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Capital Flows to Developing Economies: Implications for Saving and Investment

THE CURRENCY CRISES that broke out in East Asia in mid-1997 have been followed by more than a year of tumult in international financial markets. These crises have had a serious impact on the emerging market economies, forcing many to raise domestic interest rates so as to stem an outflow of financial capital and prevent further exchange rate collapse. These interest rate increases have, in turn, depressed domestic economic activity. Not surprisingly, this severe financial instability has intensified discussions about the benefits and risks to developing economies from allowing capital to flow freely across national borders.[1]

For many developing countries, the ability to draw upon an international pool of financial capital offers large potential benefits. Low levels of capital per worker in these countries have long held output down. Net foreign resource inflows—current account deficits—can augment private saving and help these countries reach higher rates of capital accumulation and growth. Access to international capital markets provides the means to finance those resource flows. Some types of foreign capital inflows, principally foreign direct investment (FDI), may also facilitate the transfer of

1. Cardoso and Dornbusch (1989) and Obstfeld (1999) provide overviews of the academic literature on capital flows to developing countries. Dooley (1996) surveys work on capital controls. Eichengreen (1999) discusses current policy options.

managerial and technological know-how.[2] Portfolio investment and foreign bank lending are seen as adding to the depth and breadth of domestic financial markets. Some proponents have gone on to argue that, by increasing the rewards for good policies and the penalties for bad policies, the free flow of capital across borders promotes more disciplined macroeconomic policies and reduces the frequency of policy errors.[3] By the mid-1990s, growing support for open financial markets had led some officials to suggest amending the articles of the International Monetary Fund (IMF) to place capital account convertibility on the same level of desirability as a convertible current account.[4] Some analysts reason that the obvious benefits of open trade in goods and services create a presumption of positive net benefits from open cross-border trade in financial instruments as well.

On the other hand, opening domestic financial markets to international transactions creates added risks, as evidenced by a string of recent currency crises, particularly in developing countries. These crises have most often been blamed on mistaken macroeconomic policies in the affected countries, or what are characterized as bad fundamentals. But the recent crises in Latin America and East Asia, in countries with reasonably successful policy regimes, have called attention to the inherent instability of financial markets and the risks that cross-border financial transactions can pose for countries with relatively unsophisticated financial systems and weak regulatory oversight. Today's crises recall the bank runs and financial panics that plagued the U.S. financial system in the nineteenth century, in the sense that they are triggered by liquidity problems, as countries get caught in a mismatch of maturities between their foreign assets and liabilities. In addition, international financial transactions involve hazards not present in domestic markets, especially the risk of exchange rate changes. And when markets are stressed, governments are inevitably drawn in by their commitment to a fixed exchange rate, when one exists, or by the societal consequences of large swings in currency values.

Most of the current policy discussion implicitly accepts the notion that open capital markets are highly beneficial, and proposals for reform have

2. Recent studies emphasizing the potential role of FDI in raising growth through technological diffusion include Borensztein and others (1998) and Grossman and Helpman (1991, chapters 11 and 12). See also Moran (1998) for a general discussion of FDI.

3. For more discussion of the potential benefits, see Eatwell (1996) and Obstfeld (1998).

4. Fischer and others (1998) provide a useful discussion of this issue.

been directed toward reducing the risks of financial instability and crises so that capital flows can continue unabated. But few resources have been devoted to a systematic evaluation of the benefits of open capital markets. The benefits to foreign investors seem quite evident and stem largely from higher expected long-term rates of return and opportunities for risk diversification. Returns on investments in emerging markets show a low correlation with returns on a global index, and they often exhibit low correlations with one another as well.[5] Much less is known about the benefits to the economies receiving foreign capital inflows. In particular, little is known about the extent to which the promise of expanded resources for investment and growth has been realized. In part this is due to the inherent difficulties in constructing counterfactual outcomes—what would happen in the absence of such inflows.

There is also a severe shortage of historical data. The international financial market largely disappeared with the outbreak of World War I, and in contrast to the current enthusiasm for the benefits of capital inflows, the postwar reconstruction of the industrial economies was conducted within regimes of tight capital controls. Most countries, concerned not so much with potential instability as with the pressures for currency appreciation that capital inflows would bring, prohibited all but direct investment until the mid-1970s. The free international flow of financial capital became feasible only as countries moved away from the Bretton Woods system of fixed exchange rates. Until then, countries maintained control over external financial transactions to allow some freedom for monetary policy to address domestic concerns. Even as late as 1980, only six industrial countries were judged as having open financial markets: Canada, Germany, the Netherlands, Switzerland, the United Kingdom, and the United States.[6] Most financial flows to developing countries, other than direct investment, took the form of government borrowing from official organizations or from commercial banks in the industrial economies. Large-scale flows of portfolio capital to developing economies are primarily a phenomenon of the 1990s.

This study uses regression analysis to evaluate the implications of capital inflows for recipient countries. We examine a panel data set consist-

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5. World Bank (1997, pp. 89–91). From the investor perspective the puzzle is why there is so little international diversification of portfolios (French and Poterba, 1991).

6. Frankel (1986). However, in earlier years some countries did allow capital inflows for specific projects, such as the development of Norway's oil reserves in the mid-1970s.

ing of balance of payments and domestic investment and saving data in fifty-eight developing countries for each of the years 1978–95. We are concerned with the uses made of financial capital inflows: do they finance additional inflows of real resources (a current account deficit), or are they offset by compensating financial transactions such as increased reserves or capital outflows? We also ask, to the extent that there is a resource transfer, how is it divided between increased investment and added consumption? Before addressing these questions, however, we first review recent trends in the growth of international financial markets and in the extent of involvement of developing countries. We also show the different types of capital inflows (FDI, portfolio investment, and other finance) and how these inflows are allocated among alternative uses in the aggregate.

Recent Trends

Our data on capital flows are drawn largely from the balance of payments files of the IMF. The fifth edition of the IMF's *Balance of Payments Manual* provides for the separate reporting of financial capital inflows (which add to the receiving country's liabilities) and outflows (which add to its assets). Both are reported net of repayments.[7] One advantage of these data for our purposes is that they distinguish among three types of capital flows: FDI, portfolio investment, and other financial flows (primarily bank loans). This lets us study, for example, whether FDI is "different" from other inflows.[8] A second advantage is that the consistent accounting framework enables us to relate capital inflows to other components of the balance of payments: in particular, the current account, capital outflows, and reserve accumulation.[9] Foreign aid (bilateral and multilateral) is largely

7. IMF (1993).

8. Claessens, Dooley, and Warner (1995) argue that FDI is indistinguishable from other capital flows in terms of its volatility and predictability. Sarno and Taylor (1997), on the other hand, find that FDI is more persistent than other components of capital flows.

9. Although we do not use them in this study, we note that the World Bank has developed a second source of data in its annual *Global Development Finance* (GDF). That report provides detailed information on the debt stocks of developing countries, but it excludes asset transactions of the balance of payments, and it includes only those financial liabilities that are denominated in foreign currencies. Thus it includes borrowing in eurocurrency markets but excludes bond purchases by foreign investors in the domestic market. The GDF data are very similar to the balance of payments data in the aggregate, but there are substantial differences at the level of individual countries.

classified as a transfer in the balance of payments and excluded from capital inflows, but some forms of concessionary finance are included.

The following identity provides a simplified overview of the different types of transactions in the balance of payments accounts:

(1) $$0 = (CA + KA) + FINI + FINO + ERR + RES,$$

where
CA = current account balance
KA = capital account balance
$FINI$ = financial inflows
$FINO$ = financial outflows
ERR = errors and omissions, and
RES = reserves and related items.

As usual, sources of foreign exchange, such as financial inflows and exports, are denoted as positive (credits), whereas uses of foreign exchange, such as financial outflows and imports, are negative (debits). This identity is based on the redesign in the fifth edition of the *Balance of Payments Manual,* which unfortunately uses somewhat confusing terminology. A newly created category, which primarily includes capital transfers and transactions related to the purchase and sale of used equipment, is called the capital account. This new account is zero or small for the countries in our sample, and for simplicity we have combined it with the current account. Thus we have a current account, a financial account, and a reserve account. What used to be referred to as the capital account now corresponds most closely to the sum of the financial account and the reserve account. Within this simplified framework, inflows of financial capital can be set aside as reserves, used to finance current account deficits, or offset by financial capital outflows.

