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The Growth-Interest Rate Cycle in the United States and its Consequences for Emerging Markets

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The Growth-Interest Rate Cycle in the United States and its Consequences for Emerging Markets

by

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Prepared for the Seminar

"What is Holding Back Growth in Latin America and the Caribbean? What Should Governments Do?"

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and Inter-American Investment Corporation

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1. Introduction[1]

At the time of writing there were widespread concerns about the health of the U.S. economy. There is conclusive evidence that the pace of growth has slowed, which has prompted the Federal Reserve to cut interest rates on two occasions (a total of 100 basis points thus far). As usual, when faced with this kind of turning point, analysts and policy makers alike wonder whether the United States will achieve a "soft landing" or whether the downturn is more serious and protracted—in the worst scenario, the new weakness could signal the end of the new economy. Furthermore, recent inflation surprises have not been encouraging, as higher-than-expected inflation numbers may curtail the Federal Reserve's desire and ability to act countercyclically.

In this paper, we do not attempt to provide any insights into what lies ahead for the U.S. economy. Our focus is on gaining a better understanding of how the U.S. business cycle, its associated monetary policy cycle, and their interaction affect developing countries. The question of North-South linkages is hardly a new one; the role of trade and primary commodity markets in linking developed and developing countries has a long history (see, for instance, Prebisch, 1950 and Singer, 1950). The links between debtor and creditor nations are also not new (see Diaz-Alejandro, 1984, Dornbusch, 1985, and Calvo, Leiderman, and Reinhart, 1993). Indeed, what is "new" is that some links that had been thought to be extinct have revived in recent years while some "old" links have weakened. As Bordo and Eichengreen (1998) observe, the decade of the 1990s shares some of the features of an earlier age of globalization and high capital mobility prior to World War I; namely, portfolio capital flows to emerging markets have re-emerged as an important link between northern lenders and southern borrowers. This revival is particularly pronounced in the larger Latin American countries. Some of the traditional links, however, may have weakened, as many countries in Asia and Latin America have successfully diversified their exports away from primary commodities. Hence, terms-of-trade shocks may (in some cases) play a smaller role today than in the past. Both of these observations would suggest that, in general, trade/commodity price links may have weakened while financial links may have become stronger. However, one must be cautious in interpretation owing to the large variation across countries in the degree of trade and capital market integration. While the share of primary

[1] The views expressed in this document are the authors' and do not necessarily reflect those of the Inter-American Development Bank.

commodities in Mexico's exports has declined dramatically in the past 30 years, the importance of U.S. markets, owing to NAFTA, has soared, which suggests that the trade channel is quantitatively important in the Mexican case.[2] These are the questions we analyze. Our focus is on how developments in the United States affect capital flows and growth in emerging market countries across various regions and country groups.

In the next section, we review the transmission mechanisms whereby shocks in the North are propagated to the South. In Section 3, we present the stylized evidence on how capital flows and growth in developing countries vary with the business and monetary policy cycle in the United States, while in Section 4 we present some basic tests that take a first cut at the data. The final section summarizes our main findings.

2. North-South Links

In this section, we discuss various channels through which economic developments in developed countries, particularly the United States, can potentially affect developing economies.[3] On the emerging markets side, our focus is on capital flows—their level and composition—and on economic performance, as measured by GDP growth. One strand of our analysis focuses on the role of the economic cycle in the United States, while the other focuses on the interest rate cycle.

The Channels of Transmission

Simple trade models suggest that a slowdown in a large developed economy will have adverse consequences on its trading partners, to the extent that the demand for imports in the decelerating economy has a positive income elasticity. The higher the share of exports of the country that are funneled to the country experiencing the economic downturn, the more negative the consequences. On the basis of this channel, for example, Mexico would be far more affected by an economic downturn in the United States than Argentina, since as of 1999 about 88 percent of all Mexican exports were directed toward the U.S. market, while only about 11 percent of Argentina's exports were destined for the United States.[4] Furthermore, the degree of openness (say, as measured by exports to GDP) reinforces the contrast between Argentina and Mexico, with the former being a much more closed economy. Other things being equal, the higher the

[2] About 88 percent of Mexican exports went to the United States in 1999.
[3] The analysis in the next three sections draws heavily on Reinhart and Reinhart (2001).

income elasticity of imports in the developed country, the more pronounced the contraction in the developing country's exports will be. In this regard, developing countries that export predominantly manufactured goods (which typically are more sensitive to income) may fare worse than their counterparts exporting primary commodities, which tend to be relatively income-inelastic.[5] The differences in export structure across developing countries are, indeed, significant. For instance, the contrast between the export structure of East Asian countries (heavily weighted to manufactures) and that of most African countries (predominantly skewed to primary commodities) is particularly striking.[6]

The preceding discussion, however, ignores the fact that the business cycle in the world's largest economies may itself exert a significant influence on the terms of trade of their smaller trading partners, the developing countries, as argued in Dornbusch (1985). Perhaps the clearest example of this comes from international commodity markets. The literature on commodity price determination has consistently accorded a significant role to the growth performance of the major industrial countries.[7] Recessions in industrial economies, particularly the United States, have historically been associated with weakness in real commodity prices. The implication is that, other things being equal, commodity exporters, who are also hit with an adverse terms-of-trade shock, will suffer more. Finally, a change in real exchange rates among G-3 countries will also have an impact. For example, a depreciation of the U.S. dollar versus the Euro would most benefit countries whose currencies are tied to the U.S. dollar but tend to export to Europe (i.e., Argentina).

Yet, the impact of fluctuations in the business cycle on developing economies is not limited to the income and relative price effects discussed above. There is a well-established, endogenous and countercyclical "monetary policy cycle" in the major developed economies. Central banks ease monetary conditions and reduce interest rates during economic downturns and increase interest rates when signs of overheating develop. Calvo, Leiderman, and Reinhart (1993) stress the importance of U.S. interest rates in driving the international capital flow cycle.

