

## CHANGES IN CAPITAL FLOW

### Capital Flows, Savings, and Growth in the 1990s

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#### INTRODUCTION

Recent economic literature has raised concerns about the deleterious effects of flows of hot—and maybe not so hot—capital on recipient developing countries. Despite the general perception that financial liberalization is a positive step, calls for capital controls have begun to appear (Bank for International Settlements, 1995; Eichengreen, Tobin, and Wyplosz, 1995).

Partly because they are related to the debate over capital controls, the implications that different categories of capital flows may have for a recipient country have received much attention, but the literature is not conclusive. Among the hot money analysts, Eichengreen and Fishlow (1995) have expressed special concern about the increasing share that portfolio equity flows account for among total capital flows to developing countries, because they believe that the potential volatility of portfolio equity flows is high and baneful. In contrast, Claessens, Dooley, and Warner (1995) use time-series results to argue that in most cases, labels such as short-term, long-term, or portfolio flows actually tell us little about flow volatility or about related time-series properties.<sup>1</sup>

Foreign direct investment may also be seen as having negative aspects. Froot and Stein (1991) find that foreign direct investment (FDI) in a country is in part determined by negative wealth shocks there, rather than anticipations of future growth. They focus on the wealth implications of devaluations to explain this phenomenon. The process they characterize may raise questions about the contribution of FDI to growth.<sup>2</sup>

Another issue that deserves the attention of anyone considering capital controls is whether international capital flows displace domestic saving. If they do, then the reduction in capital inflows imposed by capital controls might be offset by increased saving, meaning that the reduction in one category of funds for investment might be offset by the increase in another category of funds for

investment. Cohen's (1993) results offer a process by which increases in domestic savings may indeed offset reductions in foreign capital inflows and vice versa.<sup>3</sup>

But in addressing the various implications of modern capital flows one possible first step that seems to have received little direct attention is testing for which—if any—capital flows may contribute to economic growth. That this is a reasonable step may be seen from Corbo and Hernandez's (1995) argument that one reason why controls on short-term capital may be counterproductive is that the flows they discourage may contribute to growth. Moreover, it is difficult to assess the effectiveness of a policy, such as the imposition of various categories of capital controls, without calculating the cost—including the cost in lost growth, if any.

We examine the contributions that capital inflows may or may not make to growth in developing countries, as expressed by percentage changes in the gross domestic products of seven Latin American countries and of eleven other developing countries—most of which are Asian. Because of the large shifts in the media of capital flows—the bank loans that dominated the 1970s having in part been replaced by equity flows in the 1990s—we use two types of sample duration. Specifically, we examine the longer term effects of various flows by using data that begins in 1971, but we separately examine the implications of what Eichengreen and Fishlow (1995) call “the era of equity finance” using the sample period 1988-94.

Although our results are preliminary and tentative, we find that increases in the share of FDI to GDP are positively and significantly related to subsequent changes in GDP and, perhaps more surprising, that changes in the share of portfolio equity capital inflows to GDP also have a significant positive relation to subsequent GDP growth. We also find that, depending on the modeling approach taken, short-term capital inflows may have positive explanatory power for GDP growth in our sample and so, under fewer circumstances, may long-term capital inflows. We also find that, despite the decline in importance of bank lending as a medium of international flows of capital and the rise in importance of portfolio and foreign direct investment, the growth impacts of the various types of capital flows seem not to have changed significantly.

Since there is reason to wonder about the extent to which capital inflows may displace savings, as Cohen suggests might occur, we also test to see if capital flows affect saving and whether the effect is positive or negative. Recall that the displacement effect offers a reason to expect that the investment-reducing effects of capital controls might be offset by the investment-enhancing effects of greater saving. We find little evidence that capital inflows offset saving or vice versa. Indeed, foreign direct investment and portfolio equity flows turn out to have positive and significant effects on savings, while other types of capital flows offer mixed and insignificant effects. The displacement argument—that the negative investment effects of reductions in capital inflows might be offset by increased generation of investment capital through greater saving—receives cold comfort from our results.

