WP/97/13

INTERNATIONAL MONETARY FUND

Research Department and IMF Institute

Patterns of Capital Flows to Emerging Markets: A Theoretical Perspective

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January 1997

Abstract

This paper reviews some of the basic patterns of international capital flows to emerging markets in recent years, including the composition of capital flows, intraregional flow patterns, and the geographical distribution of the flows. A theoretical model that sheds new light on these observed patterns is developed. This model focuses on the cost of financing aspect of capital flows, and shows that the patterns of capital flows are influenced by the combined effects of financial market development and growth potential in the recipient countries. The theoretical predictions of the model are shown to be consistent with the stylized facts.

Contents

SUMMARY

This paper reviews some of the basic patterns of international capital flows to emerging markets in recent years, which include the composition of capital flows, intraregional flow patterns, and the geographical distribution of the flows. While there is a large body of literature on capital flows, there is as yet no widely-accepted explanation for why the volume and composition of capital flows differ among the various emerging-market countries.

Many factors can affect the patterns of capital flows. This paper focuses on the cost of financing aspect and shows how capital flows are affected primarily by the level of financial market development and the growth potential in the recipient countries. The theoretical model developed in this study offers a simple unifying framework to explain the various patterns of capital flows.

In the model, the level of financial market development is captured by the market's ability to alleviate capital market inefficiencies, such as asymmetric information concerning investments. Growth potential is defined by the distribution of investment opportunities in the recipient country. Foreign residents' incentive to invest in emerging markets is related to the expected excess return to foreign investment, which depends on the recipient country's level of financial market development and growth potential. The model predicts positive expected excess returns to foreign portfolio equity investment in countries exhibiting a suitable combination of financial market development and growth potential, while for other countries such excess return is negative. In some countries, under slight changes in perceived growth potential or financial market integrity, the expected excess returns can turn from positive to negative, or vice versa, leading to large-scale capital flow reversals, as have been witnessed recently in international capital markets. In countries where growth potential is high but the financial market is underdeveloped, foreign direct investments could be a preferred form of inflow, relative to portfolio inflows.

I. INTRODUCTION

Capital flows to developing countries and transition economies have grown rapidly since the early 1990s, reaching US$228 billion in net terms in 1995.[2] The magnitude and volatility of capital flows have presented both opportunities and challenges to the recipient countries, and much has been written about the causes, consequences, and policy implications of capital flows.[3] Nevertheless, some important patterns of capital flows remain largely unexplained.

It is well known that capital flows are affected by many different factors, such as political risk, macroeconomic factors, external factors, regulatory controls, tax incentives, investors' business strategies, and so on. While the effects of these factors have been discussed extensively in the literature, the results of such discussions do not as yet offer a clear consensus as to why the volume, and particularly the composition, of capital flows vary across emerging markets. Basically, to better explain the patterns of capital flows, careful and rigorous analyses need to be undertaken before a synthesis can be developed.

In this paper, we focus on the *financial aspect* of capital flows to emerging markets. In other words, we take all other nonfinancial factors as given, and study how the *cost of financing* to the recipient countries affects the pattern of capital inflows or, alternatively, how the expected excess returns of investing in an emerging market affects foreign investors' decisions. Of course, in a frictionless world, the cost of financing does not arise, and the composition of capital flows does not matter.[4] but in a world with imperfect financial markets—such as those observed in developing countries or in emerging markets—such costs may be quite high. This paper will show how inefficient financial markets, when combined with the countries' growth profiles, can lead to different patterns of capital flows.

The approach taken here is similar in spirit and complimentary to that of Razin, Sadka, and Yuen (1995), who use the cost of financing argument to explain different forms of capital flows. They assume asymmetric information between foreign and domestic investors, and derive the costs of financing for various forms of capital flows. Specifically, they find "green field" foreign direct investment (FDI) to be the least costly, followed by debt flows and then by portfolio equity flows. The reason why "green field" FDI is less costly is that the participation of foreign partners in the management circumvents the costly asymmetric information problem. Unlike Razin, Sadka and Yuen, however, we derive our results from the inefficiency of the domestic financial market itself. Following Chen and Huang (1995, 1996), we model financial market inefficiency as a result of asymmetric information between outside investors who rely on information in the domestic financial market and insiders of the firms. Such information asymmetry

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[2]Based on the IMF World Economic Outlook data base. See Ito and Folkerts-Landau (1996) for more details.

[3]For a recent summary, see Khan and Mathieson (1996).

[4]This is a straightforward extension of the irrelevance principle of Modigliani and Miller (1958).

is typical in an underdeveloped financial market where information is not properly disclosed and processed due to weak, or even nonexistent, accounting and disclosure rules and primitive market infrastructure. A novel feature of the analysis is that private agents are assumed to minimize the impact of asymmetric information through optimal contracts and renegotiation designs, in line with the recent literature on contract and regulation. When such private market efforts have been allowed for, areas of market failure still remain. We then derive the cost of financing based on the foreign investor's required rate of return, which is the expected return conditional on the host country's investment opportunity distribution and the severity of the host country's financial market failure. Our analysis allows us to make several predictions of the patterns of capital flows based essentially on a host country's growth and financial market parameters.

In what follows, we first review recent patterns of capital flows to emerging markets, including the composition of capital flows, intraregional capital flows, the effect of world interest rates on capital flows, and the geographical distribution of capital flows. We then present a theoretical framework that offers some insights to explain the observed patterns. The policy implications of the analysis are discussed in the concluding section.

II. PATTERNS

A. Composition of Capital Flows

Capital flows basically consist of foreign direct investment (FDI), portfolio equity and debt flows, commercial lending, and official flows. Figures 1 and 2 present a breakdown of capital flows to developing countries in Asia and in Western Hemisphere, respectively. There are two notable features in the figures: one is the importance of FDI and the other is the rising share of portfolio flows in the 1990s. Overall, Western Hemisphere developing countries attracted more portfolio flows relative to FDI than Asian developing countries did.

Using data from World Bank World Debt Table, Figures 3 and 4 show that the "medium income countries" experienced more portfolio equity inflows as a percentage of the total capital inflows in recent years than the "low income countries" did. Also, the "low income countries" relied more heavily on official flows.[5] The reliance on official and officially-backed flows is most pronounced for Sub-Saharan Africa, as can be seen in Figure 5.