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[4] The stylized evidence on patterns of trade is discussed in the next section.

[5] See, for example, Reinhart (1995), who estimates industrial countries' import demand function for various regions and countries with varying degrees of export diversification and primary commodity content.

[6] For example, manufactures account for only 10 percent of exports from Côte D'Ivoire but account for more than 65 percent of Thai exports.

[7] See, for example, Dornbusch (1985); he stresses the role of the demand side in commodity price determination. Borensztein and Reinhart (1994), who incorporate supply-side developments into their analysis, also find a significant and positive relationship between growth in the major economies and world commodity prices.

They present evidence that, in periods of low interest rates in the United States, central banks in developing countries in Latin America systematically accumulate foreign exchange reserves and that the real exchange rate appreciates; both of these developments are symptoms associated with capital inflows. Subsequent studies, which examined net capital flows and a variety of their components over various sample periods and incorporated developing countries in other regions, found similar evidence. This link between the interest rate and capital flow cycle may arise for a variety of reasons. It may be the case that investors in developed economies, faced with lower interest rates, are inclined to seek higher returns elsewhere (i.e., the demand for developing country assets increases). It could also be that the decline in international interest rates makes borrowing less costly for emerging markets and increases the supply of emerging market debt. As illustrated in the interest rate parity condition below, where e denotes the expected change in the exchange rate, the decline in the cost of borrowing for emerging-market countries (i) may be even greater than the decline in international interest rates (i^*) if the country risk premia (ρ) is itself a positive function of international interest rates:

$$i = i^* + \rho(i^*) + \in^e, \rho' > 0$$

The evidence presented in Fernández-Arias (1996) and Frankel, Schmukler and Servén (2001) suggests that the country-risk premia in many emerging markets is indeed affected by international interest rates in a way that amplifies the interest rate cycle in industrial countries. Taken together, these findings would suggest that the trade and finance effects that arise from the growth and interest rate cycles, respectively, in developed economies tend to at least partially offset each other. The countries that would benefit the most from the interest rate cycle may well be those that start from a shakier financial position—that is, those with the highest international debt-to-reserves ratios. This is so because these countries would benefit the most from a decline in debt-servicing costs (possibly also owing to a larger decline in their risk premia) and lose the least in interest earnings from holding international reserves. For example, a country like China, which has a low level of external debt and a high level of external reserves, might even benefit from interest rate increases in the United States—especially if the rate increases are owing to a buoyant economy. For other low-income countries, which have no access to international capital markets under any interest rate scenario, this capital flow-debt servicing channel may not be present at all. Calvo and Reinhart (1996), for instance, who analyze the determinants of capital flows to Africa, present evidence that (unlike other regions) capital flows are not systematically

affected by changes in international interest rates but are heavily influenced by terms-of-trade fluctuations.

Table 1. Developed and Developing Country Links

Type of shock	Transmission channel	Amplifiers	Expected growth consequences
The growth cycle: Low growth/recessions in the G-3			
Income effects	Trade: Lower exports to G-3	High trade exposure High G-3 income elasticities	Negative
Relative price effects	Trade: Decline in the terms of trade for developing countries	High primary commodity content in exports High exposure to cyclical industries in exports	Negative
International capital flows	Finance: Higher bank lending to emerging markets but lower FDI	Large declines in the domestic demand for bank loans	Ambiguous
The interest rate cycle: Low interest rates/monetary easings			
International capital flows	Finance: Higher portfolio capital flows to emerging markets	Developed bond and equity markets. Large interest rate spreads. High interest sensitivity of flows.	Positive
Debt servicing	Finance: Lower cost	High levels of debt relative to reserves. Sensitive risk premia to international interest rates	Positive
Interest earnings	Finance: Declining interest income	High level of reserves relative to debt	Not obvious

3. The Role of G-3 Developments: The Stylized Facts

In this section, we present stylized evidence on the "North-South" links discussed in the preceding section. For emerging markets, we examine international capital flows and growth in relation to various measures of the United States growth and interest rate cycle and contrast periods of high interest rate and exchange rate volatility with those where volatility was relatively subdued. We present evidence on the direction of "North-South" trade and on the impact of industrial country developments on international commodity markets.

Our data is annual, spanning from 1970 to 1999, and the country groupings are those reported in the International Monetary Fund's *World Economic Outlook* (WEO). For capital flows, these groupings are the following: All emerging markets, Africa, Asia crisis countries, other Asian emerging markets, the Middle East and Europe, the Western Hemisphere, and countries in transition. In reporting growth aggregates, the WEO groups the Asian countries somewhat differently; the two reported subgroupings are newly industrialized Asia and Asia; all other categories remain the same.[8] We examine the cyclical behavior of net private capital flows and their components: net private direct investment (FDI), private portfolio investment (PI), other net private capital flows (OTF)—which is heavily weighted toward bank lending and capital flight, and net official flows (OFF). We focus on real capital flows, defined as nominal capital flows (in U.S. dollars) deflated by the U.S. consumer price index. The figures reported in this section are in billions of 1970 dollars.