Table 1. Equity and Foreign Direct Investment Flows to Selected Borrowers 1988 to 1994

	1988	1989	1990	1991	1992	1993	1994	1990-1994		Coefficient of Variation
								Average	Std. Dev.	
<b>Net Foreign Direct Investment (as a % of GDP)</b>										
Algeria	0.0	0.0	-0.0	-0.1	0.0	-0.0	NA	-0.0	0.0	-1.47
Argentina	0.9	1.1	1.7	1.9	2.0	2.6	0.5	1.7	0.8	0.45
Brazil	0.9	0.2	0.1	-0.0	0.3	-0.1	0.2	0.1	0.2	1.35
Chile	4.2	4.8	2.0	1.2	0.8	0.9	1.7	1.2	0.4	0.30
China	0.5	0.6	0.6	0.7	1.3	4.0	4.8	2.7	1.7	0.64
Colombia	0.4	1.3	1.2	1.1	1.6	1.6	2.4	1.7	0.5	0.29
India	0.1	0.1	0.1	0.1	0.1	0.2	0.5	0.2	0.2	0.72
Indonesia	0.6	0.7	1.1	1.3	1.4	1.4	1.7	1.5	0.1	0.09
South Korea	0.4	0.2	-0.0	-0.1	-0.2	-0.2	-0.4	-0.2	0.1	-0.54
Malaysia	2.0	4.3	5.5	8.7	9.9	8.7	4.5	7.9	2.0	0.26
Mexico	1.8	1.7	1.2	1.8	1.4	1.3	2.2	1.7	0.3	0.20
Morocco	0.4	0.7	0.7	1.2	1.5	1.9	2.2	1.7	0.4	0.22
Peru	0.1	0.3	0.2	-0.0	0.4	1.0	7.0	2.1	2.8	1.35
Philippines	2.4	1.3	1.2	1.2	0.4	1.4	2.2	1.3	0.6	0.49
Portugal	1.8	3.1	4.0	2.9	1.4	1.3	NA	1.9	0.7	0.39
Thailand	1.7	2.3	2.7	1.9	1.8	0.9	0.4	1.2	0.6	0.52
Turkey	0.4	0.6	0.5	0.6	0.5	0.4	0.4	0.4	0.1	0.19
Venezuela	0.0	0.2	0.2	3.3	0.7	-0.1	0.2	1.0	1.3	1.30
							Average	1.6	0.7	0.37

(continued)

Table 1. (Continued)

	Portfolio Equity Flows (as a % of GDP)										1990-1994		Coefficient of Variation
	1988	1989	1990	1991	1992	1993	1994	Average	Std. Dev.	Average	Std. Dev.		
Algeria	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.0	0.1	0.0	0.1	1.73	
Argentina	0.00	0.01	0.01	0.32	0.19	1.47	0.53	0.6	0.5	0.6	0.5	0.80	
Brazil	0.05	0.00	0.00	0.18	0.40	1.20	0.52	0.6	0.4	0.6	0.4	0.66	
Chile	0.11	0.86	1.12	0.00	0.83	0.80	2.05	0.9	0.7	0.9	0.7	0.80	
China	0.00	0.00	0.00	0.13	0.22	0.39	0.48	0.3	0.1	0.3	0.1	0.45	
Colombia	0.00	0.00	0.00	0.00	0.00	0.26	0.61	0.2	0.2	0.2	0.2	1.15	
India	0.02	0.05	0.03	0.00	0.09	0.70	2.19	0.7	0.9	0.7	0.9	1.18	
Indonesia	0.00	0.21	0.31	0.00	0.10	1.31	1.94	0.8	0.8	0.8	0.8	0.98	
South Korea	0.00	0.00	0.21	0.12	0.97	1.78	1.47	1.1	0.6	1.1	0.6	0.58	
Malaysia	0.00	0.50	0.69	0.00	0.73	6.18	3.28	2.5	2.4	2.5	2.4	0.95	
Mexico	0.00	0.00	0.26	1.71	1.77	4.26	1.24	2.2	1.2	2.2	1.2	0.53	
Morocco	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Peru	0.00	0.00	0.00	0.00	0.00	3.60	0.53	1.0	1.5	1.0	1.5	1.45	
Philippines	0.00	0.59	0.00	0.00	0.65	1.96	2.69	1.3	1.1	1.3	1.1	0.80	
Portugal	0.07	0.21	0.05	0.00	0.14	1.26	NA	0.5	0.6	0.5	0.6	1.21	
Thailand	0.76	1.94	0.53	0.04	0.00	2.54	1.69	1.1	1.1	1.1	1.1	1.02	
Turkey	0.00	0.05	0.03	0.00	0.00	0.10	0.38	0.1	0.2	0.1	0.2	1.30	
Venezuela	0.00	0.02	0.00	0.19	0.25	0.08	0.01	0.1	0.1	0.1	0.1	0.73	
							Average	0.8	0.7	0.8	0.7	0.96	

Source: IMF IFS and World Bank, World Tables 1995.