Why are there different forms of capital flows, and why are some forms of these flows more dominant than others in certain geographical or income groups? Most existing empirical studies on the composition of capital flows do not seem to offer a clear consensus. Typically, the studies examine the composition of capital flows from the standpoint of desirability. For example, it is often argued that FDI is a desirable form of capital flow to the host country, as it may bring in positive externalities, such as technology and management expertise. From the

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[5]For these areas, debt was the dominant form of capital flow in the early period, but its share has declined in the 1990s.

Figure 1. The Composition of Net Capital Flows to Asian Developing Countries, 1977-95
(In billions of U.S. dollars)
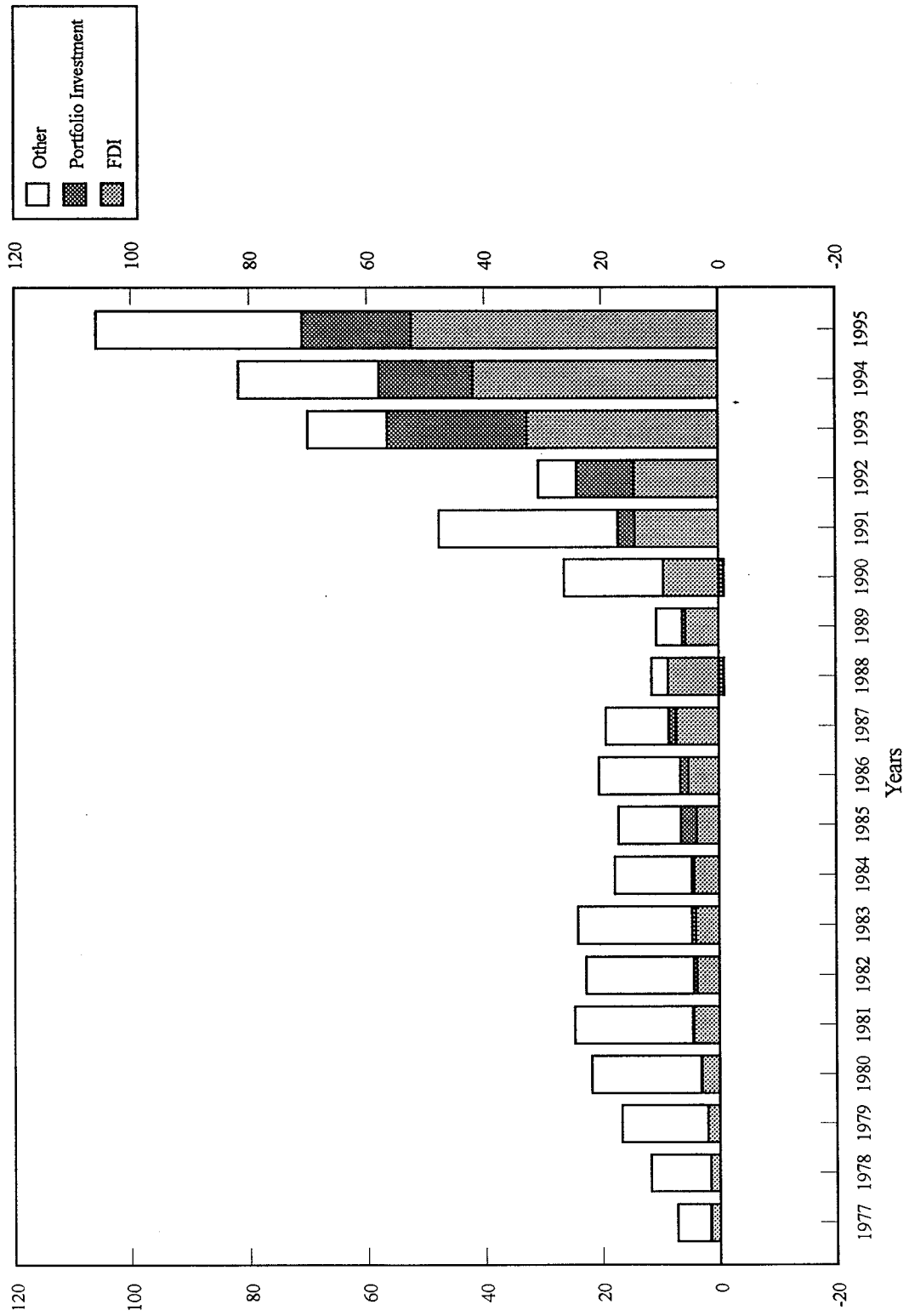
Source: International Monetary Fund: World Economic Outlook data base.

Figure 1. The Composition of Net Capital Flows to Asian Developing Countries, 1977-95

Figure 2. The Composition of Net Capital Flows to Western Hemisphere Developing Countries, 1977-95