The Growth Cycle, Capital Flows, and Emerging Market Growth

Given its prominent position in the world economy, the United States business cycle (not surprisingly) has important repercussions for the rest of the world. Developed economies, most notably Canada, are deeply affected by economic developments in the United States; the same holds true for developing economies, especially those in the Western Hemisphere and newly-industrialized Asia, whose fates are more closely aligned with those of the United States than other developing countries. To examine the behavior of growth and various types of capital flows to emerging markets, we first split the sample into two states of nature according to two criteria. The first of these parsing strategies involves separating the period into recessions and expansions, according to the National Bureau of Economic Research's dating of U.S. business

cycle turning points; if six or more months of a given year fall into the recession category, then that year is labeled a recession year. The second cut of the data divides the sample into those periods in which U.S. real GDP growth is above the median growth rate for the sample and those in which growth is below the median. Figures 1 and 2 depict capital flows to emerging markets (billions of US dollars) in recession years versus recovery years for the 1970-1999 period. The picture shown in the top panel of Figure 1 reveals that net flows to emerging markets are almost twice as large (almost US $60 billion) when the United States is in expansion as when the United States is in recession. Furthermore, this vast gap between recession and expansion owes primarily to a surge in FDI flows (which go up nearly fivefold from recession to expansion) and to portfolio flows (Figure 2, top panel). Indeed, other *net inflows* to emerging markets fall from about US $17 billion when the United States is in recession to about US $8 billion of *net outflows* in expansions (Figure 2, bottom panel). This disparate behavior between FDI and portfolio flows on the one hand and other flows on the other hand is not as paradoxical as it appears on the surface. FDI targeted at supplying both final and intermediate goods to the U.S. market can be expected to slow down. Furthermore, as noted earlier, bank lending accounts for a significant part of other flows and banks tend to seek lending opportunities abroad when the domestic demand for loans weakens, as it usually does during recessions. The U.S. bank lending boom to Latin America in the late 1970s and early 1980s and the surge in Japanese bank lending to emerging Asia in the mid-1990s are two clear examples of this phenomenon.

However, the surge in FDI flows from the mid-1990s to the present is a significant departure from FDI's historical behavior and it is, no doubt, heavily influenced by the wave of privatizations and mergers and acquisitions that took hold in many emerging markets during recent years. Hence, it is plausible to expect that some of this surge in FDI is non-recurring. Yet, during this period of privatizations and surging FDI, the United States is enjoying its longest economic expansion, which may skew the results toward finding an exaggerated role for U.S. growth in driving FDI and total net flows. To examine whether the "anomalous" FDI surge of the 1990s is responsible for these results, we ended our sample in 1992, which is two years following the only U.S. recession in the 1990s. The results paint a somewhat different picture: capital flows to emerging markets do not increase as much during economic upturns in the United States. While FDI flows and portfolio flows continue to be markedly higher in

[8] Details on the individual series and country coverage are provided in the Data Appendix.

expansions than in recessions, the drop in other flows during expansions almost fully offsets this tendency.

Indeed, truncating the sample reveals that, while FDI and portfolio flows do appear positively related to the U.S. economic cycle (as before), the impact of the economic cycle on these components of private flows is somewhat smaller than that suggested by Figures 1 and 2. Yet, the countercyclical behavior of other flows in the smaller sample remains consistent with the results for the entire period. Splitting the sample into years in which U.S. real GDP growth is above the median growth rate for the sample and those in which growth is below the median reveals a similar pattern.

In sum, from the vantage point of the volume of capital flows to emerging markets, U.S. recessions are not obviously a bad thing. From a compositional standpoint, however, the more stable component of capital flows, FDI, does seem to contract during downturns in the United States, suggesting that emerging markets may wind up during these periods relying more heavily on less stable sources of financing, such as short-term flows.[9]

The Growth Cycle and Trade

If economic downturns in the United States are not necessarily a bad thing from the vantage point of the availability of international lending to emerging markets, slowdowns are likely to have adverse consequences for countries that rely heavily on exports to the United States. Table 2 reports the exports (as of 1999) of various emerging markets in Africa, Asia, and the Western Hemisphere that are destined for the United States market, both as a share of total exports (column 1) and as a share of GDP (column 3).

It is evident that bilateral trade links between the United States and the developing world are generally strongest for Latin America, although there is considerable variation within the region, with Mexico and Argentina at the two ends of the spectrum. However, trade between the United States and the Asian countries shown in this table is also substantial because of their larger degree of openness. Furthermore, these numbers underestimate the relative impact on Asian countries on account of the content of their exports, because the income elasticity in developed economies for Asian exports is more than twice as large as the income elasticity for African exports. More generally, the elasticity of developing countries that are major exporters

[9] Other flows are mostly short-term.

of manufactures is well above that of those whose exports have a higher primary commodity content.

As noted earlier, swings in the economic cycle in the United States and other major industrialized economies have had a systematic impact on the terms of trade of primary-commodity exporters. According to the various studies reviewed in Table 4, a one percentage point drop in industrial production growth in the developed economies results in a drop in real commodity prices of roughly 0.77 to about 2 percent, depending on which study is considered.

Table 2. United States and Developing Country Trade Patterns, 1999

Region/Country	Exports to the U.S. as share of total exports (in percent)	Ratio Exports to GDP (PPP) 1998	Exports to the United States as a share of GDP (in percent)
Latin America			
Mexico	88.3	16.7	14.7
Venezuela	55.4	14.1	7.8
Chile	19.4	16.7	3.2
Colombia	50.3	5.9	2.9
Peru	29.3	7.1	2.1
Brazil	22.5	5.3	1.2
Argentina	11.3	7.2	0.8
Asia			
Singapore	19.2	168.1	32.3
Malaysia	21.9	45.9	10.1
Korea	20.6	25.0	5.2
Thailand	21.5	19.7	4.2
Philippines	29.6	13.6	4.0
Indonesia	16.1	9.4	1.5
China Mainland	21.5	5.4	1.2
Africa			
Congo, Rep.	19.0	44.7	8.5
South Africa	8.2	9.8	0.8
Zimbabwe	5.8	9.3	0.5
Kenya	4.6	9.9	0.5
Chad	7.2	5.3	0.4
Ethiopia	8.4	2.9	0.2
Uganda	5.4	3.1	0.2
Mozambique	4.8	3.4	0.2

Source: Direction of Trade Statistics, International Monetary Fund (2000). World Development Indicators Database (2000), World Bank.