## II. SOME CHARACTERISTICS OF THE DATA ON CAPITAL FLOWS

Since the principal results of our analytic efforts involve the possible growth implications of changes in the GDP shares of net portfolio equity and FDI flows and since it has been argued (Eichengreen and Fishlow, 1995) that the rise in portfolio equity flows may be particularly problematic as sources of volatility, we begin by examining the characteristics of annual FDI and portfolio equity flows for the period 1988 to 1994 in the eighteen countries under broader examination in this study.<sup>4</sup>

Table 1 presents these flows on an annual basis and also characterizes their means, standard deviations, and coefficients of variation. Note that, consistent with the concerns of Eichengreen and Fishlow (1995), portfolio equity flows as a percentage of GDP do indeed have considerably larger coefficients of variation than FDI (0.96 to .37). An examination of the coefficients of variation on a nation-by-nation basis will show also that the high multi-country average coefficient of variation does not reflect domination by outliers. Of the seventeen countries for which comparisons are possible, only Brazil, China, and Turkey had higher coefficients of variation for FDI than for portfolio equity flows.<sup>5</sup>

Of the two forms of capital flows that receive attention in Table 1, FDI is more important overall in our sample of countries. However, fully 38% of the \$173 billion FDI total for 1990 through 1994 went to China. Leaving out China's \$66 billion, the totals for FDI and equity investment are comparable. Over half of the \$107 billion in equity flows went to three countries: Mexico (28%), South Korea (15%), and Brazil (10%). Major FDI recipients other than China include Mexico (14%), Malaysia (11%), and Argentina (9%). It should be noted, however, that bond issues and commercial bank loans were also important during this period.

Nevertheless, the recovery of FDI flows and the growth of equity portfolio investment are among the key defining characteristics of the early 1990s resurgence of capital flows. Specifically, after hitting a low during the nationalization wave of the 1970s, FDI began to regain importance after the debt crisis. But while FDI is perhaps the oldest form of North-South capital flow, having started with colonial investment in primary commodity industries, significant foreign portfolio equity investment in developing countries is a recent phenomenon.

## III. CAPITAL FLOWS, SAVING, AND GROWTH: SOME PRELIMINARY DIAGNOSTICS

As preparation for the construction of the models to link capital flows with growth and savings we now turn to a series of panel VARs—or Granger causality tests—that offer preliminary evidence that these links exist. Table 2 presents F-tests from a series of panel VARs in which growth is regressed on lagged values of growth and capital flows or capital flows are regressed on lagged values of