(In billions of U.S. dollars)
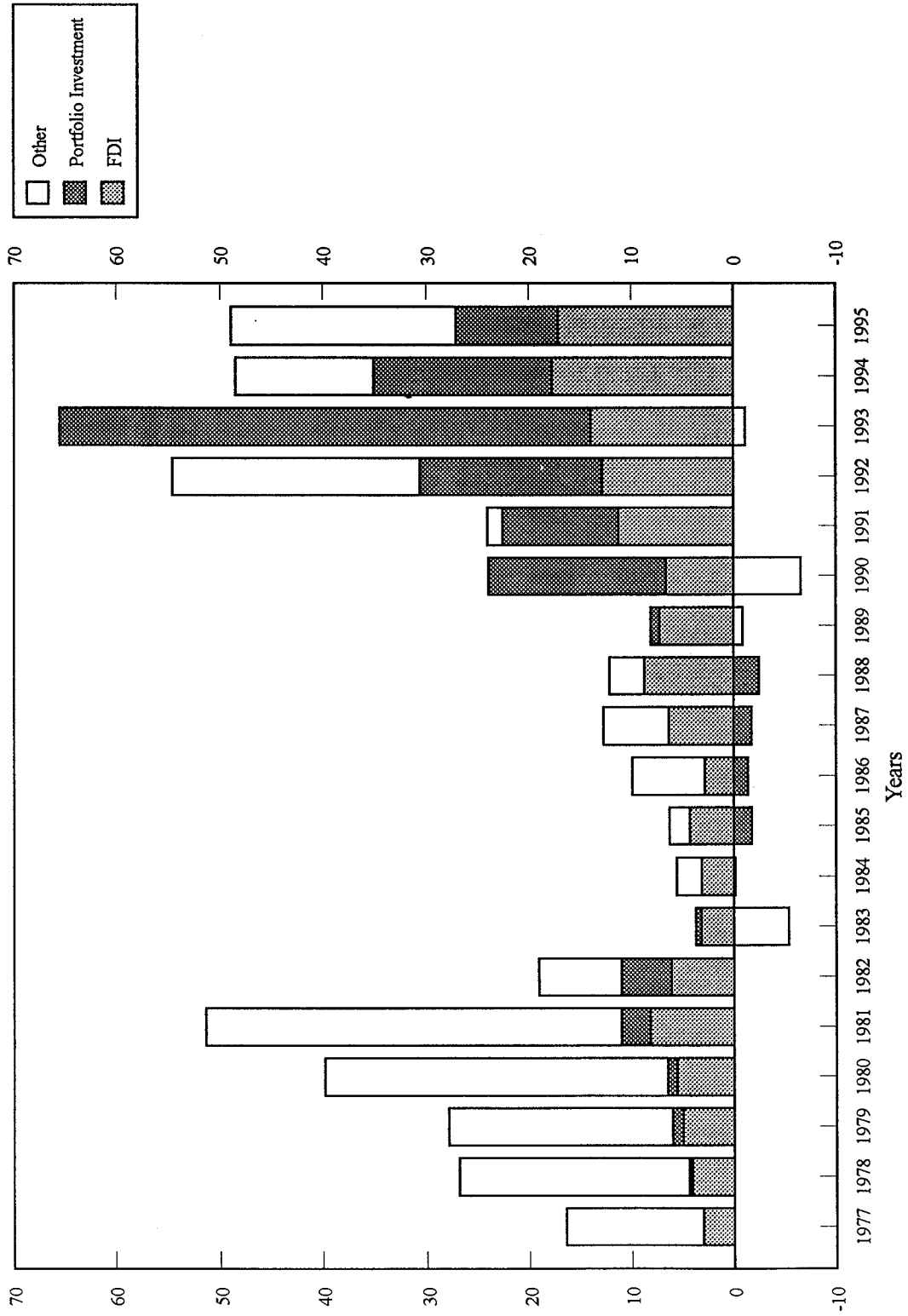
Source: International Monetary Fund: World Economic Outlook data base.

Figure 2. The Composition of Net Capital Flows to Western Hemisphere Developing Countries, 1977-95

Figure 3. Composition of Capital Flows: Medium Income Countries, 1980-95 1/
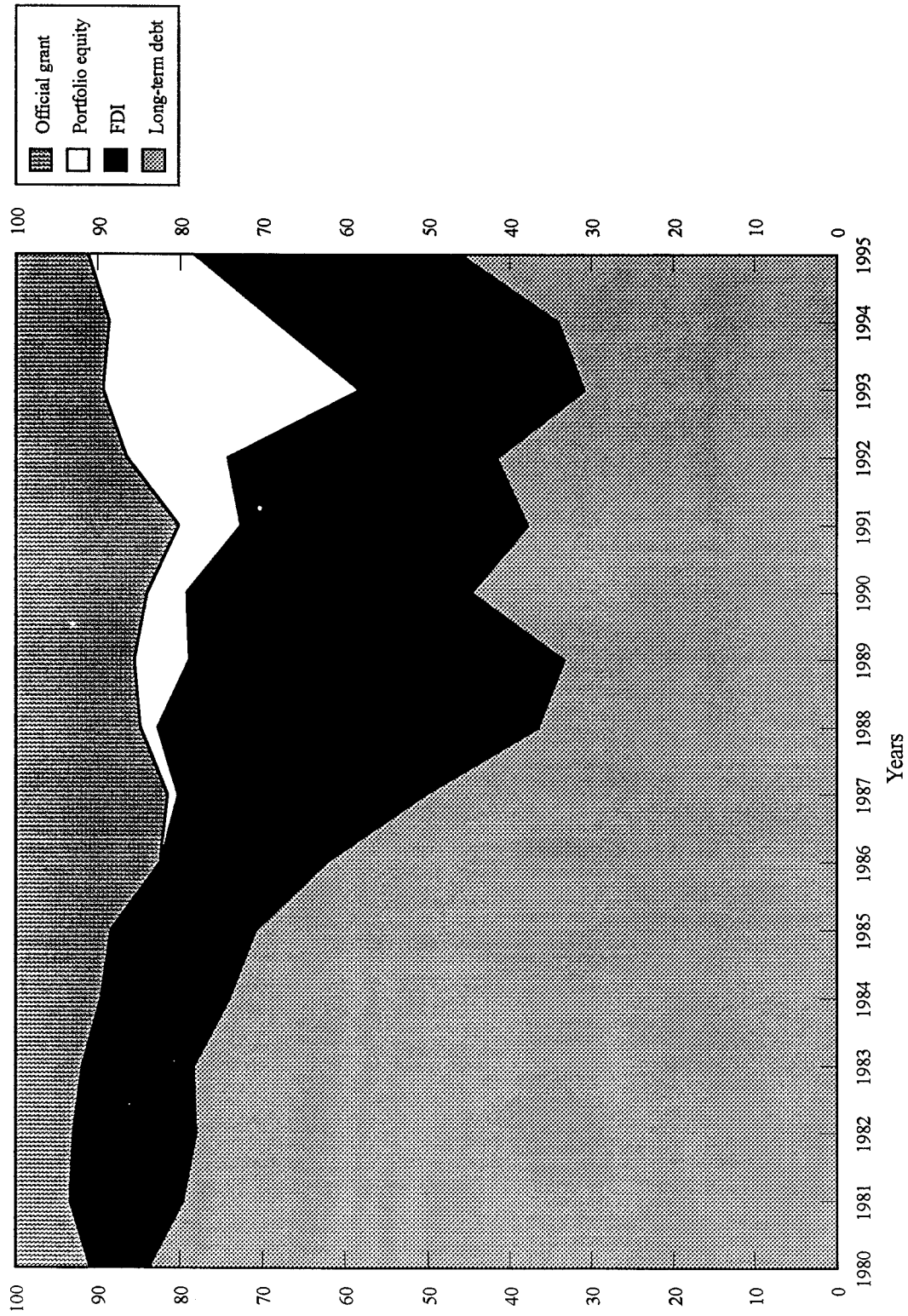
(In percent)

Source: The World Bank: World Debt Tables.
1/ 1995 figures are estimates.