Most countries have revised their historical accounts to conform to the new format, and with minor extensions we have been able to put together a complete data set. The period includes five years prior to the 1982 debt crisis. Unfortunately, delayed publication of the full balance of payments accounts for some countries made it infeasible to extend the period beyond 1995. The sample of countries is drawn from our earlier study that analyzed patterns of economic growth using data on GDP and investment.[10]

10. Collins and Bosworth (1996).

The sample (listed in appendix table A1) covers nearly all of Latin America and Asia as well as many countries in Africa.[11] Singapore, Hong Kong, and Panama are excluded from the analysis because their role as financial centers involves atypically large capital outflows and inflows and leads to some double counting of inflows at the regional level. For some purposes, we also include the twenty-three high-income countries of the Organization for Economic Cooperation and Development (OECD).

As the top panel of figure 1 shows, total international flows of capital expanded fourfold between 1978 and 1995. However, this trend is completely dominated by the high-income OECD countries, which received about 85 percent of the total. Furthermore, the nominal increase shown significantly overstates the growth in relative importance of these inflows. The bottom panel of figure 1 shows that, as a share of GDP, total capital inflows and the portion going to industrial countries were roughly unchanged over the two decades.

A key point that emerges from these data is that the very rapid growth of capital flows to developing countries since 1988 is largely just a recovery from the severely depressed flows following the 1982 debt crisis. Flows to developing economies were about the same percentage of their output in 1995 as during 1978–81.[12] Furthermore, at 5 percent of GDP, capital inflows to the developing economies in 1995 are about the same proportion as flows to industrial countries, despite a far less sophisticated infrastructure of financial markets and institutions.

Capital flows to developing economies are concentrated among a few countries in Asia and Latin America. Five countries (in descending order, China, Mexico, Korea, Thailand, and Brazil) accounted for nearly two-thirds of financial flows to developing countries in the 1990–95 period; the eighteen countries identified as emerging markets by J.P. Morgan & Company accounted for 90 percent of the total.[13] It is interesting to ask how total flows to developing economies have been used. One might assume

11. In 1990 these countries together represented about 95 percent of gross world product excluding the high-income member countries of the Organization for Economic Cooperation and Development (OECD) and the transition economies of Europe and Central Asia.

12. Bank lending to some developing countries, especially in Latin America, grew rapidly between 1973 and 1981, as efforts were made to encourage those countries to generate current account deficits as offsets to the large surpluses of the oil-producing countries.

13. Their list of emerging markets also includes Singapore, which, as already noted, is excluded from the eighteen. See appendix table A1 for a complete list and appendix table A3 for additional information about flows to individual countries.

Figure 1. Capital Inflows to Industrial and Developing Countries, 1978–95[a]

Billions of U.S. dollars
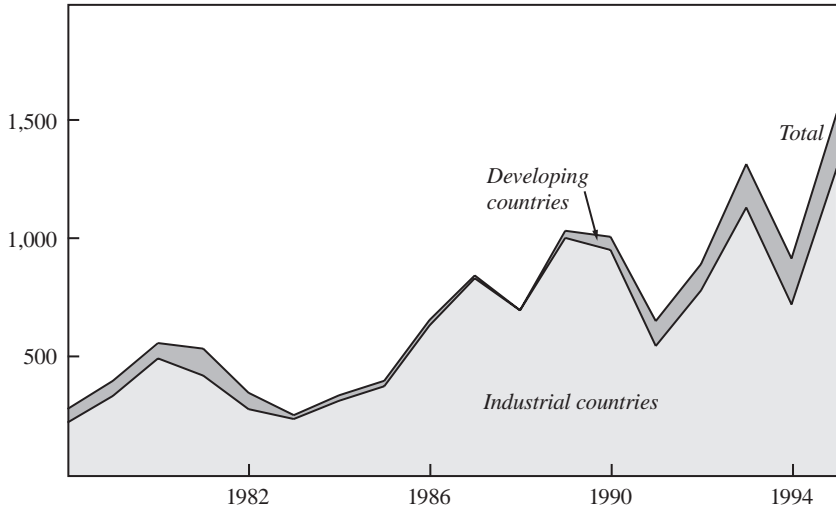
Percent of GDP
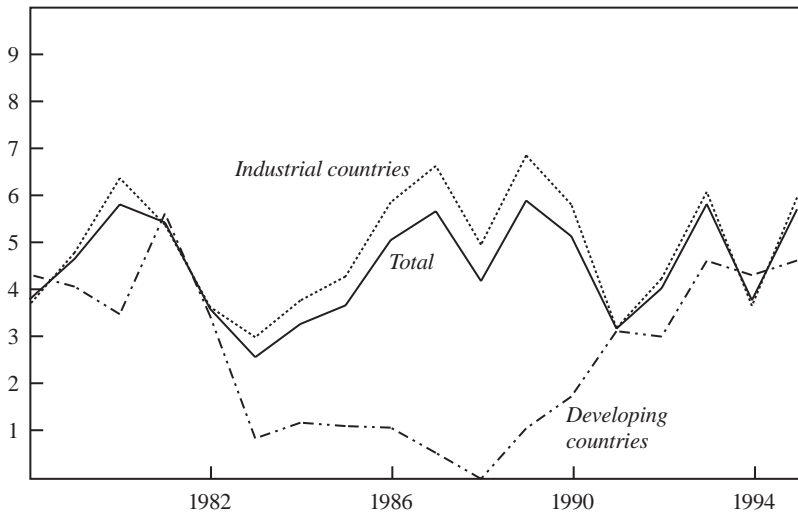
Source: IMF (1998b) and authors' calculations.

a. Industrial countries are OECD members since 1978, except Luxembourg. Developing countries are those listed in appendix table A1 plus Guyana, Mozambique, Nicaragua, Panama, Singapore, Sudan, and Zaire.

that these flows have financed larger current account deficits, with an emphasis on investment goods, but the actual pattern is more complex. As the bottom part of table 1 shows, only about half of the cumulative inflows have been associated with increased current account deficits, and that proportion has declined in the 1990s. Roughly a third of the inflows have been funneled into reserve assets. The need to hold reserves is a significant concern in evaluating the net benefits of financial inflows, because the return on reserves is typically very low. To offset this low return would require a high private return on the remaining inflows or substantial net externalities. In the aggregate, a third of the inflows have been offset by financial outflows, but that percentage is strongly influenced by a few large countries that allow their residents to transfer capital freely. Errors and omissions in the balance of payments are frequently associated with capital flight. Like capital outflows, they were very large in the period after the Latin American debt crisis. Most recently, the errors have been large for China. Exceptional financing transactions and IMF credits are included in total reserve accumulation (*RES* in equation 1).[14] Such transactions could be classified as capital inflows, but because they are frequently associated with crises, debt forgiveness, and debt restructuring, they are negatively correlated with other inflows. During the 1982–89 period, exceptional financing transactions averaged 116 percent of total capital inflows.

As already noted, the data also enable us to disaggregate total capital flows into three types: FDI, portfolio capital, and other liabilities (mostly loans). As the top portion of table 1 shows, the composition of capital flows to developing countries has shifted significantly toward FDI and away from loans. The 1990s have also witnessed an explosive growth in portfolio capital (equities and bonds), which was practically nonexistent in prior decades.

The pattern of inflows differs markedly by region (see appendix table A2). Prior to 1982, bank loans either to governments or to other banks were the dominant type of international financial transaction in Latin America. After the 1982 crisis, this region largely avoided or could not obtain bank loans and focused instead on repayment and conversion of the old loans to marketable equities. Hence more recent net loan activity has been consistently negative, and growth in capital inflows has instead

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14. Exceptional financing refers to transactions undertaken by the authorities to finance balance of payments needs, including external borrowing, payment arrears, and debt forgiveness.