Table 3. Industrial Countries' Demand for Developing Country Exports

Study and Sample Period	Importing country	Exporting country	Income Elasticity
Dornbusch (1985), 1960-1983		All non-oil developing	1.74
		Major exporters of manufactures	2.67
Márquez (1990)	Canada	Non OPEC developing	2.83
	Germany	Non OPEC developing	2.29
	Japan	Non OPEC developing	1.22
	United Kingdom	Non OPEC developing	1.45
	United States	Non OPEC developing	3.04
	Rest of OECD	Non OPEC developing	2.61
Reinhart (1995), 1970-1991	All developed	All developing	2.05
		Africa	1.25
		Asia	2.49
		Latin America	2.07

Table 4. Commodity Prices and Economic Cycles: A Review

Study	Dependent variable/sample period	Measure of developed-country growth rate used	Coefficient the developed country growth rate
Borensztein and Reinhart (1994)	All commodity index/ 1971:1-1992:3, quarterly	Industrial production for developed economies	1.40
	All commodity index/ 1971:1-1992:3, quarterly	Industrial production for developed economies plus GDP for the Former Soviet Union	1.54
Chu and Morrison (1984)	All commodity index/ 1958-1982, quarterly	GDP weighted industrial production-G-7 countries	1.66
Dornbusch (1985)	All commodity index/ 1970:2-1985:1, quarterly	OECD industrial production	2.07
Holtham (1988)	All commodity index/ 1967:2-1982:2, semiannual	GDP growth for the G-7 economies	0.51
		Industrial production for the G-7 economies	0.77

We conducted the same exercise as for capital flows for emerging market average annual GDP growth. As shown in Table 5, for all developing countries, growth is somewhat slower during U.S. recessions, averaging 4.8 percent per annum versus 5.2 percent average growth during expansion years. However, the pattern is uneven across regions. For the countries in transition, Asia (including the newly-industrialized economies), and the Middle East and Europe growth tends to slow during U.S. recessions, while for Africa and the Western Hemisphere, the opposite is true. However, in most instances the differences across regimes are not markedly different—an issue we will explore further later.

Table 5. Economic Growth and the U.S. Business Cycle, 1970-1999
Average Annual Real GDP Growth (in percent)

Major Regional Groupings	Entire Period	During U.S. Recessions	During U.S. Expansions
Newly Industrialized Asian Economies	7.68	7.11	7.79
Developing Countries	5.08	4.82	5.21
Western Hemisphere	3.69	3.81	3.58
Africa	2.91	3.29	2.77
Asia	6.57	6.25	6.69
Middle East and Europe	4.43	4.31	4.52
Countries in Transition	1.51	2.71	0.88

Source: World Economic Outlook, International Monetary Fund.
Notes: Recessions and expansions are dated according to the National Bureau of Economic Research's dating of U.S. business cycle turning points; if six or more months of a given year fall into the recession category, then that year is labeled a recession year.

The Interest Rate-Monetary Policy Cycle

As noted earlier, in a world of countercyclical monetary policy in industrial countries, it is difficult to talk about an economic cycle without analyzing the consequences of the interest rate cycle that, more often than not, goes hand in hand with economic fluctuations. As with the growth cycle, we proceed to describe the stylized evidence by breaking up the sample in two ways. First, we subdivide the 1970-1999 sample into two subsamples, one in which monetary policy was "easing"—that is to say that the federal funds rate was declining—and periods of tightening, when the federal funds rate is rising. However, this cut of the data does not discriminate between modest and marked policy changes, as a 50 basis point drop in the federal

funds rate during a given year would be lumped together with a 400 basis point drop. To get at this issue, we also break the sample into periods when real interest rates are above the sample median and those years when rates are below the median.[10]

Figures 3 and 4 show the results of this exercise. Irrespective of whether the observations are split along the lines of rising versus falling interest rates or interest rate levels above or below their median, or whether the sample ends in 1999 or 1992, the outcomes are consistent. In years when U.S. monetary policy is easing (i.e., the federal funds rate is declining), emerging markets in all regions receive a markedly higher volume of capital inflows. While FDI and portfolio flows do not change much, other (short-term) flows respond markedly to the interest rate cycle.[11]

Table 6. Economic Growth and U.S. Monetary Policy, 1970-1999

Average Annual real GDP Growth (in percent)

Major Regional Groupings	Entire Period	During U.S. Tightenings	During U.S. Easings
Newly Industrialized Asian Economies	7.68	8.79	6.93
Developing Countries	5.08	5.17	5.02
Western Hemisphere	3.69	4.21	3.34
Africa	2.91	2.63	3.10
Asia	6.57	6.72	6.46
Middle East and Europe	4.43	3.87	4.80
Countries in Transition	1.51	2.96	0.65

Source: World Economic Outlook, International Monetary Fund.
Notes: Easing/tightening are those years that the Federal Funds rate declined/rose, respectively.

[10] Our real interest rate measure is constructed by taking the three-month U.S. Treasury bill rate and subtracting the consumer price inflation rate for that year.

[11] The surge in net private inflows is even more dramatic when the sample is split according to whether real interest rates are above or below their sample median. As before, Africa is the only region unaffected by the interest rate cycle in the United States.

4. Assessing the Impact of the "North's" Business and Interest Rate Cycles: A First Cut

In the preceding section, we discussed the stylized evidence on capital flows, growth and U.S. developments. In what follows, we take that analysis further by examining the interaction between the "twin" monetary policy-growth cycles and capital flows and its components.

Stylized Evidence on the Twin Cycles

Table 7 cuts the sample into four states of nature for the United States: recession accompanied by monetary policy tightening, recession accompanied by easing, expansion and tightening, and expansion and monetary policy easing.[12] Our priors as regards emerging markets growth are straightforward: high U.S. growth and easier monetary policy would provide the best conditions for more rapid growth in emerging markets. As for capital flows, the priors are less well defined. The Calvo, Leiderman, and Reinhart (1993) hypothesis would suggest that tighter monetary policy (i.e., rising interest rates) would lead to (other things being equal) lower capital flows to emerging markets. On the other hand, while recessions in the North may dampen FDI flows (as these are often linked to trade), economic slowdowns tend to be accompanied by a weakening in the domestic demand for loans—which, in the past, has often led banks to seek lending opportunities abroad. In other words, the consequences of the U.S. cycle for capital flows are, in principle, ambiguous.