Figure 3. Composition of Capital Flows: Medium Income Countries, 1980-95

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Figure 4. Composition of Capital Flows: Low Income Countries, 1980-95 1/
(In percent)

Legend: Official grant, Portfolio equity, FDI, Long-term debt

Years

Source: The World Bank: World Debt Tables.
1/ 1995 figures are estimates.

Figure 4. Composition of Capital Flows: Low Income Countries, 1980-95

Figure 5. Composition of Capital Flows: Sub-Saharan Africa 1980-95 1/
(In percent)
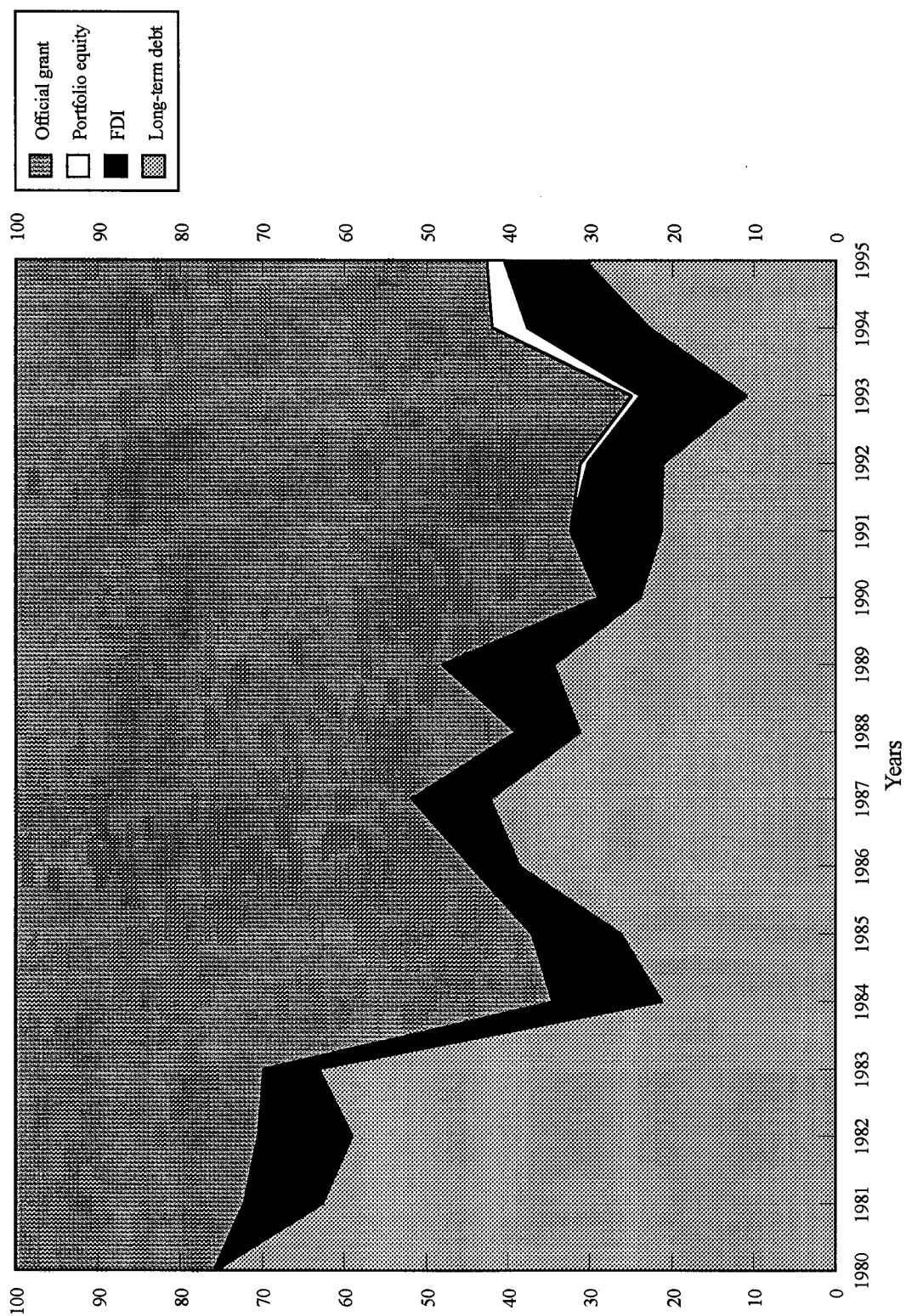
Source: The World Bank: World Debt Tables.
1/ 1995 figures are estimates.