Table 1. Capital Inflows to Developing Countries by Type and Use, 1978–95[a]

Units as indicated

Category	1978–95	1978–81	1982–89	1990–95
	Billions of U.S. dollars			
By type of inflow				
Total	71	68	24	135
Foreign direct investment	26	9	13	54
Portfolio investment	19	2	2	52
Loans	26	57	9	29
	Percent of total inflows			
By use of inflow				
Current account financing	53	67	88	40
Capital outflows	34	17	65	32
Reserves and related items	2	6	–75	19
Reserve assets	34	13	46	38
IMF credits[b]	–2	–3	–5	–1
Exceptional financing[c]	–30	–5	–116	–18
Errors and omissions[d]	11	11	21	9

Source: IMF (1998b) and authors' calculations.

a. Figures are averages for the period. Percentages may not sum to 100 because of rounding. The fifty-eight countries in the sample are listed in appendix table A1.

b. Use of Fund credit and loans. A negative value indicates that a country is a net borrower.

c. Transactions undertaken by a country's authorities to finance balance of payments shortfalls.

d. The statistical discrepancy between outflows and inflows as reported by different countries.

been concentrated in FDI and portfolio capital. East Asia experienced an even more rapid growth in FDI, but lending there remains more important than portfolio capital. Indeed, Asia accounts for most of the growth in bank loans to developing countries.

Interestingly, the three types of capital inflows (FDI, portfolio investment, and loans) are not significantly correlated with one another over time or across countries. That is, there is little tendency for countries with large amounts of portfolio capital or loans to receive correspondingly large amounts of FDI. China, the largest developing-country recipient of FDI in the 1990s, obtained very little portfolio capital or lending, while Brazil, the largest recipient of portfolio capital among developing countries, actually reduced its reliance on loans and maintained a very restrictive policy toward FDI. The lack of correlation is shown more formally in table 2, the top half of which reports the correlation coefficients for the full set of fifty-eight countries and eighteen years. The first set of correlations in each half of the table pools the data and treats all observations as equivalent. The second set averages the data for each country over time and examines the correlations across the fifty-eight country means. The third set

Table 2. Correlations between Types of Financial Flow for Developing Countries, 1978–95[a]

Grouping[b]	Foreign direct investment	Portfolio investment	Loans
		Full sample[c]	
Total			
Foreign direct investment	1.00		
Portfolio investment	0.01	1.00	
Loans	0.00	0.00	1.00
Cross-country correlations			
Foreign direct investment	1.00		
Portfolio investment	0.13	1.00	
Loans	0.16	0.08	1.00
Cross-period correlations			
Foreign direct investment	1.00		
Portfolio investment	0.04	1.00	
Loans	0.09*	0.02	1.00
		Emerging markets[d]	
Total			
Foreign direct investment	1.00		
Portfolio investment	0.06	1.00	
Loans	0.01	0.10	1.00
Cross-country correlations			
Foreign direct investment	1.00		
Portfolio investment	0.31	1.00	
Loans	0.02	0.32	1.00
Cross-period correlations			
Foreign direct investment	1.00		
Portfolio investment	0.00	1.00	
Loans	0.03	0.08	1.00

Source: IMF (1998b) and authors' calculations.

a. An asterisk denotes significance at the 5 percent level.

b. See text for descriptions of the correlations.

c. The full sample consists of the fifty-eight developing countries listed in appendix table A1 (1,031 observations).

d. The emerging markets subsample is taken from Morgan Guaranty's (1998) list of nineteen emerging markets. Singapore was excluded because of its role as a money center, leaving 18 countries and 324 observations.

subtracts the country-specific effects to focus on the time dimension. The correlations are all low. Indeed, the only statistically significant one (that between FDI and loans in the time dimension) is just 0.09.

The bottom half of the table reports parallel correlations for the subset of eighteen emerging market countries. By eliminating most of the countries with no portfolio capital inflows, this subsample may be more representative of countries with active linkages to external financial markets. There is some modest increase in the correlation between portfolio capi-

tal and other inflows in the cross-country dimension, but none of the coefficients is statistically significant. Perhaps surprisingly, there remains little evidence of complementarity between different types of capital inflows.

Capital Inflows and the Resource Transfer

For developing economies, the primary benefits of capital inflows are the opportunities they provide to accelerate economic growth and increase current consumption. Such inflows can raise growth rates by supplementing domestic saving, thereby raising the rate of capital accumulation. They may also accelerate growth through the transfer of technology and management skills that accompanies direct investment. Alternatively, capital inflows may be used to raise current consumption, which may reduce saving. Indeed, there is a long-standing interest in the extent to which the resource inflows associated with current account deficits are invested or consumed.[15]

In this section we use regression analysis to examine the links among capital inflows, investment, and saving in our sample of countries.[16] Although our analysis focuses on capital inflows and the two components of the identity that define the current account, it is important to reiterate a point already made: capital inflows need not be associated with a resource transfer. Indeed, significant shares of the recent flows to developing countries have been offset by reserve accumulation, capital outflows, or errors and omissions.

Our work differs from other such empirical studies in one or more of the following dimensions. We recognize that capital inflows are likely to be influenced by domestic economic conditions, and we use an instrumental variable estimator to allow for this endogeneity. We consider possible differences among types of inflows and look at both investment and saving. We focus on experiences within countries over time, instead of only on differences among countries. Finally, our specifications include a variety of

15. Obstfeld (1998) summarizes this literature, much of which focuses on the implications of foreign aid, which we do not examine here.

16. Other, similar studies have taken a different approach or asked a somewhat different question. Eatwell (1996) compares investment and growth rates during periods identified as having limited versus high international capital mobility. Rodrik (1998) examines the effects of capital account liberalization, thus focusing on the implications of changes in policy, and not on the implications of capital inflows themselves.

factors likely to influence the shares of GDP devoted to saving and investment, and we allow for unobserved country characteristics.[17]

Determinants of Investment and Saving

Ideally, we would like to embed the empirical estimates of the effects of capital inflows within the framework of a realistic theoretical model. One possibility is to rely on a neoclassical model of intertemporal utility maximization by a representative consumer or planner, subject to the constraint of capital accumulation within a neoclassical production function. For an economy with constrained access to international capital markets, foreign resource inflows can be viewed as an income transfer that can be either consumed or invested. Maurice Obstfeld outlines such a model in a recent paper that extends earlier models of the effects of foreign aid transfers.[18] In these models a foreign resource inflow is no different from any other increase in income. Unless the rate of intertemporal substitution is very high, the representative agent will respond to a permanent resource inflow with a large increase in consumption. Because the inflow affects income as well as consumption, saving may rise or fall. If the resource transfer is temporary or takes the form of a loan that must be repaid, the consumption effect is somewhat damped, but it is still likely to exceed the effect on investment. Within such models, resource inflows may raise utility primarily by smoothing consumption rather than by raising investment and long-run growth.

These utility-based models miss some essential features of foreign capital inflows. The assumption of a single representative agent assumes a degree of capital market development—equalization of lending and borrowing rates—that does not exist in most developing economies. Also, foreign suppliers of credit may not be indifferent to its allocation between consumption and investment. With FDI, the foreign investor is likely to face different investment options than the domestic firm, because of established links to foreign markets or access to technology. Even in the case of foreign loans, lenders are likely to require collateral.

17. For example, Borensztein and others (1998) and Gruben and McLeod (1998) both used pooled data sets that do not focus on the time dimension. The first study examines the links between FDI and investment and growth but does not adjust for endogeneity. The second uses annual data to study the effects of FDI versus portfolio equity and short- versus long-term capital inflows on saving and growth.

18. Obstfeld (1998). See also Schmidt-Hebbel and Servén (1995) and Eaton (1989).

More disaggregated theoretical models allow for a separation of the determinants of investment and saving, with explicit use of interest rates as equilibrating mechanisms. But their extensive data requirements make these models ill suited for estimation among developing economies. Instead, they have been calibrated to match the major stylized facts and used to simulate policy changes.

We have settled for a less structured approach based on existing empirical research on the determinants of investment and saving in developing economies. The empirical literature on investment reflects three differing views of investment behavior. The oldest model, the accelerator theory, emphasizes the proportionality between the stock of capital and output and ties investment to the rate of growth of output. Early versions of the neoclassical model expand on the accelerator model by relating the optimal stock of capital to the relative cost of capital as well as the level of output. The cost of capital is a function of the price of capital goods, taxes, the rate of interest, and depreciation. More recent versions, associated with Tobin, Brainard, and others, emphasize the relationship between the market value of additional investment and its replacement costs, the "marginal" *q* ratio, as a determinant of investment.[19] The use of *q* is particularly compatible with the current emphasis on forward-looking rational expectations, and with the incorporation of adjustment costs it yields a well-defined investment relationship.