Table 7 presents net capital flows and their components to all emerging markets during these four states of nature. As the top panel indicates, net flows more than double along the diagonal, suggesting that both lower interest rates and faster growth in the United States are a potential catalyst for capital flows into emerging markets. However, as the previous discussion suggested, this feature is not even across categories. FDI and portfolio flows thrive when expansions are coupled with falling interest rates. Other flows, which are largely comprised of bank lending, do not. Like other flows, these tend to increase in periods of falling interest rates but contract during expansions; other flows are highest when the U.S. is in recession and interest rates are falling.

[12] The recession years are based on NBER dates, while the monetary policy cycle is split into years in which the federal funds rate is declining and those in which it is rising.

Table 7. Real Capital Flows and the Twin Cycles: All Emerging Market Economies

(Billions of 1970 U.S. dollars)

Net Private Capital Flows		Recession	Expansion
	Tightening	8.6	13.2
	Easing	13.9	19.3
Net Private Direct Investment			
	Tightening	3.4	11.0
	Easing	4.2	11.5
Net Private Portfolio Investment			
	Tightening	0.2	4.0
	Easing	1.5	6.6
Other Net Private Capital Flows			
	Tightening	5.0	1.8
	Easing	8.4	1.2

Source: World Economic Outlook, International Monetary Fund.
Notes: Recessions and expansions are dated according to the National Bureau of Economic Research's dating of U.S. business cycle turning points; if six or more months of a given year fall into the recession category, then that year is labeled a recession year. Easing/tightening are those years that the Federal Funds rate declined/rose.

Basic Tests

However, the preceding discussion does not shed light on the relative statistical significance of the twin cycles. To address that issue, we next run a variety of simple regressions that attempt to explain capital flows and growth in emerging markets through developments in the developed economies, particularly the United States. Our sample spans 1970-1999 for all regions except the Western Hemisphere, where the debt crisis (1981-1986) period is excluded.[13]

The dependent variable is a real private capital flow measure, which includes four categories: Net capital flows, net direct investment, net portfolio flows, and other capital flows. The regressors in the first set of panel regressions are real U.S. GDP growth and the U.S. real interest rate. Neither of these variables poses a potential endogeneity problem, since both are

exogenous to other factors affecting developing country growth. Our estimation method is a simple OLS. Table 9 reports the results of this regression for all emerging market economies as well as for particular regions.

Table 8. U.S. Determinants of Real Capital Flows: 1970-1999

	Dependent variable:	Independent Variables:		
Total Emerging Market Economies		U.S. Real GDP Growth	U.S. Interest Rates[1]	R^2
	Net Capital Flows	-1.09 (1.11)	-2.32 (0.96)	0.18
	Net Direct Investment	0.26 (0.88)	-1.57 (0.76)	0.16
	Net Portfolio Investment	-0.33 (0.57)	-1.26 (0.50)	0.19
	Other Net Capital Flows	-1.06 (0.88)	0.50 (0.71)	0.09

Notes: Standard errors are in parentheses.
[1] Nominal 3-month U.S. Treasury bill rate.

As shown in Table 8, when examining the results for the emerging market aggregate as well as for most of the regional subgroups, the results that predominantly emerge are that U.S. interest rates play a more dominant and systematic role in explaining capital flows to emerging markets than U.S. economic growth; rising U.S. interest rates are associated with falling capital flows to emerging markets. In effect, in many of the regressions the coefficient on growth is negative, suggesting that when the U.S. is enjoying rapid growth capital stays at home. This effect is most pronounced in Other Net Flows, which largely consists of bank lending. Both FDI flows and portfolio flows are consistently interest rate-sensitive.[14]

There are, however, various regional differences worth highlighting.[15] First, U.S. real interest rates are significant in explaining portfolio and FDI flows in all regions—but the impacts of real interest rates are greatest in the Western Hemisphere and lowest in Africa. This result may simply highlight that, among the emerging markets with some extent of access to

[13] During the Latin American debt crisis bank lending behavior was dominated by debt restructuring; thus the evolution of bank lending during this period is markedly different from the remainder of the sample.
[14] Similar results obtain, when developed-country real GDP growth rates are used in lieu of the U.S. growth rate. These results are not reported but are available from the authors.

international capital markets (Asia and Latin America), the latter are more heavily indebted and interconnected with the United States. Second, growth in the United States has a significant and positive influence in explaining FDI to the Western Hemisphere, which is not the case for other regions. Third, as the descriptive analysis anticipated, the other capital flow category behaves very differently from FDI and portfolio flows.

We next perform a comparable exercise for growth. In assessing the links between developing debtor countries and their developed counterparts, Dornbusch (1985) performed a similar exercise. The dependent variable was developing country GDP growth (as is the case here) while the independent variable was a measure of OECD growth.[16] He found the coefficient on the OECD growth measure to be statistically significant and in the 0.28-0.76 range. More recently, Frankel and Roubini (2000) regress developing country growth for various regional groupings against the G-7 real interest rate; they found that the coefficients on real interest rates were negative and in most cases statistically significant, with the greatest interest sensitivity in the Western Hemisphere.[17]

Our exercise here combines these two approaches. As shown in Table 9, when GDP growth for the various country groupings is regressed against U.S. growth and the level of U.S. real interest rates, the results tend to be quite intuitive. The sensitivity of growth to U.S. growth is highest (and statistically significant) for the newly industrialized Asian Economies which depend importantly on trade with the United States (followed by the Western Hemisphere), and lowest for the remainder of Asia. For all developing countries, both of the regressors have the anticipated signs and are statistically significant. A one percentage point decline in U.S. growth rates reduces GDP growth for the developing countries by 0.23 percent while a one percent increase in U.S. real interest rates reduces it by 0.27 percent. Because of (probably) strong trade links with the United States for most countries in the region, U.S. growth is statistically significant for the Western Hemisphere, and the coefficient is positively signed. U.S. growth is also significant for the Middle East and European developing countries. Given its history of relatively high levels of indebtedness and periodic debt-servicing difficulties, it is not surprising that the U.S. real interest rate is significant and growth is the most sensitive to interest rate fluctuations in the Western Hemisphere; the coefficient (-0.81) is almost three times as large, in

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[15] This discussion is based on Appendix Tables 1-2.

