Germany, Italy, Netherlands) by decumulating adjusted flows from the first available stock measure. For all countries for which IIP measures are not available in 1970 the initial net debt position is determined residually, as in equation (10). However, we lack an initial measure of gross external debt and we cannot therefore provide residual-based estimate of initial debt assets.

## Equity and Foreign Direct Investment Positions: Valuation Issues

### Stocks of Portfolio Equity

Stock measures are constructed based on cumulative equity flows. The flows of equity are taken from the IMF's International Financial Statistics and Balance of Payments Statistics. For *equity inflows*, 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 over its average during the year.

Let  $\Delta EQL$  be the equity inflow,  $EQL$  the corresponding stock,  $p^*$  ( $\bar{p}^*$ ) the end-of-year (average) stock price index in dollars for year  $t$ . The stock is calculated as follows:

$$EQL_t = EQL_{t-1} \frac{p_t^*}{\bar{p}_{t-1}^*} + \Delta EQL_t \frac{p_t^*}{\bar{p}_t^*} \quad (11)$$

A similar equation holds for *equity outflows*. The assumption is that all countries allocate their equity investment abroad in the same fashion, and that the composition of their portfolio reflects the Composite Index of world stock markets constructed by Morgan Stanley,  $p^{MS}$ .<sup>20</sup>

$$EQA_t = EQA_{t-1} \frac{p_t^{MS}}{\bar{p}_{t-1}^{MS}} + \Delta EQA_t \frac{p_t^{MS}}{\bar{p}_t^{MS}} \quad (12)$$

For the US, the United Kingdom and Japan we adjust the stock of equity held abroad by a composite index of world stock markets that excludes the "source" country.<sup>21</sup> For all other countries we use the overall composite index of world stock market prices. The degree of mismeasurement due to the inclusion of the source country is likely to be small, given both relative weights and the degree of co-movement in stock market values over the long run.

### Stock of Foreign Direct Investment

Estimates of the stock of FDI are based on cumulative flows. Data on the FDI flows are taken from the IMF's *IFS* (various issues). With regard to the initial value, direct stock measures were used if available for or prior to 1970: international investment positions (for

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<sup>20</sup>This assumption is admittedly crude but the absence of precise details on the foreign equity portfolios held by each country limits the choice of methodology. Note also that these adjusted cumulative flows track existing stock measures very closely.

<sup>21</sup> Monthly data are available from Morgan Stanley's website at <http://www.msdata.com>.

Canada, United Kingdom, United States), the stock data reported by Sinn (1990) (France, Netherlands, Portugal, Switzerland); and, for developing countries' inward FDI, the stock of industrial countries' investment in those countries for 1967 as reported in OECD (1972). When stock measures were unavailable, the stock of foreign-owned capital was assumed to be zero in years prior to the reporting of FDI flows. For the majority of those countries (mainly the remaining industrial countries) we obtained FDI flows dating back to the 1950s.

We discuss four alternative methodologies to estimate the stock of foreign direct investment assets and liabilities. Let  $\Delta FDI$  ( $L$ ) be the FDI outflow (inflow) on an accrual basis (including reinvested net profits). The first methodology provides a rough estimate of the stock of FDI evaluated at *historical cost*: it consists in the simple cumulation of flows:

$$\begin{aligned} FDI_t &= FDI_{t-1} + \Delta FDI_t \\ FDIL_t &= FDIL_{t-1} + \Delta FDIL_t \end{aligned} \quad (13)$$

The second methodology aims at capturing valuation changes in FDI investment on the basis of *replacement cost*. It is assumed that FDI is in the form of investment in some standardized "machinery" whose price in dollar terms follows the price of capital in the US. The stock value of inward FDI is therefore obtained by cumulating the dollar amount of yearly flows, adjusted for variations in the price of capital, under the assumption that profits are calculated net of taxation and depreciation. In this case the stock of foreign equity is given by:

$$\begin{aligned} FDIAR_t &= FDIAR_{t-1} (1 + \pi_t^k) + \Delta FDI_t \\ FDILR_t &= FDILR_{t-1} (1 + \pi_t^k) + \Delta FDIL_t \end{aligned} \quad (14)$$

where  $\pi^k$  is the rate of change of the price of capital in US dollars.<sup>22</sup> The stock of foreign capital equals cumulative FDI flows on an accrual basis, evaluated at today's prices.