Efforts to validate the *q* approach with historical data have had limited success, but its strong theoretical underpinnings have made it popular for macroeconomic simulation models.[20] For our purposes, the formulation raises a host of empirical problems: most important, we lack measures of market valuation in developing economies. Most of the empirical studies that focus on developing economies have also lacked the measures of taxes and interest rates needed to compute accurate measures of the effective cost of capital as called for by the neoclassical model.

In practice, nearly all of the empirical research on investment in developing economies has been driven by rather ad hoc approaches that are strongly influenced by the availability of data. A 1993 World Bank study surveyed a large number of these studies.[21] They find that output growth,

19. See Lucas (1967), Tobin (1969), and Treadway (1969).
20. See, for example, McKibbin and Sachs (1991) and Laxton and others (1998).
21. Servén and Solimano (1993).

terms-of-trade improvements, and reductions in external debt all have strong, positive influences on investment.

A similar dichotomy between theory and empirical analysis arises with respect to saving. Most of the theoretical literature emphasizes a life-cycle model where consumption is determined by the maximization of intertemporal utility subject to a wealth constraint: consumption is proportionate to the annuitized value of nonhuman and human wealth. Empirically, however, there appears to be much less consumption smoothing than these models predict—or an excessive sensitivity to current income fluctuations. Furthermore, sustained increases in income growth appear to have a positive effect on saving, rather than the negative relationship suggested by the theory. In response, borrowing constraints are often used to account for the importance of current income. Similarly, the existence of borrowing constraints in international capital markets is used to argue that capital inflows will reduce national saving.

A more recent World Bank study surveys many of the empirical analyses of saving behavior in developing countries.[22] The authors find important parallels between the determinants of saving and investment: like those for investment, national saving rates have a robust positive relationship with income growth and improvements in the terms of trade. Other variables that usually have significantly negative effects on saving are capital inflows, external debt, and dependency ratios (the proportion of the population that is old or very young). The results for other variables, such as the interest rate and financial market depth, tend to be ambiguous.

Our review of these earlier studies of investment and saving leads us to formulate both saving and investment as functions of capital inflows, output growth, and changes in the terms of trade. There may be a role for additional country characteristics, such as external indebtedness and, in the case of saving, for dependency ratios. However, although these variables vary considerably across countries, they have limited variation within countries over time.

ESTIMATION WITH PANEL DATA. Given fifty-eight countries and up to seventeen years, our data set provides us with a total of 972 observations.[23] Its panel nature has the important advantage of allowing us to control for

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22. Loayza, Schmidt-Hebbel, and Servén (1998). See also Masson, Bayoumi, and Samiei (1995).

23. Missing values for some variables and the need to allow for lagged variables reduce the sample size from the full potential of 986 observations.

country-specific effects when estimating investment and saving relationships. In contrast, many previous studies have pooled their data across countries and over time, implicitly assuming that country-specific effects are either absent or uncorrelated with the regressors. It is well known that such correlation will bias coefficient estimates.[24] Fixed-effects estimation enables us to focus on relationships within countries over time. As discussed above, this is the dimension of the data set that we wish to emphasize.

Thus we use the following specification:

$$(2) \qquad (I/Y)_{it} = \gamma_i + \beta X_{it} + \nu_{it,} \text{ and}$$
$$(3) \qquad (S/Y)_{it} = \alpha_i + \delta X_{it} + \varepsilon_{it},$$

where $i = 1, \ldots, 58$ and $t = 1, \ldots, 17$; (I/Y) and (S/Y) are the percentages of GDP devoted to investment and saving, respectively; and X_{it} denotes several explanatory variables that vary across countries and over time. First, we include either the total capital inflow, expressed as a percentage of GDP (*FINI/Y*), or its three components (*FDI/Y, PORT/Y,* and *LOANS/Y*). Second, we include the rate of real GDP growth with one- and two-year lags (G_{-1} and G_{-2}). Finally, *DTOT* is the change in the terms-of-trade index. Country-specific effects are denoted by γ_i and α_i. Given their limited variation over time, other variables such as the age structure of the population and external indebtedness will be reflected in these terms. The empirical analysis measures saving as the sum of investment and the current account balance. Thus the impact of a change in "*X*" on the real resource transfer (the current account deficit) is simply $(\beta - \delta)$.

THE ENDOGENEITY OF CAPITAL INFLOWS. Just as investment and saving may depend on capital inflows, so too the capital inflow a country receives is likely to depend on domestic economic activity.[25] This two-way interaction creates an endogeneity that may lead to biased coefficient estimates when capital inflows are used as an explanatory variable. However, the direction of this bias is unclear. A domestic shock that raises the return to capital may increase both capital inflows and investment. This would tend to bias the coefficient on capital inflows in an investment equation upward. In contrast, consider a domestic policy change that raises interest

24. The studies by Borensztein and others (1998) and Gruben and McLeod (1998) both relied on pooled data sets.
25. The endogeneity issue is discussed more fully in Dooley, Frankel, and Mathieson (1987).

rates. This may be expected both to increase the flow of capital into the country and to reduce domestic investment, tending to induce a negative correlation. Similarly, errors in the measurement of capital inflows would tend to bias the coefficient estimate downward.

To uncover the effect of capital inflows on saving and investment, we use instrumental variables to isolate the flows that are related to exogenous factors. Of particular interest are developments in the global financial markets that alter the pool of capital available to developing countries, since these can be interpreted as changes in developing countries' access to the international market. Unlike shocks to domestic demand for capital inflows, external supply shocks provide an opportunity to identify the underlying relationships of interest between capital inflows and domestic investment and saving.

We turned to the literature on determinants of capital inflows to develop our instruments. However, the empirical literature here is limited. Because of the difficulty of modeling capital inflows, most macroeconomic simulation models specify outcomes in terms of interest rate parity conditions rather than in terms of the capital flows that are part of the process. Those parity conditions may be appropriate for the major industrial economies, but they are of doubtful value for developing countries with their infant financial markets. Unfortunately, the interest rate and rate-of-return data that are critical for a fully articulated model of capital flows are available for only a small subset of developing economies and, when available, may be distorted by sharply changing investor perceptions of risk.

We have relied heavily on a study of financial inflows and their determinants by Calvo, Leiderman, and Reinhart that documented a major role for external factors.[26] To measure these factors, their vector autoregressive (VAR) analysis extracted the first two principal components of nine measures of interest rates and cyclical conditions in the United States. But even their empirical work focused on reserves and real exchange rates rather than capital inflows per se.

As measures of exogenous external factors to use as instruments, we experimented with U.S. interest rates and deviations of real U.S. GDP from trend, as suggested by Calvo, Leiderman, and Reinhart.[27] Although each instrument was statistically significant by itself, both were dominated by a measure of total gross capital flows to the developing economies in

26. Calvo, Leiderman, and Reinhart (1993). See also Calvo and Reinhart (1996).
27. Calvo, Leiderman, and Reinhart (1993, 1996).

our sample. This variable should reflect a broader range of supply-side factors than just economic conditions in the United States and is largely independent of economic conditions in any one developing economy.[28] Whereas this instrument is identical for each country, our other instruments vary across countries. One of these is the IMF indicator of the presence or absence of controls on financial account transactions.[29] Additional instruments included the change in the terms of trade, the prior year's capital inflows, and the lagged change in GDP—all variables that are included in the equations for saving and investment. Fixed-effects estimation was used in our first-stage regressions. As stated above, this procedure enables us to focus on the relatively permanent component of capital inflows and on those inflows associated with changes in external supply conditions.

EMPIRICAL RESULTS. We begin by focusing on total financial inflows. Regressions relating those inflows to rates of investment and saving are reported in table 3. The ordinary least-squares (OLS) estimates in the top left panel show a significant role for financial inflows in both the investment and the saving equations: about 20 percent of the inflow goes into higher investment, and about 14 percent is reflected in increased consumption. On average, 35 percent of the capital inflow is used to finance resource transfers through the current account. This implies a somewhat smaller diversion of the inflow into other offsetting financial transactions than suggested by the decomposition in table 1. As expected, output growth and variations in the terms of trade account for a large proportion of the variation in rates of investment and saving.

The top right panel of table 3 presents the results of instrumental variable (IV) estimations using the full sample.[30] IV estimation substantially increases the effect of capital inflows on investment: the coefficient rises from 0.20 in the OLS regression to 0.52. However, there is no significant

28. The variable is the cumulative sum of the capital flows divided by the cumulative sum of the GDPs, both expressed in U.S. dollars. There is considerable variation among countries in the behavior of investment, saving, and capital inflows. For example, the correlation coefficient between the individual-country investment rates and the fifty-eight-country aggregate was only 0.25, and that for capital inflows was 0.20. In any case, the choice of instruments had little or no significant effect on the results reported in tables 3 and 4.