Table 2. Capital Flows and Economic Growth: Panel VARs 1971-1994

Type of Capital Flow:	Full Sample			Latin America			Asia			1990s <sup>4</sup>		
	Economic Growth	Capital Flows	Observations	Economic Growth	Capital Flows	Observations	Economic Growth	Capital Flows	Observations	Economic Growth	Capital Flows	Observations
<b>Current Account Deficit:</b> <sup>1</sup>												
Lagged Growth Terms	48.90 (0.0%)	17.7 (0.0%)	404	27.6 (0.0%)	15.9 (0.0%)	404	8.3 (0.4%)	5.8 (1.6%)	125	39.3 (0.0%)	8.1 (0.1%)	125
Lagged Capital Flows	9.07 (.3%)	218 (0.0%)	404	10.8 (0.1%)	81.0 (0.0%)	404	1.18 (27%)	141 (0.0%)	125	9.8 (0.2%)	53.3 (0.0%)	125
Observations:	404	404	404	184	184	184	229	229	229	125	125	125
<b>Foreign Direct Investment:</b> <sup>1</sup>												
Lagged Growth Terms	43.8 (0.0%)	5.4 (2.1%)	395	20.4 (0.0%)	6.6 (1.1%)	395	14.5 (0.0%)	1.0 (37%)	125	27.2 (0.0%)	2.0 (16%)	125
Lagged Capital Flows	3.7 (5.5%)	533.0 (0.0%)	395	7.7 (.6%)	52.6 (0.0%)	395	1.28 (28%)	337.0 (0.0%)	125	3.7 (5.8%)	219.7 (0.0%)	125
Observations:	395	395	395	184	184	184	220	220	220	125	125	125
<b>Equity Portfolio Flows:</b> <sup>3</sup>												
Lagged Growth Terms	42.5 (0.0%)	0.16 (68%)	104	7.90 (0.7%)	0.02 (90%)	104	23.7 (0.0%)	0.00 (99%)	118	31.7 (0.0%)	0.00 (99%)	118
Lagged Capital Flows	3.6 (6%)	31.9 (0.0%)	104	2.5 (12%)	10.6 (0.0%)	104	1.7 (20%)	21.4 (0.0%)	118	3.3 (7%)	32.1 (0.0%)	118
Observations:	104	104	104	56	56	56	62	62	62	118	118	118
<b>Short-Term Flows:</b> <sup>2</sup>												
Lagged Growth Terms	34.5 (0.0%)	12.9 (0.0%)	386	11.7 (0.0%)	8.45 (0.0%)	386	13.3 (0.0%)	9.1 (0.0%)	125	17.8 (0.0%)	10.9 (0.0%)	125
Lagged Capital Flows	2.2 (11%)	22.7 (0.0%)	386	1.9 (16%)	11.4 (0.0%)	386	0.04 (95%)	9.9 (0.0%)	125	3.0 (5.1%)	8.9 (0.0%)	125
Observations:	386	386	386	176	176	176	219	219	219	125	125	125
<b>Total Long-Term Flows:</b> <sup>2</sup>												
Growth Causes	33.4 (0.0%)	4.3 (1.4%)	386	11.7 (0.0%)	0.7 (47%)	386	13.8 (0.0%)	3.7 (2.7%)	125	17.6 (0.0%)	2.2 (11%)	125
Capital Flows Cause	0.3 (11%)	105.9 (0.0%)	386	0.5 (58%)	17.1 (0.0%)	386	0.24 (78%)	135.0 (0.0%)	125	1.6 (21%)	14.4 (0.0%)	125
Observations	386	386	386	176	176	176	219	219	219	125	125	125

Notes: <sup>1</sup>Estimated using a VAR with one lag for each variable.<sup>2</sup>Estimated using a VAR with two lags for each variable.<sup>3</sup>Estimated using a VAR with one lag for each variable.

Latin America.

<sup>4</sup>The "1990s" include 1988 to 1994, representing the post-debt crises period.

growth and capital flows. These so-called Granger causality tests offer only circumstantial evidence—for A to cause B, A must precede B—and they overlook the simultaneous interaction one is likely to find in annual data. They do point out certain general patterns in the relation between capital flows and growth and serve as a useful preamble to the construction of structural growth equations, a subject addressed in subsequent sections.

Overall, the results suggest that capital flows are significantly correlated with changes in future growth, although in many cases the pattern of “causality” is two way and not one way. Not surprisingly, higher growth also leads to higher capital inflows. The columns of Table 2 report F-tests and significance levels for omitting the lagged capital flow or growth variable. The future or dependent variables are given at the top of each column. The figure in parentheses below each F-statistic is the significance level; rejecting the null hypothesis of no causality with five percent or smaller significance level is the desired outcome.

The broadest measure of capital inflows or foreign savings examined here is the current account deficit. Except in the countries denominated Asian (which do include seven Asian countries but also include Algeria, Morocco, Portugal, and Turkey), capital inflows broadly defined have a significant impact on future economic growth. This pattern holds across most categories of capital flows, except for the puzzling lack of predictive power for long-term capital flows. The most pronounced differences appear between the Latin and Asian country groupings. Outside Latin America, growth leads capital flows while in Latin America and for the sample as a whole, capital flows lead growth. But note that this is often a two-way relationship: growth leads foreign savings—broadly defined—in almost all cases. Growth also leads to more short-term capital inflows, but this linkage is not present in the non-Latin group for any other specific category of capital flows.