[16] He used industrial production, real GDP growth, and import volume alternatively; the sample was 1961-84.

absolute terms, as for all developing countries. Indeed, one cannot reject the hypothesis that a 1-percent increase in U.S. real interest rates leads to a 1-percent decline in growth in the region. Real U.S. interest rates are also statistically significant for the Middle East and Europe. At the other end, among the newly industrialized Asian economies, with low levels of external debt and uninterrupted access to private capital markets, U.S. interest rates are not significant, although the coefficient has the (expected) negative sign. As far as these regressions are concerned, U.S. developments have no systematic relationship with the rest of developing Asia or the transition economies.

Table 9. Developing Country Growth and U.S. Developments

Country Group	Independent variables		
	U.S. GDP growth	U.S. Real Interest Rate	R^2
Newly Industrialized Asian Economies	0.58 (0.26)	-0.21 (0.24)	0.16
Developing Countries	0.23 (0.11)	-0.27 (0.10)	0.25
Western Hemisphere	0.42 (0.17)	-0.81 (0.16)	0.51
Africa	0.07 (0.16)	-0.17 (0.15)	0.04
Asia	-0.02 (0.18)	0.20 (0.17)	0.05
Middle East and Europe	0.50 (0.28)	-0.56 (0.27)	0.18
Countries in Transition	0.37 (0.46)	-0.33 (0.44)	0.03

Notes: Standard errors are in parentheses.

5. Concluding Remarks

In this paper, we have not attempted to predict the fate of the U.S. economy but rather to analyze and quantify how developments in the United States have affected emerging market economies in the past. As regards the impact of the U.S. economic and interest rate cycle, our main findings can be summarized as follows.

[17] The coefficient for the Western Hemisphere was -0.77 compared to -0.39 for all market borrowers.

Recessions in the United States are associated with a lower volume of capital flows to emerging markets; FDI flows are particularly sensitive to the growth cycle. Other capital flows (which include bank lending and capital flight), however, behave countercyclically—banks seek to lend abroad as U.S. loan demand weakens during recessions. This offset has, at least historically, cushioned the blow.

Other things being equal, lower U.S. real GDP growth is also associated with lower growth in developing countries. The difference in U.S. GDP growth rates between expansion and recession years is 3.3 percent.[18] Hence, in an "average" U.S. recession, the slowdown alone would shave about 3/5 percent off growth in developing countries' GDP growth (Table 10). However, some regions like the Western Hemisphere and the newly industrialized economies of Asia would be hit harder.

Table 10. U.S. Growth and Interest Rates in Recessions and Expansions and Implications for Developing Country Growth
(in percent)

U.S. GDP Growth Average During:			U.S. Real Interest Rate Average During:		
Expansion (1)	Recession (2)	Difference (3)=(1)-(2)	Expansion (4)	Recession (5)	Difference (6)=(4)-(5)
4.1	0.8	3.3	1.9	0.5	1.4

Developing Country Growth and the U.S. Growth and Interest Rate Channels			
Country Grouping	U.S. Growth effect	Interest rate effect	Combined effect
Newly Industrialized Asian Economies	-1.914	0.294	-1.62
Developing Countries	-0.759	0.378	-0.381
Western Hemisphere	-1.386	1.134	-0.252
Africa	-0.231	0.238	0.007
Asia	0.066	-0.28	-0.214
Middle East and Europe	-1.65	0.784	-0.866

[18] Recession years are dated according to the NBER criteria.

But other things are not equal, and nominal and real interest rates usually fall during recessions as the Federal Reserve attempts to revive the economy. Real interest rates typically fall by about one-and-half percent during recessions, which translates (other things equal) to about half a point boost to real GDP growth for the all developing country category (Table 11) and considerably more for the relatively indebted nations of the Western Hemisphere (which maintain access to international capital markets).

However, "double-whammies," recessions coupled with tight money, are unambiguously terrible news for the developing world. Total capital flows to emerging markets are less than one half their level of the "boom" (expansions coupled with easings). The interest rate cycle and monetary policy cycle are mutually reinforcing, with amplified consequences for growth. Indeed, the last double whammy in our sample sets the stage for the debt crisis in Latin America and elsewhere in the early 1980s. The probability of a double whammy has, at least historically, been tied to the inflation performance of the United States. A banking or financial crisis in the United States could conceivably lead to the same outcome.

Finally, if FDI is the most stable and desirable of capital flows from an emerging market perspective, and if international bank lending is volatile and more prone to sudden reversals (as was the case with Japanese bank lending to emerging Asia during the crisis), then a recession in the United States has, at least historically, resulted in a "deterioration" in the composition of the capital flows emerging markets receive. FDI shrinks in recessions while bank lending fills up some of that space.

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Appendix Table 1. U.S. Determinants of Real Capital Flows: 1970-1999

Country Group		Independent variables		
			1	2
	Net Capital flows	0.04 (0.19)	0.21 (0.17)	0.06
	Net Direct Investment	0.00 (0.04)	-0.07 (0.03)	0.15
	Net Portfolio Investment	0.04 (0.05)	-0.09 (0.04)	0.21
	Other Net Capital Flows	0.00 (0.20)	0.37 (0.18)	0.15
Other Asian Emerging Markets				
	Net Capital flows	-0.06 (0.31)	-0.26 (0.27)	0.03
	Net Direct Investment	0.07 (0.31)	-0.64 (0.27)	0.19
	Net Portfolio Investment	-0.04 (0.06)	-0.04 (0.05)	0.03
	Other Net Capital Flows	-0.09 (0.28)	0.42 (0.25)	0.11

Notes: Standard errors are in parentheses.