29. IMF (1998b).

30. The first-stage estimates account for 42 percent of the variation in the financial inflow, with large roles for the aggregate flow to developing countries, the lagged inflow, and the lagged change in GDP.

Table 3. Effects of Aggregate Financial Flows on Investment, Saving, and the Current Account in Developing Countries, 1979–95[a]

Independent variable	OLS regressions			Instrumental variable regressions[b]		
	Investment	Saving	Current account[c]	Investment	Saving	Current account[c]
Full sample						
Total financial flows	0.20 (8.6)	-0.14 (4.5)	-0.35	0.52 (11.2)	-0.17 (2.6)	-0.69
Change in terms of trade	0.01 (1.9)	0.07 (6.6)	0.05	0.01 (2.0)	0.07 (6.6)	0.05
Change in GDP, one lag	0.18 (7.7)	0.15 (4.9)	-0.02	0.12 (5.1)	0.16 (4.8)	0.04
Change in GDP, two lags	0.20 (8.3)	0.21 (6.4)	0.01	0.18 (0.0)	0.21 (6.2)	0.03
Adjusted R^2	0.77	0.74		0.78	0.73	
Emerging markets						
Total financial flows	0.27 (6.5)	-0.02 (0.3)	-0.29	0.47 (5.9)	-0.07 (0.7)	-0.53
Change in terms of trade	0.00 (0.2)	0.07 (3.8)	0.07	0.00 (0.3)	0.07 (3.8)	0.07
Change in GDP, one lag	0.20 (4.3)	0.07 (1.3)	-0.12	0.17 (3.6)	0.08 (1.4)	-0.09
Change in GDP, two lags	0.23 (5.0)	0.16 (2.7)	-0.07	0.21 (4.4)	0.17 (2.8)	-0.04
Adjusted R^2	0.74	0.68		0.74	0.68	

Source: Authors' regressions based on IMF (1998a, 1998b) and World Bank (1998).

a. Regressions are based on annual data in percent of GDP. The full sample and the emerging markets sample are as described in the notes to table 2. In the full sample, the OLS regressions contain 972 observations and the instrumental variable regressions 970. In the emerging markets sample, the OLS regressions contain 306 observations and the instrumental variable regressions 305. *t*-statistics are in parentheses.

b. The following variables were used as instruments: total inflows to sixty-one developing countries; the one-year-lagged endogenous variable; the one-year-lagged percent change in GDP; the change in the terms of trade; and a dummy variable for whether a country had capital controls.

c. Computed as saving minus investment.

change in the saving relationship. Thus the estimated resource transfer induced by a capital inflow increases to 69 percent. The remaining 31 percent of the inflow is absorbed by reserve accumulation and capital outflows. The difference between the IV and the OLS estimates may reflect endogeneity bias, as discussed above. But it could also reflect extreme values in measured capital inflows that are not closely related to investment and are similar to measurement error. In support of the latter interpretation, the predicted values from the first-stage estimate of capital inflows have a notably smaller variance than the original data.

The results for the subsample of emerging market economies, shown in the lower panels of table 3, are similar to those for the entire sample. OLS estimation yields a positive, and slightly larger, effect of capital inflows on investment. The impact of foreign inflows on the saving rate, although negative, is small and insignificant. Again, the shift from the OLS to the IV method results in a sharply increased coefficient on financial inflows in the investment equation, but the impact on saving remains insignificant. These results for total financial flows are also robust with respect to other changes in the sample, such as a division of the countries by region or a focus on the more recent years.

Table 4 presents a more disaggregated model of the relationships, with capital flows divided into three types: FDI, portfolio investment, and loans. Only the IV results are reported. However, the reported regressions use actual values of portfolio inflows because we were unable to obtain useful first-stage estimates for this component. Several points emerge from the estimates. First, the results show substantial differences by type in the effects of capital inflows on investment. FDI has the strongest relationship, with an estimated coefficient close to one. Portfolio inflows have the smallest and least significant relationship, and loans are in between. This finding is particularly evident for the emerging market economies that account for the bulk of portfolio capital inflows. It, too, is robust to a variety of different specifications.

Second, the three types of financial inflows also appear to have sharply different implications for the current account and therefore for saving. In particular, we find a strikingly large positive coefficient on FDI on saving.[31] Thus FDI has a large positive effect on both investment and saving, implying no net deterioration of the current account. Instead, all of the

31. Gruben and McLeod (1998) also find a positive effect of FDI on saving.

Table 4. Effects of Disaggregate Financial Flows on Investment, Saving, and the Current Account in Developing Countries, 1979–95[a]

Independent variable	Investment	Saving	Current account[b]
	Full sample		
Foreign direct investment	0.81	0.77	–0.05
	(4.4)	(3.0)	
Portfolio investment	0.14	–0.01	–0.16
	(1.1)	(0.1)	
Loans	0.50	–0.22	–0.72
	(10.3)	(3.2)	
Change in terms of trade	0.01	0.06	0.05
	(1.9)	(6.3)	
Change in GDP, one lag	0.11	0.13	0.01
	(4.7)	(3.8)	
Change in GDP, two lags	0.17	0.21	0.04
	(7.0)	(6.1)	
Adjusted R^2	0.78	0.74	
	Emerging markets		
Foreign direct investment	0.90	0.87	–0.03
	(4.0)	(3.1)	
Portfolio investment	0.15	–0.17	–0.33
	(0.9)	(0.8)	
Loans	0.44	–0.12	–0.56
	(5.7)	(1.3)	
Change in terms of trade	0.00	0.07	0.07
	(0.2)	(3.6)	
Change in GDP, one lag	0.13	0.05	–0.08
	(2.6)	(0.8)	
Change in GDP, two lags	0.20	0.16	–0.04
	(4.3)	(2.7)	
Adjusted R^2	0.75	0.69	

Source: Authors' regressions based upon IMF (1998a, 1998b) and World Bank (1998).

a. Instrumental variable regressions using the following instruments: total inflows to sixty-one developing countries of foreign direct investment, portfolio investment, and loans; the one-year-lagged values of foreign direct investment, portfolio investment, and loans; the one-year-lagged percent change in GDP; the change in the terms of trade; and a dummy variable for whether a country had capital controls. The full sample and the emerging markets sample are described in the notes to table 2. In the full sample, the regressions contain 970 observations, and in the emerging markets sample, the regressions contain 305 observations. *t*-statistics are in parentheses.

b. Computed as saving minus investment.

negative correlation between total capital inflows and the current account is associated with loans, which raise investment but lower saving. Portfolio inflows have little impact on investment, saving, or the current account and appear to be largely offset by other financial transactions.

However, the strong positive effect of FDI on saving, implying the absence of any negative effect on the current account balance, is surprising.[32] Although the positive impact on saving might be dismissed in the full sample as a reflection of the imperfect nature of the IV estimation, it is also evident in the OLS estimates (not shown) for emerging markets. Furthermore, we note that the role of FDI is sensitive to the definition of the external balance. Additional analysis (not shown) finds that, like loans, FDI inflows have a negative effect on the trade balance for goods and services. This narrower measure excludes factor income payments and transfers.[33] The differences between the current account and the trade balance are less marked for the emerging market sample. It might be argued that variations in the impact on the current account are the result of changes in the timing between an inflow of financial capital and the purchase of real goods. To explore this possibility, we reestimated the equations in tables 3 and 4 using three-year averages. In this triannual data set, there are up to six observations per country, providing 340 observations in the full sample. The result was little or no change in the parameter estimates. As before, the aggregate capital inflows increase investment and the current account deficit, with no significant effect on saving; in contrast, the disaggregated IV equations show large positive effects of FDI on both investment and saving, with no net effect on the current account.[34] Loans continue to raise investment and lower saving, thereby accounting for all of the negative impact on the current account.

We conclude that although the disaggregated flows are consistently different in their effects on investment, they do not have stable and predictable differences in their impact on the net external balance and thus on saving. The results may reflect difficulty with obtaining reliable instruments for the disaggregated flows, but they are also consistent with the view that the different types of capital flows are fully fungible with one another in their financing of an external deficit.