The estimates presented so far are based on the implicit assumption that PPP holds for the price of capital goods: therefore, prices of investment goods measured in US dollars increase at the same rate, regardless of location. Our third estimation method assumes instead that capital goods are closer to nontraded goods. Under the (admittedly crude) assumption that the relative price of investment goods across countries follows relative CPIs, 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. That is,

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<sup>22</sup>The dollar price of foreign capital is taken to be the domestic investment deflator (measured in U.S. dollars). Results are analogous when using an index of world export prices instead of the price of capital as for inward FDI flows.

$$FDILH_t = FDILH_{t-1} \frac{rerus_t}{rerus_{t-1}} (1 + \pi_t^k) + \Delta FDIL_t \quad (15)$$

where *rerus* is the bilateral real exchange rate of the country 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 the trade pattern. With respect to the calculation of the stock of inward FDI, it involves 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 unit of measurement, the US dollar. Suppose, for example, that Italy invests only in Germany and that the D-mark appreciates vis-à-vis the US dollar between the end of the year *t-1* and the end of 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. In this case, 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 (again, disregarding trend increases in the prices of capital goods). Hence:

$$FDIAH_t = FDIAH_{t-1} \frac{rerpc_t}{rerpc_{t-1}} (1 + \pi_t^k) + \Delta FDIA_t \quad (16)$$

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

where *pc* stands for “partner countries”, *us* for United States, *cpi<sup>x</sup>* is the consumer price index of country *x* and *e<sub>s</sub><sup>p</sup>* is the dollar/partner countries’ nominal exchange rate. The term multiplying the lagged stock *CFDIA<sub>t-1</sub>* is one plus the change in the purchasing power of the basket of partner country currencies vis-à-vis the US dollar (which is the measurement unit) between the end of year *t* and the end of *t-1* times one plus the increase in the price of capital goods in the US.<sup>23</sup> *rerpc* is the ratio between the CPI-based real exchange rate of the country vis-à-vis the US and the CPI-based real effective exchange rate (vis-à-vis trading partners). It is immediate to check that the calculation yields the expression in (16).

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<sup>23</sup>Formally, the flow of foreign direct investment should be multiplied by the change in the purchasing power of the basket of partner country currencies vis-à-vis the US dollar between the end of the year (when the stock is evaluated) and the year average (at which the flow is measured). We have disregarded this adjustment, which makes no significant difference to our estimates.

The estimates of the stock of FDI according to this methodology can overstate the actual stock of FDI capital for two reasons. First, write-offs of existing capital are not taken into account. Second, in the presence of inflation, nominal depreciation allowances imply that part of reinvested profits are really offsetting real capital depreciation and should therefore not be counted as new capital. The inflation adjustment to the stock implies instead that each dollar of reinvested profits is calculated in 'real' terms. In order to address these problems, we have computed a fourth measure of FDI capital based on cumulative flows, based on the one above but without any correction for inflation in capital goods' prices:

$$\begin{aligned} FDIA_t^* &= FDIA_{t-1}^* \frac{rerpc_t}{rerpc_{t-1}} + \Delta FDIA_t \\ FDIL_t^* &= FDIL_{t-1}^* \frac{rerus_t}{rerus_{t-1}} + \Delta FDIL_t \end{aligned} \quad (17)$$

On average, this measure tracks direct measures of FDI capital better than the other cumulative flow measures. Indeed, the correlation between changes in the stock of direct investment and the adjusted flow, (as ratios to GDP) is high (around 0.8 on average).

Note finally that the estimates presented so far rely on the assumption that the current account is measured on an accrual basis, so that retained earnings are counted as investment income outflows in the current account and as new FDI in the capital account. Insofar as retained earnings are not recorded in the balance of payments, cumulative flows will instead tend to underestimate the existing stock of foreign-owned capital.

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