[1] Nominal 3-month U.S. Treasury bill rate.

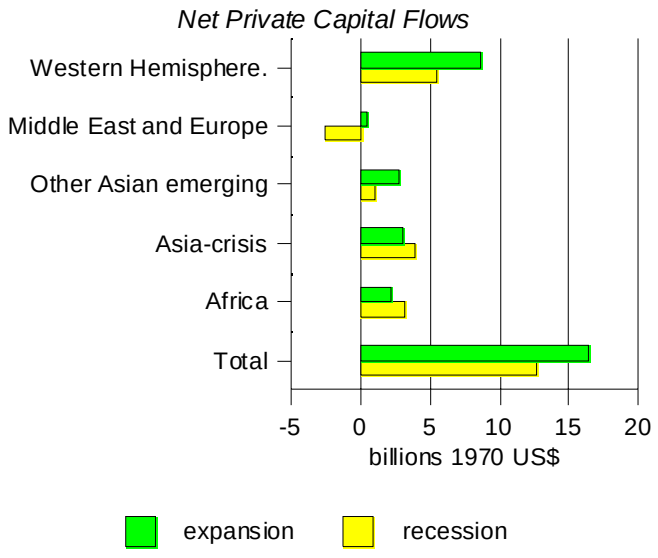
Appendix Table 2. U.S. Determinants of Real Capital Flows: 1970-1999

Country Group		Independent variables		
Asia, Crisis Countries	Dependent Variable	U.S. GDP growth	U.S. Interest Rate[1]	2
	Net Capital flows	-0.42 (0.39)	0.05 (0.34)	0.05
	Net Direct Investment	0.02 (0.06)	-0.12 (0.06)	0.15
	Net Portfolio Investment	-0.05 (0.15)	-0.25 (0.13)	0.13
	Other Net Capital Flows	-0.35 (0.29)	0.43 (0.29)	0.18
Middle East and Europe				
	Net Capital flows	-0.25 (0.54)	-1.68 (0.46)	0.33
	Net Direct Investment	0.08 (0.08)	-0.07 (0.08)	0.11
	Net Portfolio Investment	-0.06 (0.14)	0.02 (0.12)	0.01
	Other Net Capital Flows	-0.27 (0.46)	-1.63 (0.40)	0.39
Western Hemisphere				
	Net Capital flows	0.70 (0.91)	-2.71 (0.85)	0.53
	Net Direct Investment	1.69 (0.84)	-0.93 (0.79)	0.36
	Net Portfolio Investment	0.03 (0.81)	-2.60 (0.75)	0.55
	Other Net Capital Flows	-0.97 (0.89)	0.83 (0.83)	0.20

Notes: Standard errors are in parentheses.

[1] Nominal 3-month U.S. Treasury bill rate.

Figure 1. Real Capital Flows to Emerging Markets and the U.S. Business Cycle, 1970-1999



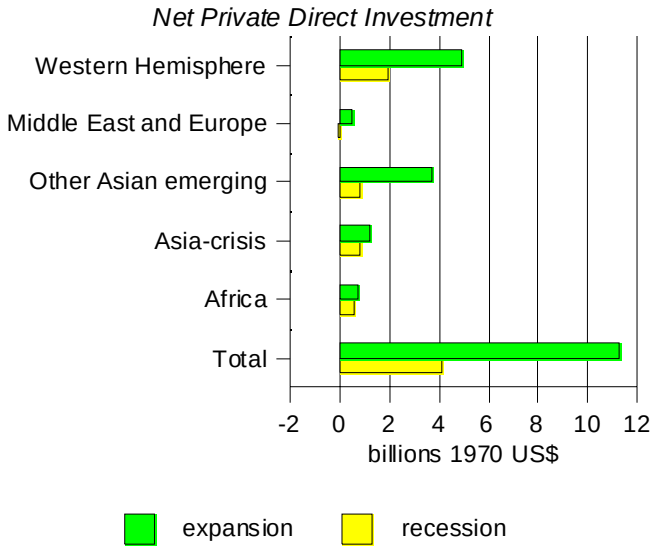
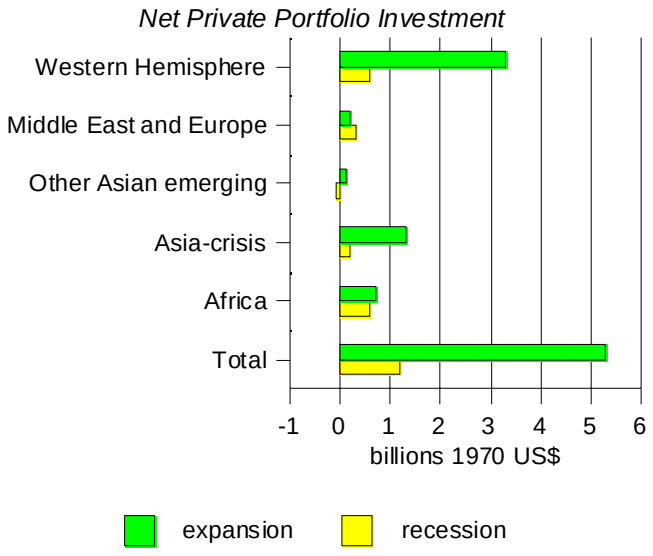


Figure 2. Real Capital Flows to Emerging Markets and the U.S. Business Cycle 1970-1999 (continued)