Similarly, changes in the ratio of lagged FDI to GDP have significant (10% or less) explanatory power for growth. Again, these effects are stronger in Latin America than in Asian countries—where domestic savings rates are generally higher than in Latin America. A similar measure of portfolio equity flows—again, changes in GDP share—has stronger explanatory effects in Latin America.<sup>6</sup> Neither the long- nor short-term capital flows aggregates display a significant growth coefficient for the full sample, for Latin America or the non-Latin American or so-called Asian group. Changes in short-term capital flows, however, do have predictive power for growth in the post-debt crisis era (1988-94).

Additional evidence of the link between capital flows and growth appears in Table 3, where a similar series of panel VARs are reported with changes in gross domestic savings replacing the growth variable. Foreign savings are more likely to increase growth the less they reduce domestic savings. These results show that increases in either FDI or equity capital inflows tend to be followed by positive changes in domestic savings. This relation is most consistent for equity flows. Note, however, that the significance of this relationship for FDI and equity portfolio flows in the Full Sample column depends on excluding Mexico. Including

Table 3. Capital Flows and Domestic Growth: Panel VARs 1971-1994

Type of Capital Flow:	Full Sample <sup>3</sup>			Latin America			Asia			1990s <sup>4</sup>		
	Domestic Savings	Capital Flows	Domestic Savings	Capital Flows	Domestic Savings	Capital Flows	Domestic Savings	Capital Flows	Domestic Savings	Capital Flows	Domestic Savings	Capital Flows
<b>Current Account Deficit:</b> <sup>2</sup>	<i>F-Tests (significance level)</i>											
Lagged Savings	835 (0.0%)	5.2 (0.5%)	155.7 (0.0%)	6.3 (0.2%)	628.0 (0.0%)	0.8 (44%)	501 (0.0%)	0.7 (52%)	501 (0.0%)	0.8 (44%)	501 (0.0%)	0.7 (52%)
Lagged Capital Flows	8.05 (.03%)	93.6 (0.0%)	2.7 (7%)	37.7 (0.0%)	3.15 (5%)	59 (0.0%)	6.6 (0.2%)	27.1 (0.0%)	6.6 (0.2%)	59 (0.0%)	6.6 (0.2%)	27.1 (0.0%)
Observations:	386	386	176	176	219	219	125	125	125	219	125	125
<b>Foreign Direct Investment:</b> <sup>3</sup>												
Lagged Savings	680 (0.0%)	6.4 (.6%)	20.4 (0.0%)	6.7 (.2%)	14.5 (0.0%)	0.1 (87%)	543.0 (0.0%)	1.1 (35%)	543.0 (0.0%)	0.1 (87%)	543.0 (0.0%)	1.1 (35%)
Lagged Capital Flows	2.0 (14%)	267 (0.0%)	1.1 (33%)	37.1 (0.0%)	1.28 (280%)	331 (0.0%)	3.6 (3%)	114.6 (0.0%)	3.6 (3%)	331 (0.0%)	3.6 (3%)	114.6 (0.0%)
Observations:	333	333	176	184	210	210	111	111	111	210	111	111
<b>Equity Portfolio Flows:</b> <sup>3</sup>												
Lagged Savings	453 (0.0%)	0.60 (55%)	453.0 (0.0%)	2.2 (12%)	197 (0.0%)	0.80 (45%)	453 (0.0%)	0.60 (55%)	453 (0.0%)	0.80 (45%)	453 (0.0%)	0.60 (55%)
Lagged Capital Flows	3.5 (3%)	9.2 (0.0%)	3.5 (3%)	3.3 (5%)	2.6 (8%)	9.6 (0.0%)	3.5 (3%)	9.2 (0.0%)	3.5 (3%)	9.6 (0.0%)	3.5 (3%)	9.2 (0.0%)
Observations:	104	104	42	42	53	53	89	89	89	53	89	89

Notes: <sup>1</sup>The dependent variable is listed across each column, lagged effects down the rows.

<sup>2</sup>Estimated using two lags for each variable.

<sup>3</sup>Estimated using a VAR with one lag for each variable. Mexico has been dropped from both the equity and FDI sample. If Mexico is included, the significance of capital flows changes on domestic savings typically drops below 5% significance.

<sup>4</sup>The "1990s" include 1988 to 1994, representing the post-debt crises period.



Mexico in the sample typically reduces the significance of the capital inflows/ domestic savings relation. This result suggests that Mexico's recent experience of large capital inflows followed by a drop in domestic savings is not typical of emerging market capital recipients.