32. Since the capital inflows are part of an overall balance of payments identity, we can apply the specification of table 4 to the other components: reserve accumulation, capital outflows, and extraordinary financing.

33. These items are sizable and volatile for many developing countries because factor payments include interest on foreign debt, and transfers are dominated by foreign aid and remittances from relatives living abroad.

34. The use of three-year averages also allows us to address some of the concerns about the presence of lagged capital flows and lagged GDP in the first-stage estimation. Any problem of autocorrelation is much reduced in the three-year averages.

Concluding Remarks

Our basic conclusions are that a large proportion of capital flows to developing countries over the past two decades has been used to finance current account deficits, and that this resource transfer is directed primarily into investment and not consumption. Our overview of capital flows reveals that the widely discussed surge in international capital movements to these countries in the last decade has been less dramatic than often suggested. First, the lion's share of the increase has gone to industrial, not developing, countries, and to a large extent the increase in capital flows to developing countries since the late 1980s reflects a return to earlier levels. Flows to these countries as a group amounted to roughly the same percentage of GDP in the mid-1990s as they had in the late 1970s. Further, capital inflows are highly concentrated among a small number of countries, those frequently labeled the emerging markets of Latin America and Asia.

The aggregate figures also mask a significant shift in the composition of capital inflows from bank lending toward FDI and portfolio capital. Perhaps surprisingly, we find very little correlation among types of capital inflows, either across countries or within countries over time. In particular, increased receipts of portfolio capital or bank loans are not associated with increased inflows of FDI. In the aggregate, about half of the inflows over the last two decades have been used to finance resource transfers through larger current account deficits. Roughly 30 percent of these inflows have been used to increase reserves, and a substantial portion has been offset by capital outflows.

Our regression analysis of the data for individual countries also suggests that about half of each dollar of capital inflow translates into an increase in domestic investment. There is a small negative effect, of marginal statistical significance, on national saving. In combination, the IV estimates for saving and investment suggest a foreign resource transfer equal to between 53 and 69 percent of the inflow of financial capital, with the remainder being diverted into reserve accumulation or capital outflows.

This aggregate result, however, masks significant differences among types of capital inflows. FDI appears to have highly beneficial effects on domestic investment: indeed, the results suggest a near one-for-one relationship. In contrast, portfolio capital inflows appear to have no discernible impact on investment, and the effect of loans lies between the

other two. We are less certain of the differential effect on the current account and saving. In some of the estimates, FDI appears to generate large increases in domestic saving, with no negative implications for the external balance, but the results were not robust to alternative specifications. Loans have a large negative impact on the current account, but a significant portion of the corresponding resource inflows is used to augment consumption. In this case, it would be useful to distinguish between public and private sector borrowing—something we have not yet incorporated into our data set.

Are these benefits of financial inflows sufficient to offset the evident risks of allowing markets to freely allocate capital across the borders of developing countries? The answer would appear to be a strong yes for FDI. Indeed, FDI has long been viewed as "different," and most countries have actively sought such investment through special provisions to permit exchange convertibility and repatriation of funds. However, the current debate over capital convertibility is much more focused on portfolio capital, which we find to have a lesser impact on real resource use.

It is probably a mistake to believe that the current momentum toward international financial liberalization can or should be reversed. At the same time, the orderly sequencing of financial liberalization appears to be extremely important: strengthening domestic markets and regulatory oversight should precede external convertibility. We interpret our results as supporting such a sequenced procedure, because the most useful form of capital inflow, FDI, can be accommodated without full capital convertibility.

APPENDIX

Table A1. Developing Countries in the Full Sample, by Region[a]

East Asia	*Middle East and*
China*	*North Africa*
Indonesia*	Algeria
Korea*	Cyprus
Malaysia*	Egypt
Philippines*	Iran
Taiwan*	Israel
Thailand*	Jordan
	Malta
South Asia	Morocco*
Bangladesh	Tunisia
India*	
Myanmar	*Latin America*
Pakistan	Argentina*
Sri Lanka	Bolivia
	Brazil*
Sub-Saharan Africa	Chile*
Cameroon	Colombia*
Côte d'Ivoire	Costa Rica
Ethiopia	Dominican Republic
Ghana	Ecuador*
Kenya	El Salvador
Madagascar	Guatemala
Malawi	Haiti
Mali	Honduras
Mauritius	Jamaica
Nigeria	Mexico*
Rwanda	Paraguay
Senegal	Peru*
Sierra Leone	Trinidad and Tobago
South Africa*	Uruguay
Tanzania	Venezuela*
Uganda	
Zambia	
Zimbabwe	

a. Asterisks indicate countries in the eighteen-country emerging markets sample.

Table A2. Capital Inflows by Region and Type, 1978–95

Billions of U.S. dollars

Region	1978–81	1982–89	1990–95
	All types		
Total	442	578	1,050
Industrial countries	374	554	915
Developing countries	68	24	135
Latin America	38	–5	47
East Asia	16	17	69
South Asia	3	6	10
Sub-Saharan Africa	5	1	3
Middle East and N. Africa	6	5	6
	Foreign direct investment		
Total	47	92	205
Industrial countries	38	79	151
Developing countries	9	13	54
Latin America	6	6	18
East Asia	2	5	31
South Asia	0	0	1
Sub-Saharan Africa	0	1	2
Middle East and N. Africa	1	1	2
	Portfolio investment		
Total	40	168	470
Industrial countries	38	166	418
Developing countries	2	2	52
Latin America	2	0	36
East Asia	1	2	12
South Asia	0	0	2
Sub-Saharan Africa	0	0	1
Middle East and N. Africa	0	1	2
	Loans		
Total	355	318	375
Industrial countries	299	309	345
Developing countries	57	9	29
Latin America	31	–11	–7
East Asia	13	11	26
South Asia	2	6	7
Sub-Saharan Africa	5	1	0
Middle East and N. Africa	5	2	3

Source: IMF (1998b) and authors' calculations.

Table A3. Capital Inflows to Emerging Markets, 1978–95
Billions of U.S. dollars, except as indicated

Country	Foreign direct investment 1978–81	1982–89	1990–95	Portfolio investment 1978–81	1982–89	1990–95	Loans 1978–81	1982–89	1990–95	Total 1978–81	1982–89	1990–95
Total	6.6	10.5	48.3	1.9	1.4	49.8	44.7	4.3	24.7	53.3	16.1	122.8
Latin America	5.2	5.4	16.3	1.5	-0.5	35.6	28.3	-11.2	-6.6	35.0	-6.3	45.3
Argentina	0.5	0.5	3.2	0.4	-0.3	8.0	1.4	-1.5	-4.2	2.3	-1.2	7.1
Brazil	2.2	1.6	2.2	0.3	-0.3	13.8	8.4	-6.4	-5.2	10.9	-5.1	10.8
Chile	0.3	0.5	1.5	0.0	0.0	0.5	2.8	-1.5	1.2	3.1	-1.0	3.2
Colombia	0.2	0.5	1.1	0.0	0.0	0.2	1.0	0.9	0.9	1.2	1.5	2.2
Ecuador	0.1	0.1	0.3	0.0	0.0	0.0	0.9	-1.0	-0.4	1.0	-0.9	0.0
Mexico	1.8	2.0	6.1	0.4	-0.1	10.3	11.4	-0.6	3.7	13.6	1.2	20.1
Peru	0.1	0.0	1.0	0.0	0.0	0.2	-0.1	-0.5	-0.4	0.0	-0.5	0.7
Venezuela	0.1	0.1	0.9	0.5	0.2	2.7	2.4	-0.6	-2.3	3.0	-0.3	1.2
Asia	1.5	5.0	31.4	0.6	2.0	13.3	14.6	14.6	29.8	16.8	21.6	74.6
China	0.1	1.8	19.4	0.0	0.6	1.5	1.2	2.5	0.8	1.3	5.0	21.7
India	0.0	0.0	0.7	0.0	0.0	1.5	0.7	4.1	3.4	0.7	4.1	5.6
Indonesia	0.2	0.4	2.1	0.1	0.1	1.6	1.2	3.3	2.5	1.4	3.7	6.3
Korea	0.1	0.5	1.0	0.1	0.2	6.0	4.8	-0.5	8.6	5.0	0.2	15.6
Malaysia	0.8	0.9	4.2	0.3	0.5	-0.7	0.4	0.4	2.1	1.5	1.8	5.6
Philippines	0.0	0.3	0.9	0.0	0.1	0.8	2.5	0.5	2.6	2.6	0.8	4.4
Taiwan	0.1	0.6	1.2	0.0	0.0	0.5	2.0	3.0	-0.1	2.2	3.6	1.6
Thailand	0.1	0.6	2.0	0.1	0.4	2.1	1.8	1.4	9.8	2.0	2.4	14.0
Africa	-0.1	0.8	0.5	-0.2	-0.1	0.9	2.3	0.9	1.6	2.0	1.6	2.9
Morocco	0.0	0.6	0.4	0.0	0.0	0.0	1.6	0.7	0.7	1.6	1.3	1.1
South Africa	-0.1	0.1	0.1	-0.2	-0.1	0.8	0.7	0.2	0.9	0.4	0.2	1.8