Figure 5. Composition of Capital Flows: Sub-Saharan Africa, 1980-95

foreign investors point of view, FDI may be motivated by strategic considerations in addition to the usual rate of return objectives. Such nonfinancial, strategic concerns include market share and regulations. Portfolio flows, however, are known to be difficult to cope with if the recipient country does not have well-developed macroeconomic policy instruments, or if the economy has fundamental weaknesses, such as a weak banking system (Khan and Reinhart, 1995). There is also a popular perception that portfolio flows are less stable than FDI. Turner (1991) ranks short-term bank lending as the most volatile and long-term bank flows as the least volatile, followed by FDI. Claessens, Dooley and Warner (1995), however, argue that there is no statistical support for the practice of labeling var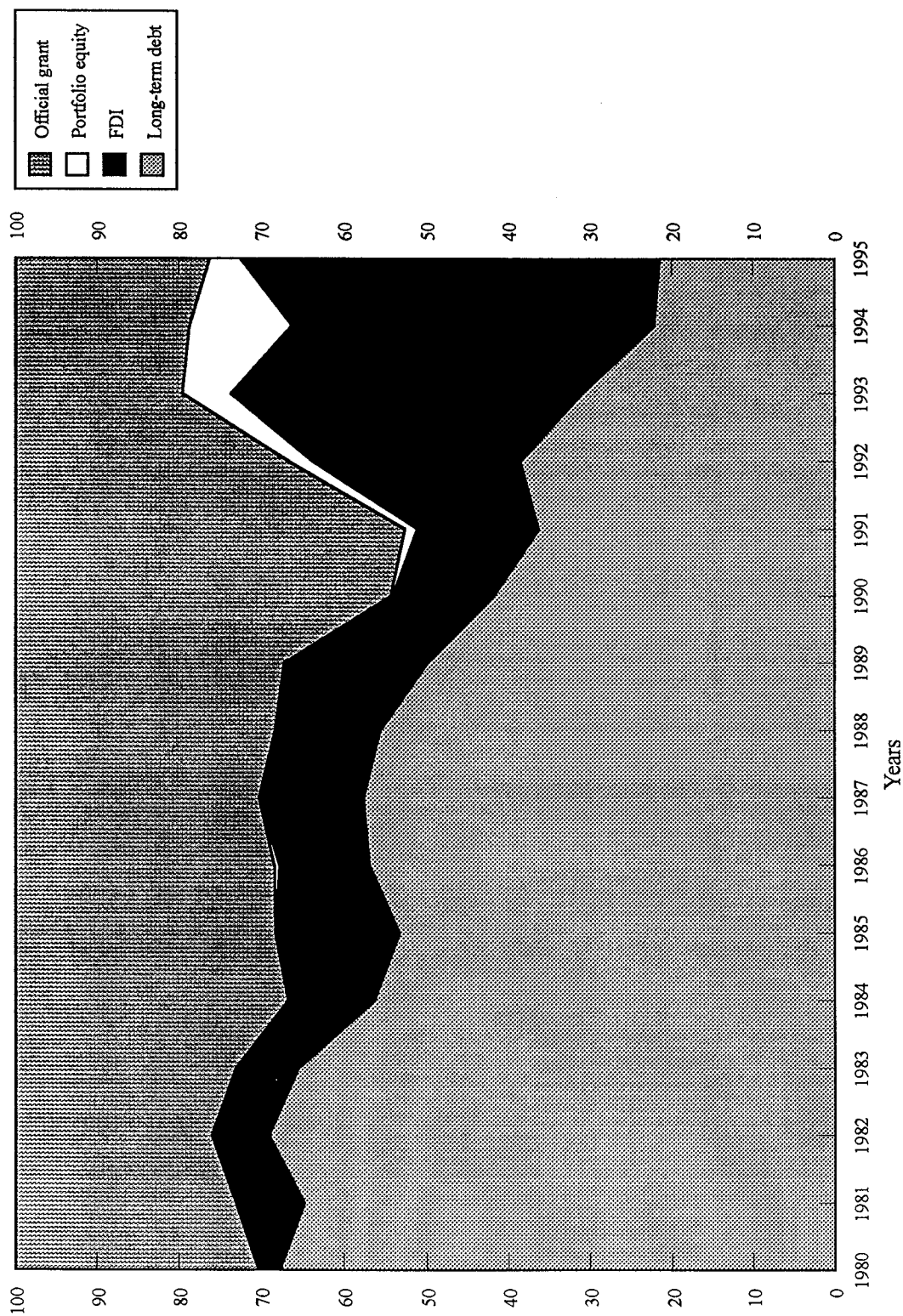ious capital flow components as "hot" or "cold." They find the components to be highly substitutable, with no evidence that a particular component can predict the aggregate flow.

In our analysis, we first derive the cost of portfolio equity financing for countries with different growth and market inefficiency configurations. It follows that foreign portfolio investors would pay a premium to invest in certain countries, while they would require some type of compensation or subsidy in order to invest in other countries. The latter countries are often plagued by financial market inefficiencies. To the extent that other forms of financing, including FDI and debt financing, are less costly for the recipient countries, they will become the preferred forms of financing. For example, a country with a high growth potential that is unable to attract portfolio flows due to its poorly developed financial market infrastructure may find it easier to attract FDI.

B. Intraregional Portfolio Equity Flows

Tables 1 and 2 present the patterns of intraregional equity flows in Latin America and Asia, respectively. While Latin America relied heavily on flows from the United States, Asian developing countries received the majority of their capital inflows from other Asian countries, with far less reliance on the major country in their region, namely, Japan. As a result, Asian developing countries were less vulnerable to sudden reversals of capital flows from Japan than Latin American countries were to the change of heart by U.S. investors. For example, between 1994 and 1995, net portfolio flows to Asian developing countries increased from $16 billion to $18.5 billion despite the drastic reduction of Japanese equity flows to Asia (Figure 6). However, in the same period, portfolio flows to Latin America declined from $17.4 billion to $10 billion, due largely to a sharp reduction of flows from the United States, as shown in Figures 7 and 8.[6]

The newly-industrialized economies (NIEs) in Asia have been playing an increasingly

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[6]The regional groups in Figures 7 and 8 are defined as follows: "Asian NIEs" include Hong Kong, Korea, Singapore, and Taiwan Province of China; "Emerging Asia" includes China, India, Indonesia, Malaysia, the Philippines, and Thailand; "Latin America" includes Argentina, Brazil, Chile, Colombia, Mexico, Uruguay, and Venezuela; "Countries in Transition" includes Bulgaria, Czechoslovakia (as defined in U.S. Tresury Bulletin, 1995 issues), Hungary, Poland, and Russia.