These results provide a broad view of the correlation between capital flows and growth and future changes in them. The results do not, however, tell us about the magnitude and direction of these effects.

**Table 4. Capital Flows and Economic Growth Two Stage Least Squares Panel Regressions: 18 Countries 1971-94<sup>1</sup>**

Independent Variables	Dependent Variable: Log Change in Real GDP <sup>1</sup>					
	(4.1)	(4.2)	(4.2a)	(4.2b)	(4.3)	(4.4)
Current Account Deficit (change in GDP share)	0.92 (4.1)					
Lags	(sum of t and t-1)					
Foreign Direct Investment (change in GDP share)		1.36 (3.1)	1.34 (3.0)	1.41 (2.5)		
Lags		(t-1)				
Equity Portfolio Flows (change in GDP share)		0.89 (1.96)	1.06 (2.2)	0.91 (1.8)		
Lags		(t-1)				
Short-Term Capital Flows (change in GDP share)					1.92 (4.7)	0.65 (3.82)
Lags					(sum of t and t-1)	
Long-Term Capital Flows (change in GDP share)					0.25 (1.0)	0.67 (3.85)
Lags					(sum of t and t-1)	
External Terms of Trade (change in log level)	0.09 (3.31)	0.07 (1.1)	0.06 (.9)	-0.04 (-.3)	0.04 (1.9)	0.04 (2.5)
Lags	(t-1)					
Total Debt Service (%GDP) (change in GDP share)	-0.04 (-2.3)	-0.04 (-2.3)	-0.05 (-2.1)	-0.05 (-1.5)	-0.03 (-2.0)	-0.02 (-1.4)
Lags	(t-1)					
Constant Term	0.05 (5.9)	0.06 (5.8)	0.07 (5.9)	0.06 (4.5)	0.05 (8.5)	0.05 (9.1)
Test for Null Hypothesis of Equal Capital Inflow Coefficients:						
F-Statistic		0.55	0.18	0.47		0.03
Prob Value		0.46	0.68	0.5		0.86
Number of Observations	238	79	74	34	375	370
Estimation Method	2SLS <sup>1</sup>	OLS	OLS	OLS	2SLS <sup>1</sup>	2SLS <sup>1</sup>
Sample	All Ctys	All Ctys	w/o Mexico	Asia	All Ctys	All Ctys

Note: 1. Instruments include lagged and contemporaneous terms of trade, lagged growth, capital flows, real exchange rate and debt service. Flows are generally changes in the share of GDP. GDP and terms of trade are log changes.

#### IV. CAPITAL FLOWS AND GROWTH: INSTRUMENTAL VARIABLES ESTIMATES

The most significant econometric details of our narrative appear in Tables 4 and 5, and they offer little direct or indirect support for capital controls. Foreign direct investment and portfolio equity investment both have positive and significant explanatory power for growth in the sample countries, and so do short-term capital flows. Moreover, we are not able to reject the null hypothesis that portfolio equity investment has as strong explanatory power for growth as FDI has. Volatile or not, portfolio equity flows seem to offer a significant contribution to subsequent growth.

If these results (Table 4) raise questions about the consequences of capital controls, the savings equations results (Table 5) raise even more. Not only do

*Table 5. Capital Flows and Domestic Savings Two Stage Least Squares Panel Regressions: 18 Countries 1971-94<sup>1</sup>*

Independent Variables	Dependent Variable: Log Change in Real GDP <sup>1</sup>					
	(5.1)	(5.2)	(5.3)	(5.4)	(5.4)	(5.5)
Current Account Deficit (change in GDP share)	-0.17 (-1.1)					
Lags (sum of t and t-1)						
Foreign Direct Investment (change in GDP share)		0.01 (0.5)		0.24 (1.83)	0.11 (.67)	
Lags (sum of t, t-1)						
Equity Portfolio Flows (change in GDP share)		1.29 (.26)	0.95 (2.5)			
Lags (sum of t, t-1)						
Short-Term Capital Flows (change in GDP share)						0.19 (1.4)
Lags						
Long-Term Capital Flows (change in GDP share)						-0.18 (-.67)
Lags						
External Terms of Trade (change in log level)	0.08 (2.5)		0.134 (4.4)	0.142 (4.7)	0.13 (4.2)	
Total Debt Service (%GDP) (change in GDP share)	-0.01 (-1.0)	-0.01 (-1.2)	-0.003 (-27)	-0.02 (-7)	0.01 (-.3)	-0.003 (.01)
Lags (t-1)						
Constant Term	0.41 (.77)	-0.99 (-1.2)	0.07 (5.9)	-0.22 (-43)	-0.18 (-.3)	0.06 (.6)
Number of Observations	448	118	118	104	118	405
Estimation Method	2SLS <sup>1</sup>	2SLS <sup>1</sup>	2SLS <sup>1</sup>	2SLS <sup>1</sup>	2SLS <sup>1</sup>	2SLS <sup>1</sup>
Sample	All Ctys	All Ctys	All Ctys	w/o Mexico	w/o Mexico	All Ctys