Memoranda:

All countries in the sample[a]	8.9	13.1	53.7	2.1	2.2	52.0	56.5	9.0	29.3	67.6	24.4	135.0
Emerging markets as percent of countries in sample	73.9	79.6	89.8	89.9	60.4	95.7	79.2	47.9	84.5	78.8	66.1	90.9
Sample countries plus OECD[b]	46.7	92.5	205.1	40.0	167.8	470.0	355.0	318.0	374.5	441.7	578.3	1,049.6

a. The fifty-eight countries in table A1 plus Guyana, Mozambique, and Nicaragua.
b. The sixty-one countries in note a plus twenty-three OECD countries.

Comment and Discussion

Carmen M. Reinhart: Capital flows to developing countries have been the subject of much discussion in recent years, in both academic and policy circles. In the early 1990s much of the discussion focused on the welcome resurgence of capital inflows to emerging markets after a decade during which many of these countries had limited, if any, access to international capital markets. The Mexican peso crisis in late 1994, the Asian crises in 1997–98, the Russian default in 1998, and Brazil's current woes have, however, shifted the tone of the discussion. Fickle portfolio flows and short-term bank loans have come to be widely perceived as a source of instability.

The literature of the 1990s on capital flows to emerging markets falls into four broad categories. The early literature attempted to examine the causes of these inflows. It was widely debated whether inflows were driven by "push" factors, such as interest rates and the stage of the business cycle in the United States, or by "pull" factors, which were largely taken to be privatization, structural reform, and inflation stabilization in the capital-importing countries. The majority of researchers concluded that external factors mattered a great deal.[1] A second, very large body of literature considered the policy challenges posed by a surge in capital inflows. These studies discussed the relative merits of a menu of policy responses to capital inflows, ranging from selective capital controls (a topic to which I will return) to changes in exchange rate policy. A third, rather slim strand of analysis focused on the behavioral characteristics of different types of

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1. Dooley, Fernandez-Arias, and Kletzer (1994) find the strongest effect for external factors among researchers who have studied this issue.

capital flows. The questions posed by these studies included the following: Does foreign direct investment (FDI) behave differently from portfolio flows? Are short-term flows more volatile and subject to sudden reversals? The answers to these questions have been mixed. The fourth category, taking the causes of the flows as given, turned its attention toward gauging their effects on the recipient countries. More often than not, these studies examined the link between foreign saving (the source of capital inflows) and domestic saving.[2]

The paper by Bosworth and Collins is a welcome contribution to the capital flows literature in that it merges the issues raised in the last two strands in the literature. On the one hand, the handful of papers that have examined the effects of capital flows on saving or growth in the capital-importing countries make little or no distinction among the various types of flows. On the other, the literature on behavioral differences has largely ignored the effects of capital flows on capital accumulation. If the received wisdom is correct and there are important behavioral differences across types of flows, then their effects on economic activity, such as saving and investment, are also likely to differ. This is the central issue investigated in this paper.

The paper begins with an overview of recent trends in capital flows to emerging markets. Along the way the authors examine capital inflows by type and use; they note that a substantial share of these inflows has been funneled into reserve accumulation, and that an equally large share found its way back out of the country. Neither of these observations should be particularly surprising. As regards outflows, the recent string of currency crises in emerging markets reminds us that international capital is volatile and prone to drastic reversals. Yesterday's inflows often become today's outflows. To illustrate with a recent example, in 1996 Thailand had a surplus in its capital account amounting to over 10 percent of GDP, yet one year later it ran a capital account deficit of 15 percent of GDP. That is a 26 percent swing in the course of a year—probably a record.

Similarly, it is not surprising that over a third of inflows to emerging markets financed the buildup of foreign currency reserves in the central bank, in light of the fact that very few developing countries allow their cur-

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2. See Reinhart and Talvi (1998) for a recent review of this literature, as well as for evidence from Asia and Latin America on the relationship between domestic and foreign saving.

rencies to float freely. Indeed, the most common policy response to capital inflows in the earlier part of this decade was sterilized intervention. The authorities intervened in the foreign exchange market to stem the currency appreciation associated with capital inflows and sold bonds in the domestic market to offset the monetary consequences of that intervention.

What is both surprising and interesting in the descriptive statistics presented in this paper is the extent to which different types of inflows show little correlation with one another. Although this kind of correlation analysis may face some limitations, particularly as regards portfolio flows (which are a phenomenon of the 1990s), these low correlations in a sense anticipate one of the paper's later results, namely, that not all capital flows are created equal. Low correlations may well arise if different types of capital flows respond to different factors. Montiel and Reinhart also present evidence in that regard.[3] Among the findings in that paper is that portfolio flows, particularly to Latin America, are extremely sensitive to the level of international interest rates, whereas FDI flows are little affected by such considerations. Hence these two types of inflows need not covary.

In their regression analyses of the impact of capital flows on saving and investment, the authors pool their cross-country and time-series data and, allowing for fixed effects, estimate a variety of reduced-form specifications, while recognizing that the capital inflow measures themselves are likely to be endogenous. After experimenting with various external (U.S.) variables, the authors settle on total gross capital flows to developing countries as the preferred instrument. This choice is not altogether surprising. As several studies have shown, U.S. interest rates have historically influenced capital flows, particularly to Latin America. Private capital flows to Asia, on the other hand, have tended to respond more to Japanese interest rates than to U.S. interest rates.[4] This observation would have simply argued for the inclusion of both interest rates in the vector of instruments. Yet the full "push" story of the 1990s also had to do with an exogenous, "latent" variable from the vantage point of emerging markets, namely, regulatory changes in the United States and Europe that made it easier for emerging markets to place equity and debt instruments in international capital markets.[5] Hence total capital flows to developing countries

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3. Montiel and Reinhart (forthcoming).
4. See Montiel and Reinhart (forthcoming).
5. See El-Erian (1992).

may be the "catch-all" that incorporates these unobservable variables, while from the vantage point of an individual country it is still exogenous.

One set of regressions in the paper controls for lagged GDP and the change in the terms of trade, in addition to a measure of total financial flows. A second set disaggregates total flows into FDI, portfolio flows, and bank flows. I will discuss the saving regressions first. My main criticism of these specifications is their failure to control for demographics. Other papers on the determinants of saving have used varied techniques and data samples. Although many of these studies have also employed a broad array of regressors, a common thread has been the inclusion of demographic variables in the standard set of regressions.[6] Bosworth and Collins acknowledge the role of demographics in their discussion, but they dismiss it as a variable on the grounds that dependency rates vary little over time. Their regression analyses, however, span twenty-seven years. Even if demographic changes are gradual, the cumulative changes over such an extended period can be dramatic. Indeed, a paper published by the International Monetary Fund that analyzed saving trends in Southeast Asia traced much of the increase in saving in that region to a marked secular increase in the working-age share of the population (see figure 1 below).[7] This positive demographic profile was not shared by other regions, and the stagnation of saving rates in Africa and Latin America has been linked in part to the persistence of high dependency ratios.

Other omissions from the authors' specification are the usual financial deepening, real interest rates, and fiscal deficits (owing to the Ricardian equivalence proposition) regressors often used in this literature on saving. However, the consequence of omitting these variables is less clear, as the evidence on their significance is rather mixed.

Concerns about a possible misspecification problem in the saving regressions notwithstanding, the results are consistent with the view that foreign saving tends to displace domestic saving. The coefficients on the capital flow variables are uniformly negative (with the exception of FDI), although they are not always significant, and they are between zero and minus one, which suggests that the offset is partial. The results on aggregate flows are in line with the results of several earlier studies, whereas the results for the disaggregated capital flow measures suggest that the

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6. See Edwards (1995).
7. Faruqee and Husain (1995).