Table 1. Equity Flows to Latin America, 1989-94

(In billions of U.S. dollars)

	1989	1990	1991	1992	1993	1994
Intraregional						
Portfolio investment	0.00	0.00	0.15	0.33	4.72	3.00
Mergers and acquisitions	0.00	0.00	0.00	0.18	0.57	1.10
Tangible assets	(2.37)	(5.90)	4.41	(3.58)	3.46	9.92
United States						
Portfolio investment	0.40	1.04	2.35	7.03	9.27	5.00
Mergers and acquisitions	0.02	0.71	0.79	0.49	2.63	2.71
Tangible assets	8.62	8.74	4.96	13.48	7.66	10.67
Total intra-American flows	**6.67**	**4.59**	**12.66**	**17.93**	**28.31**	**32.40**
Rest of the world						
Portfolio investment	6.60	8.86	8.70	2.24	6.01	6.90
Mergers and acquisitions	0.42	4.78	3.05	5.11	2.14	4.46
Tangible assets	1.47	(1.53)	(1.91)	(1.88)	(0.36)	(2.96)
Total flows	**15.16**	**16.70**	**22.50**	**23.40**	**36.10**	**40.80**
	(As a percent of total equity flows)					
Intra-American	44.0	27.5	56.3	76.6	78.4	79.4
U.S. flows	59.6	62.8	36.0	89.7	54.2	45.1
Tangible assets	50.9	7.8	33.2	34.3	29.8	43.2

Source: Baring Securities

Table 2. Equity Flows to Emerging Asia, 1989-94

(In billions of U.S. dollars)

	1989	1990	1991	1992	1993	1994
Intraregional						
Portfolio investment	1.95	3.20	2.20	0.87	11.27	2.00
Mergers and aquisitions	0.16	0.27	1.03	1.32	3.34	3.56
Tangible assets	15.13	11.59	15.07	15.34	36.65	47.97
Japanese						
Portfolio investment	1.86	2.15	2.06	2.05	8.68	6.00
Mergers and acquisitions	0.06	0.44	0.03	0.02	0.15	0.04
Tangible assets	5.24	5.42	4.30	3.10	2.39	3.73
Total intra-Asian flows	**24.40**	**23.07**	**24.69**	**22.70**	**62.48**	**63.30**
Rest of the world						
Portfolio investment	(0.51)	(1.45)	0.54	7.98	20.15	8.00
Mergers and acquisitions	0.18	0.73	0.24	1.59	2.99	8.47
Tangible assets	4.13	1.75	2.63	11.33	5.78	3.33
Total flows	**28.2**	**24.10**	**28.10**	**43.60**	**91.40**	**83.10**
		(As a percent of total capital flows)				
Intra-Asian	86.5	95.7	87.9	52.1	68.4	76.2
Japanese flows	25.4	33.2	22.7	11.9	12.3	11.8
Tangible assets	86.9	77.8	78.3	68.3	49.0	66.2

Source: Baring Securities.

Figure 6. Net Purchases of Foreign Stocks and Investment Trusts by Japanese Investors
Through Securities Companies, 1992-95
(In millions of U.S. dollars)
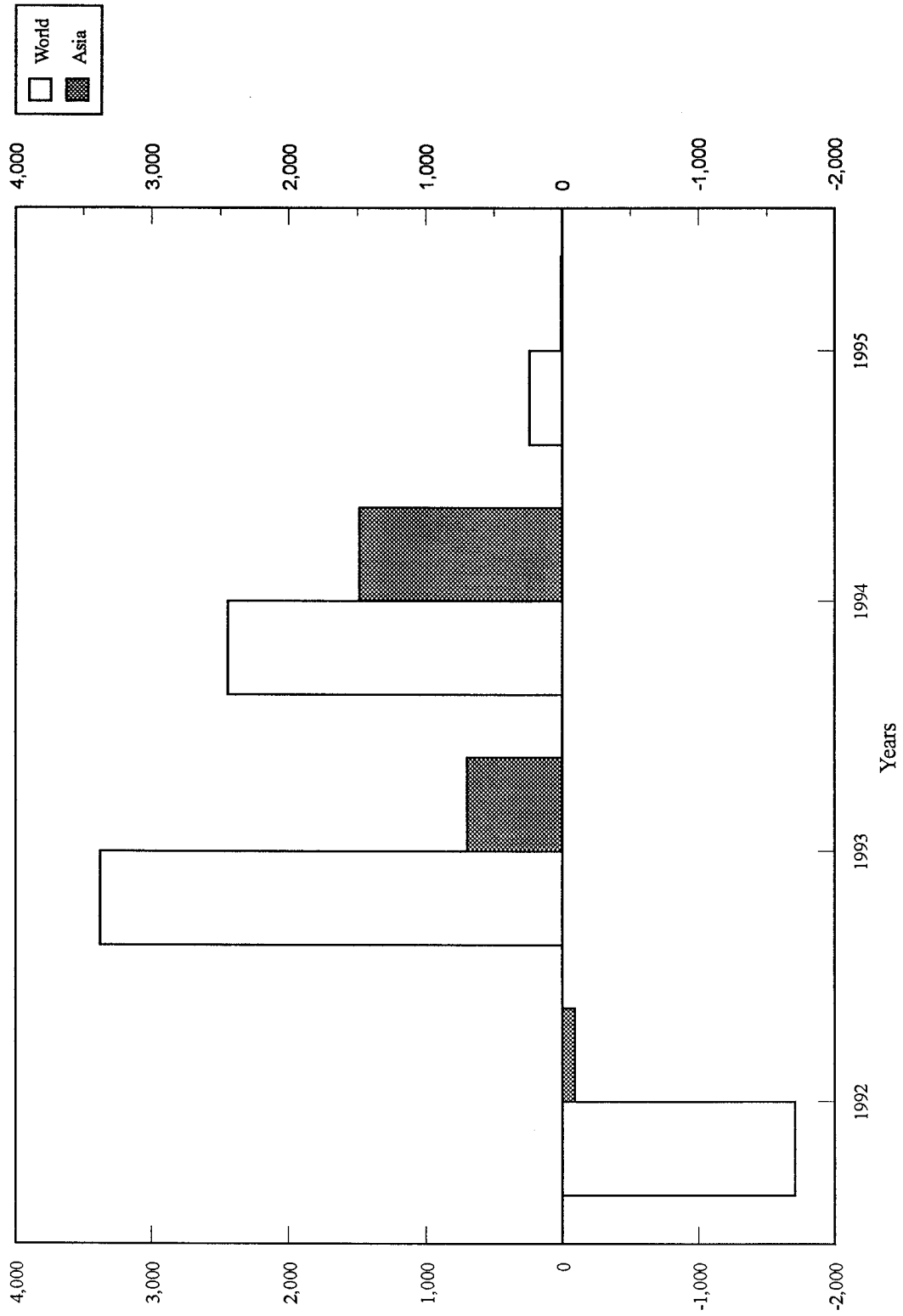
Figure 6. Net Purchase of Foreign Stocks and Investment Trusts by Japanese Investors Through
Securities Companies, 1992-95