*Note:* 1. Instruments include lagged and contemporaneous terms of trade, lagged growth, capital flows, real exchange rate and debt service. Flows are generally changes in the share of GDP. GDP and terms of trade are log changes.

inflows of any category of foreign capital not significantly displace domestic savings—suggesting that reduced capital inflows may not even partially be offset by increased savings—but foreign capital inflows and saving turn out to be positively related in some cases. In fact, any time the relation between capital inflows and saving is significant at the .10 level or better, it is always positive. At the very least, this result suggests that savings increases will not even partially offset the reduction in investment capital that would occur as a result of capital controls.

Before addressing these results more fully, however, some econometric details deserve attention. The results of the previous section—that higher capital flows lead to higher growth and vice versa—confirm Barro and Sala-i-Martin's (1995) allegations that simultaneity bias is a common problem in estimating growth rate regressions. While the optimal response to this problem is to estimate a fully specified simultaneous equation growth model, the lack of data for key variables and the limited number of observations for the variables we happen to have invites a retreat to the second-best approach: estimating a reduced-form growth equation using instrumental variables to reduce simultaneous equation bias. The results appear in Table 4.

In addition to the capital flows variables that are the focus of this paper, we also included as regressors the changes in each country's external terms of trade and each country's total debt service payments as a share of GDP. Terms of trade changes may be seen as triggering changes in returns to capital. A variable for terms of trade changes is accordingly included as a way of correcting for endogenous effects on capital flows. The debt service payments variable is intended to capture the effects of changes in world interest rates weighted by the countries' external debt obligations. In every case, lagged values of the capital flows and growth plus lagged real exchange rate changes serve as instruments. The only contemporaneous variable used as an instrument was the log of change in each country's terms of trade.

Equations 4.1, 4.3, and 4.4 in Table 4 are estimated using instrumental variables methods, while 4.2, 4.2a, and 4.2b use OLS because they do not include contemporaneous values of any independent variable. Changes in FDI and equity investment as a share of GDP are included in the same regression to allow us to statistically compare the two coefficients. Similar results are obtained if each capital flow variable is introduced separately. Note that foreign savings broadly defined (a current account deficit) now has a positive effect on growth. The coefficient estimate shown in Table 4 is in fact the sum of the current and one lagged coefficient. The lagged coefficient for foreign savings is negative but is dominated by the positive contemporaneous term. A similar pattern was evident in the VARs where lagged current account deficits reduce growth.

For FDI and equity inflows, however, both the lagged and contemporaneous growth impacts are positive. Although FDI flows have the strongest growth effect, portfolio equity flows' effect is not much smaller. In fact, as can be seen from tests reported in Table 4, portfolio equity flows' effect may not really be smaller at all. We test for the equality of the FDI and portfolio equity coeffi-

cients. Even though the portfolio equity inflow coefficient is always lower than the FDI coefficient, F-tests listed near the bottom of Table 4 show that the differences are never statistically significant.

Compared with the FDI and portfolio equity, short-term and long-term capital flows' effects on growth are more ambiguous. If only the contemporaneous change in capital inflows is included (equation 4.4), both short-term and long-term flows have positive effects on growth. But if we include contemporaneous and lagged effects and sum terms for the two, as in equation 4.3, changes in long-term capital inflows become insignificant while the coefficient of short-term capital flows increases.

We suspect that the lagged negative effect of long-term capital inflows in these and other equations—as reflected in the lower coefficient for long-term capital in 4.3 (with contemporaneous and lagged values) compared with 4.4 (only contemporaneous values)—reflect adjustment problems created by the 1980s debt crisis. During the crisis long-term lending fell first. That decline forced countries such as Mexico and Brazil to turn to short-term borrowing. Then, sources of short-term funds dried up. Growth collapsed.