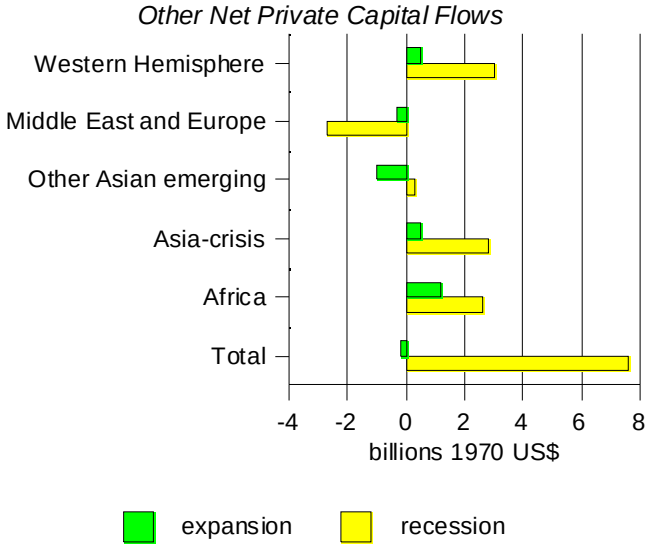
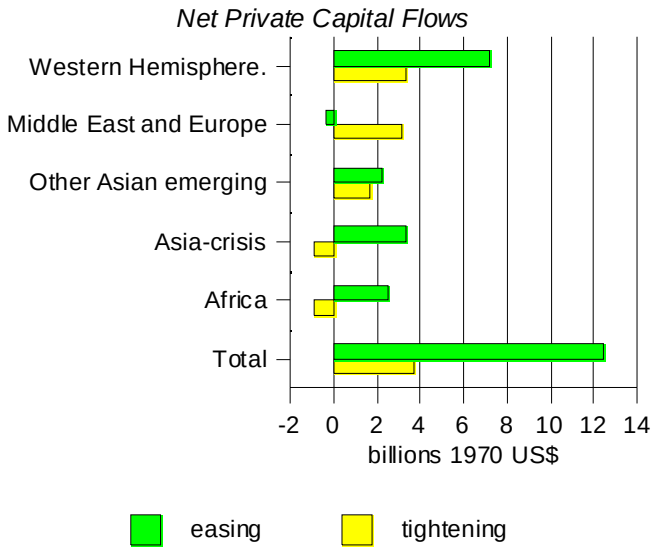


Figure 3. Real Capital Flows to Emerging Markets and the U.S. Monetary Policy Cycle, 1970-1999



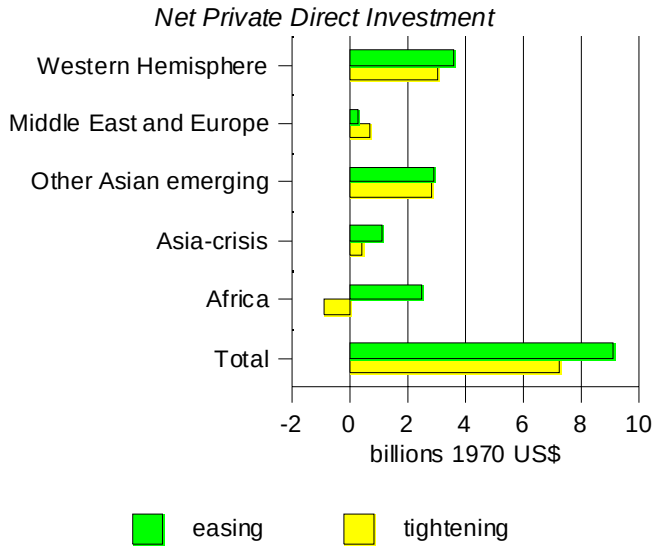
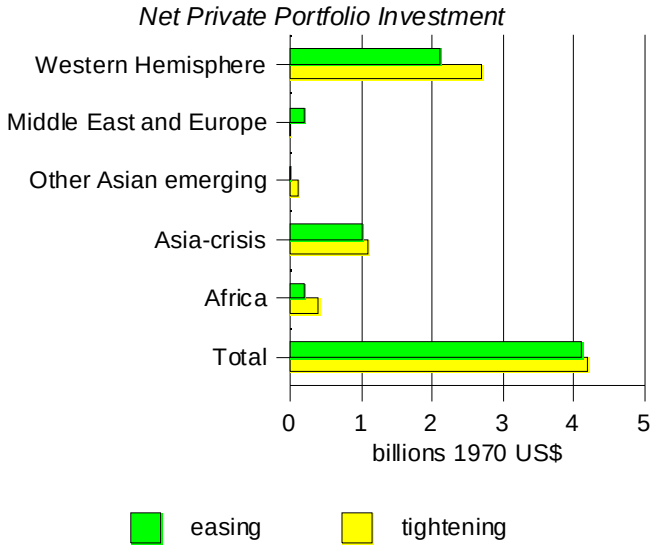
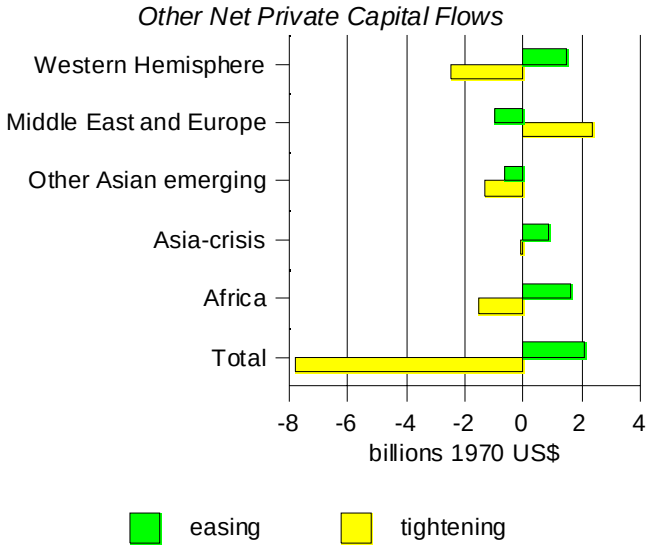



Figure 4. Real Capital Flows to Emerging Markets and the U.S. Monetary Policy Cycle, 1970-1999 (continued)