Figure 7. United States: Net Portfolio Flows to Defined Regions, 1994
(In millions of U.S. dollars)

Bonds
Stocks

4,000
3,000
2,000
1,000
0
-1,000
-2,000
-3,000
-4,000

Transition Economies

Latin America

Emerging Asia

Asian NIEs
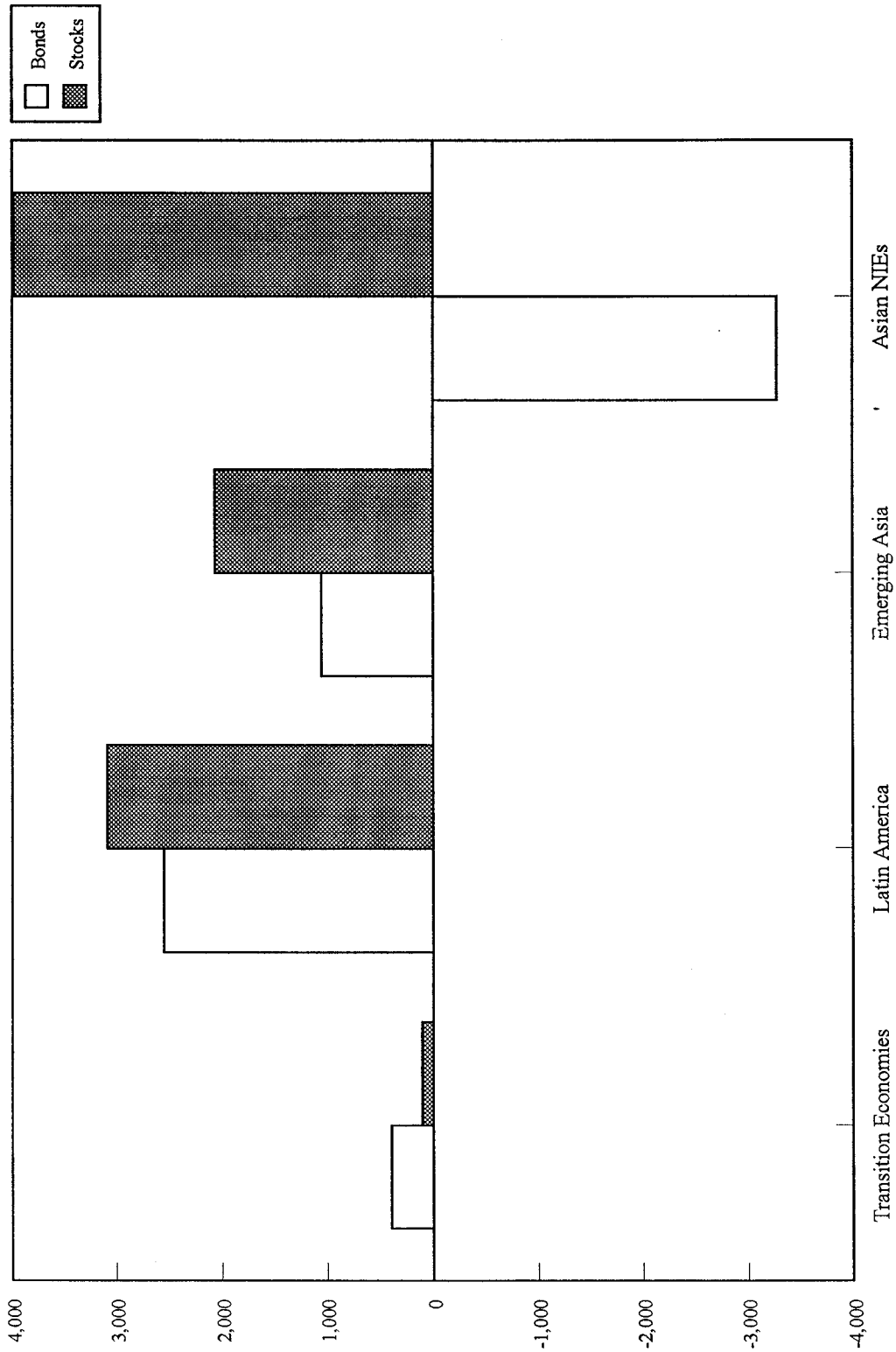
Source: United States, The Department of the Treasury.