Figure 1. Working-Age Population in Four Southeast Asian Countries, 1970–92

Percent of total population
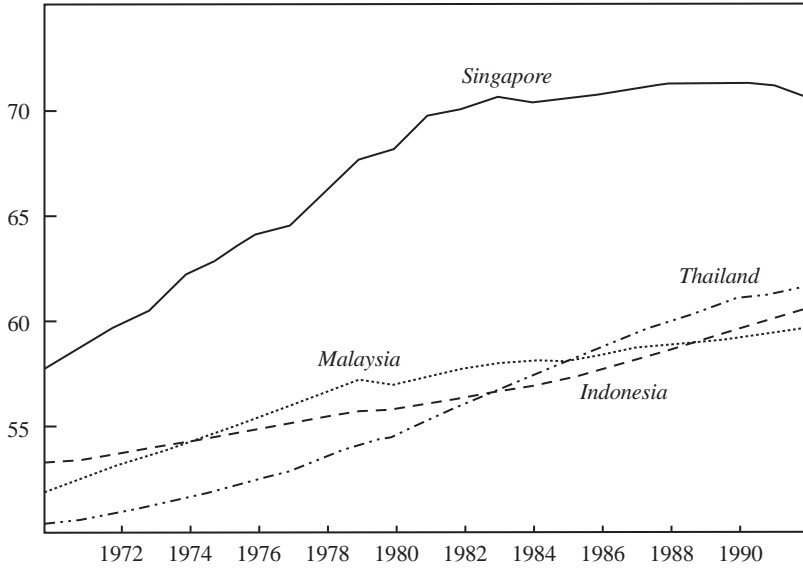
Source: Faruqee and Husain (1995). Reprinted with permission of the International Monetary Fund.

strongest negative link comes from bank loans, at least for the full sample of countries. This is quite interesting and intuitively appealing in light of the household consumption and saving story stressed in Obstfeld (1998) and discussed in this paper. If foreign banks lend to banks in emerging markets, households may find themselves with access to credit that was previously denied them. Indeed, booms in consumer loans have often characterized capital inflow episodes.[8] The result that FDI increases saving is somewhat puzzling and much harder to interpret on theoretical grounds, nor does the paper offer any explanation for it. Perhaps future research should aim at studying a more disaggregated measure of saving that disentangles corporate from household saving.

Turning to the investment regressions, the main result that emerges is that FDI shows the strongest link to aggregate investment, with a coeffi-

8. See Kaminsky and Reinhart (forthcoming).

cient close to one. Bank flows are also positively linked to investment, although the coefficient of this variable is about half of that of FDI; there is little evidence that portfolio flows have any effect on investment. Again, I would place less weight on the role of portfolio flows, given their brief history in developing countries. On the basis of these results, one is inclined to believe that FDI is the "preferred" type of flow for promoting growth. This, of course, assumes that the investment projects being undertaken are productive. As the recent Asian crises have revealed, that is not always the case. I will return to this issue later.

Although their results on investment have a clear intuitive appeal, I would urge the authors to extend their analysis of the links between investment and capital flows and to examine the role of capital flow volatility on investment. Such an exercise can be easily justified on theoretical grounds, as recent models of investment have stressed the role of uncertainty.[9] Uncertainty, in this case as regards the continued availability of finance, may be a powerful deterrent to the undertaking of investment in projects that take time to come to fruition.

As table 1 highlights, reversals in capital flows can be drastic. Furthermore, the evidence from many of the recent crises suggests that FDI has been more resilient than portfolio and other types of flows. Decomposing various types of capital flows into their stochastic trend (permanent) and cyclical and irregular (temporary) components, Sarno and Taylor find evidence that FDI has a higher permanent component than other types of flows.[10] Taking these observations together, some proxy for volatility, such as the change in capital flows from one year to the next, or their variance over a moving narrow window over the sample (say, five to seven years), may be worth investigating for its link to investment.

On the regressions of the current account and the trade balance I have little to say. An accounting identity tells us that capital inflows either finance a current account deficit or add to reserve accumulation, so the negative coefficients on all the capital flow variables are hardly surprising. What is puzzling is that the relationship between FDI and the current account (and, perhaps more surprisingly, the trade balance) is so imprecise so as to render the coefficient statistically insignificant. No obvious explanations for this result come to mind.

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9. Dixit and Pyndick (1994).
10. Sarno and Taylor (forthcoming).

**Table 1. Selected Large Reversals in Net Private Capital Flows
to Developing Countries**

Percent of GDP

Country and date of episode	Reversal
Argentina, 1982–83	20.0
Argentina, 1993–94	4.0
Mexico, 1981–83	12.0
Mexico, 1993–95	6.0
Venezuela, 1992–94	9.0
Thailand, 1996–98	26.0

Source: International Monetary Fund, *World Economic Outlook*, various issues.

Finally, let me turn to some of the policy implications raised by this analysis. This paper has suggested that the implications of a capital inflow for saving and investment depend importantly on the nature of that inflow. FDI is strongly linked to aggregate investment and appears not to displace domestic saving (although I am puzzled as to why it should *increase* saving). Bank flows have a smaller impact on investment and, at least for the full sample, are negatively related to domestic saving. Portfolio flows seem to matter little for either saving or investment. Evidence from other studies suggests that portfolio and bank flows are more prone than FDI to sudden reversals. Taken together with those findings, the evidence presented here not only suggests, as the authors note, that there may be good reasons for selective liberalization of the capital account. It also suggests an equally plausible rationale for the taxation of short-term and portfolio flows along the lines adopted. If we add to these arguments the fact that high levels of short-term debt exacerbated the recent crises, the case for discouraging short-term capital flows, whether in the form of bank loans or of bonds, is that much more convincing.

General discussion: Much of the discussion centered around the difficulties of interpretation created by the endogeneity of capital flows and the possibility of reverse causation. William Brainard noted, for example, that a rise in the profitability of investment would, by increasing the demand for foreign capital, contribute to a positive coefficient on capital flows in the investment equations. In this case the coefficient should not be interpreted as indicating the effect of capital flows on investment. He noted that Bosworth and Collins had dealt with this issue by looking for variables that would be associated with the supply of capital to developing countries

and using them as instruments in their first-stage regression for capital flows. They had reported that the U.S. short-term interest rate—a proxy for shocks to the supply of capital, which Carmen Reinhart and her coauthors had used as an instrument in explaining capital flows to Latin America—had not worked well. Therefore they had chosen total capital inflows to all developing countries as an instrument for explaining the inflows to particular countries. Brainard, while agreeing with the authors that exogenous shocks to the supply of capital are likely to be correlated across the sample of countries, observed that the same could be true for the demand for capital. A positive correlation across countries of the shocks to investment demand—shocks that country by country affect the demand for capital flows—implies that the errors in any particular country's investment equation are correlated with the capital flows of other countries and hence with total capital flows. Therefore the use of total capital flows as an instrument would not remove the bias in the coefficient estimates, and indeed would not necessarily improve on the ordinary least-squares regression.

Jeffrey Frankel was also skeptical of the use of total capital flows as an instrument in individual-country equations and suggested that U.S. interest rates are probably the best candidate for an instrument that is both exogenous to the country demands and plausibly related to the supply of capital. Both Frankel and Reinhart stressed that developing countries are highly sensitive to changes in U.S. interest rates—which are the strongest explanatory variable for explaining crises in developing countries. George Perry, however, queried whether the role of interest rates in crises, which would be especially important for countries that have large dollar debts outstanding, was relevant to the phenomena the authors were analyzing. He doubted that, in noncrisis times, a modest change in the U.S. rate would make much difference to decisions to invest abroad, since it would be swamped by large risk factors. Frankel did not disagree but wondered whether the exogenous movements in total capital flows as used by the authors might not also be contaminated by the crisis episodes.

Laurence Ball questioned the use of lagged capital flows and lagged GDP as instruments, given the likely serial correlation of errors. However, Bosworth noted that both measures are much more volatile in developing than in developed countries, so that serial correlation was likely to be less of a problem. He also reported that the first-stage coefficient on the lag was very small, typically about 0.25. When the lagged dependent variable was left out of the first-stage regressions, the only change was a worse fit.

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