We now turn to the impact of capital flows on gross domestic savings. Table 5 reports two-stage least squares estimates. Across the board, the results are less conclusive. But although their statistical significance is usually low and sometimes very low, FDI and equity flows at least have a positive impact on domestic savings.

Recall that there is no theoretical reason why capital inflows ought to increase domestic savings. The more typical and compelling question is whether or not capital inflows discourage domestic savings, particularly private domestic savings. While current account deficits and long-term capital inflows are negative, their effects are not statistically significant. Note that terms-of-trade shocks have a large impact on domestic savings, as may be expected from a transient shock to income.

## V. CONCLUDING REMARKS

Though much can be done to extend and verify these results, there appears to be an important relation between various categories of capital flows and overall GDP growth for the sample of eighteen countries examined here. Capital flows can indeed be volatile. But if a government decides to use capital controls to reduce volatility by reducing capital inflows—including the portfolio equity flows that concern Eichengreen and Fishlow (1995)—the price is some growth.

Generally, the statistical relation we find between capital flows and subsequent growth is stronger in Latin America than among the Asian countries—where domestic savings play a more significant role in the economy. However, the relation between capital flows and subsequent growth seems not to have

changed much in the 1990s, despite the relative shift away from bank lending and toward equity capital.

Sometimes our results were insignificant as in the insignificantly positive relation between long-term capital flows and growth in 4.3. But foreign direct investment and portfolio equity investment are always positively associated with growth and domestic savings. We also find that especially in Latin America, growth leads to additional capital inflows. The relation between capital flows and growth is weaker outside Latin America, but still evident for many of the capital flow measures and categories tested.

If a country wants to impose capital controls, the last type of capital it ought to want to control is FDI. When and where capital inflows do affect growth, foreign direct investment tends to have the most pronounced positive impact on it. The correlation between FDI and growth has clear policy implications for privatization initiatives and foreign ownership restrictions.

Though the sample of portfolio equity flows is much smaller, they also have a smaller but positive correlation with economic growth generally. But Mexico has been an important exception. This observation suggests that it may be unwise to apply lessons from Mexico's experience to other countries or to draw conclusions about the welfare impacts of capital flows from Mexico's experience alone.

More generally, our results justify the concerns of Corbo and Hernandez (1995) and others about the potential output losses resulting from capital controls, even on short-term or equity capital flows.<sup>7</sup> Despite the complications that volatile capital flows create for macroeconomic and exchange rate policies, our results suggest an overall positive correlation between growth and capital flows.

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## NOTES

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1. Taking a third point of view, Dooley (1994) addresses some peculiar endogeneities with respect to capital flows to developing countries, arguing that some are simply efforts to exploit government subsidies or guarantees.

2. Moreover, while the authors note that their welfare analysis cautions against "the kinds of knee-jerk protectionist sentiments that are often aroused by these accounts" (p. 1215), their model and empirical results could conceivably allow some readers to conclude that capital controls for foreign direct investment might be in order.

3. More specifically, Cohen models and tests circumstances under which a dollar increase in debt service payments of rescheduling countries in the 1980s crowds out far less than a dollar in investment in these countries. The difference is made up by

related changes in domestic saving. To the extent that this argument is symmetric—in as much as capital outflows through debt service payments are partially offset by increased savings—capital inflows may be seen as likely to be partially offset by reduced saving.

4. All data used in this study are annual and come from the World Bank, World Tables, 1995.

5. Portfolio equity flow data were not available for Morocco.

6. Note that the portfolio equity flow data in the “Full Sample” column—unlike the “Full Sample” column’s current account deficit data, foreign direct investment data, short-term flows data, or total long-term flows data—excludes Mexico. Including Mexican data in the full sample significantly lowers the F-value that characterizes the link between growth and capital flows. We do include Mexican data on portfolio equity flows for the “Latin America” column.

7. Dooley (1995) argues that if volatile capital flows are a problem, they often are because agents are responding to market distortions created by the government of the recipient country. When agents are simply responding to implicit government insurance or other implicit guarantees, governments ought to remove the insurance or guarantees instead of imposing the second-best solution of capital controls.

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