Figure 7. United States: Net Portfolio Flows to Defined Regions, 1994

Figure 8. United States: Net Portfolio Flows to Defined Regions, 1995
(In millions of U.S. dollars)
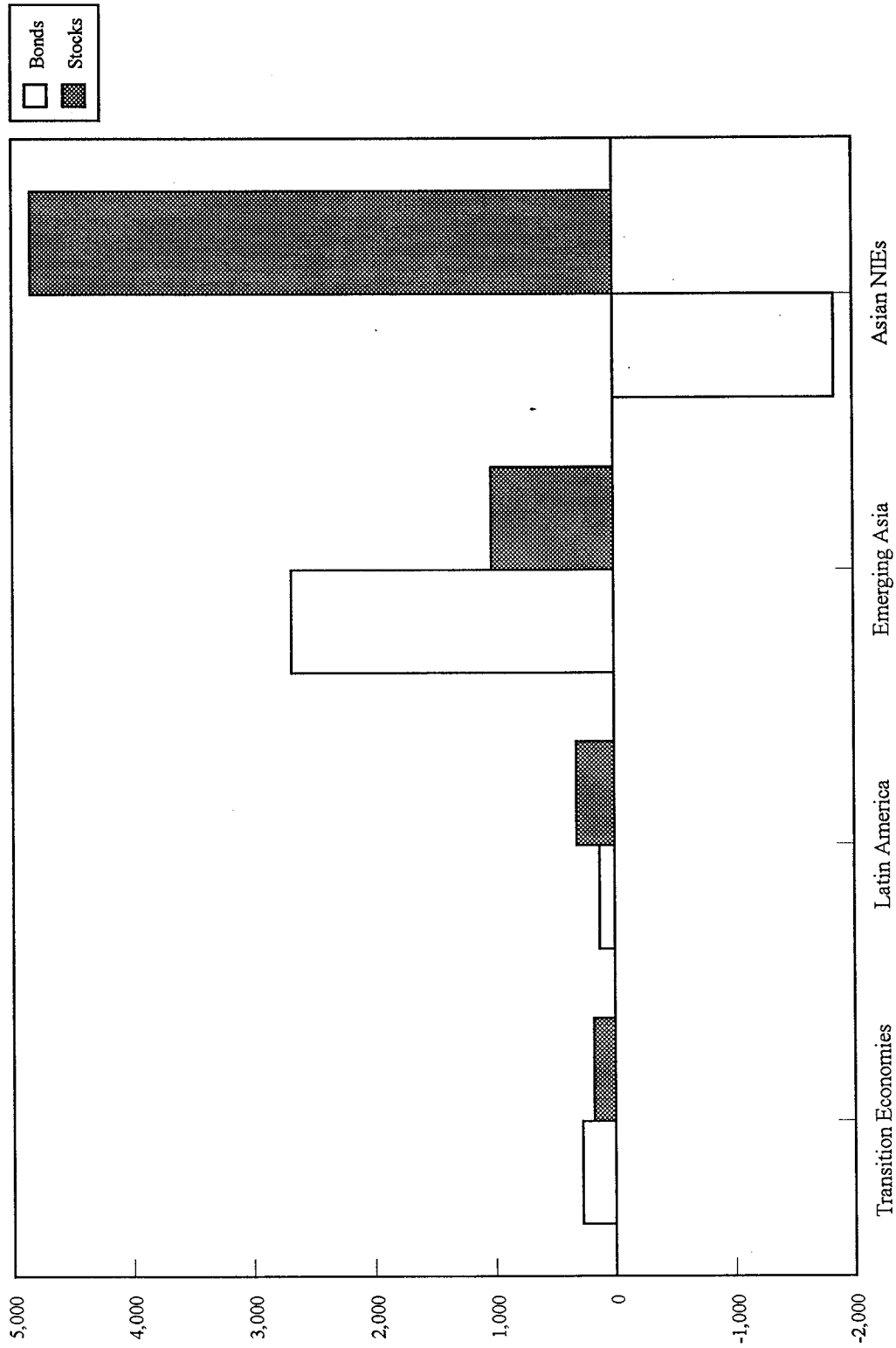
Source: United States, The Department of the Treasury.

Figure 8. United States: Net Portfolio Flows to Defined Regions, 1995

important role as suppliers of capital for Asian emerging markets. Consider, for example, the case of Thailand; Table 3 shows the volume of portfolio capital flows to Thailand by country for 1994 and 1995. For Thailand, Singapore and Hong Kong were the two most important suppliers of portfolio flows. Contrary to the popular perception, Japan only provided a minor amount of capital.

While there are many reasons for the observed intraregional flow patterns, one noticeable feature is that the main regional suppliers in Asia have similar (high) growth rates or investment return potentials as the recipient countries; for example, Singapore and Hong Kong are comparable to Thailand and Malaysia in this regard. However, the capital suppliers have better financial market infrastructures. In Latin America, however, such regional suppliers do not exist. While the United States has a superior financial market infrastructure and abundant capital, it does not have a growth profile similar to that (perceived) in the major Latin American countries.

Using our analytical model described later, we show the theoretical possibility that a country can attract portfolio capital flows from another country with an identical growth potential but with a better developed capital market. A condition for this result is that the investment potentials in both countries be sufficiently high. This theoretical case offers an interesting way to explain the observed pattern of intraregional portfolio equity flows in Asia and the lack of such flows in Latin America.

C. Sensitivity to the World Interest Rate

Figure 9 shows the relationship between the U.S. long-term bond yield (a proxy for the world interest rate) and the net portfolio flow and FDI to developing countries. While a strong negative correlation between the interest rate and the net portfolio flow is easily detectable, FDI is relatively unaffected by changes in the interest rate.

A common explanation for the negative correlation between portfolio flows and the world interest rate is that investors in industrialized countries face a higher opportunity cost of investing abroad when the interest rate is high, and therefore reduce their supply of capital to developing countries. While the argument is correct in general, it fails to explain more detailed patterns of capital flows. For example, changes in the interest rate should also affect the opportunity cost of FDI, but why does FDI not exhibit an obvious negative correlation with the interest rate as in the case of portfolio flows?

Figures 7 and 8 present another puzzling pattern. U.S. net portfolio equity flows to emerging Asian countries declined between 1994 and 1995, while the flow to Asian NIEs increased during the same period. As we know, the U.S. interest rate declined during the period. This suggests that the NIEs may have emerged as competitors for funds as the U.S. interest rate dropped. Our model can provide a hint on how to explain this "competition effect." The explanation hinges on the theoretical result that high growth countries with reasonably developed financial markets can attract capital from developed countries with low growth rates when the world interest rate falls below certain levels.

Table 3. Net Flows of Portfolio Investment to Thailand, Classified by Countries, 1994-95

(In millions of U.S. dollars)

Countries	1994			1995			Percent change in Net Flow
	Inflow	Outflow	Net	Inflow	Outflow	Net	
Singapore	2,671.2	2,751.1	-79.9	3,520.2	2,257.2	1,263.0	1,680.7
Hong Kong	1,226.2	993.6	232.6	1,283.9	914.4	369.5	58.9
United Kingdom	1,525.0	1,960.2	-435.2	1,343.2	1,035.1	308.1	170.8
United States	565.4	377.3	188.1	318.8	280.2	38.6	-79.5
Belgium	15.6	62.2	-46.6	38.8	107.7	-68.9	-47.9
Netherlands	2.9	331.7	-328.8	16.1	183.0	-166.9	49.2
Others	362.9 1/	289.2	73.7	323.5 2/	106.8	216.7	194.0
TOTAL	6,369.2	6,765.3	-396.1	6,844.4	4,884.4	1,960.1	594.8

Source: Bank of Thailand
1/ Mostly comprised of Virgin Islands, Bahamas, Japan, Switzerland, Luxembourg, etc.
2/ Mostly comprised of Australia, Switzerland, Luxembourg, Japan, etc.

Figure 9. United States: Yield on 30-year Treasury Bonds and Net Portfolio Outflows, 1992-95 (QI - QIV)
(Period average yield in percent and outflows in millions of U.S. dollars)
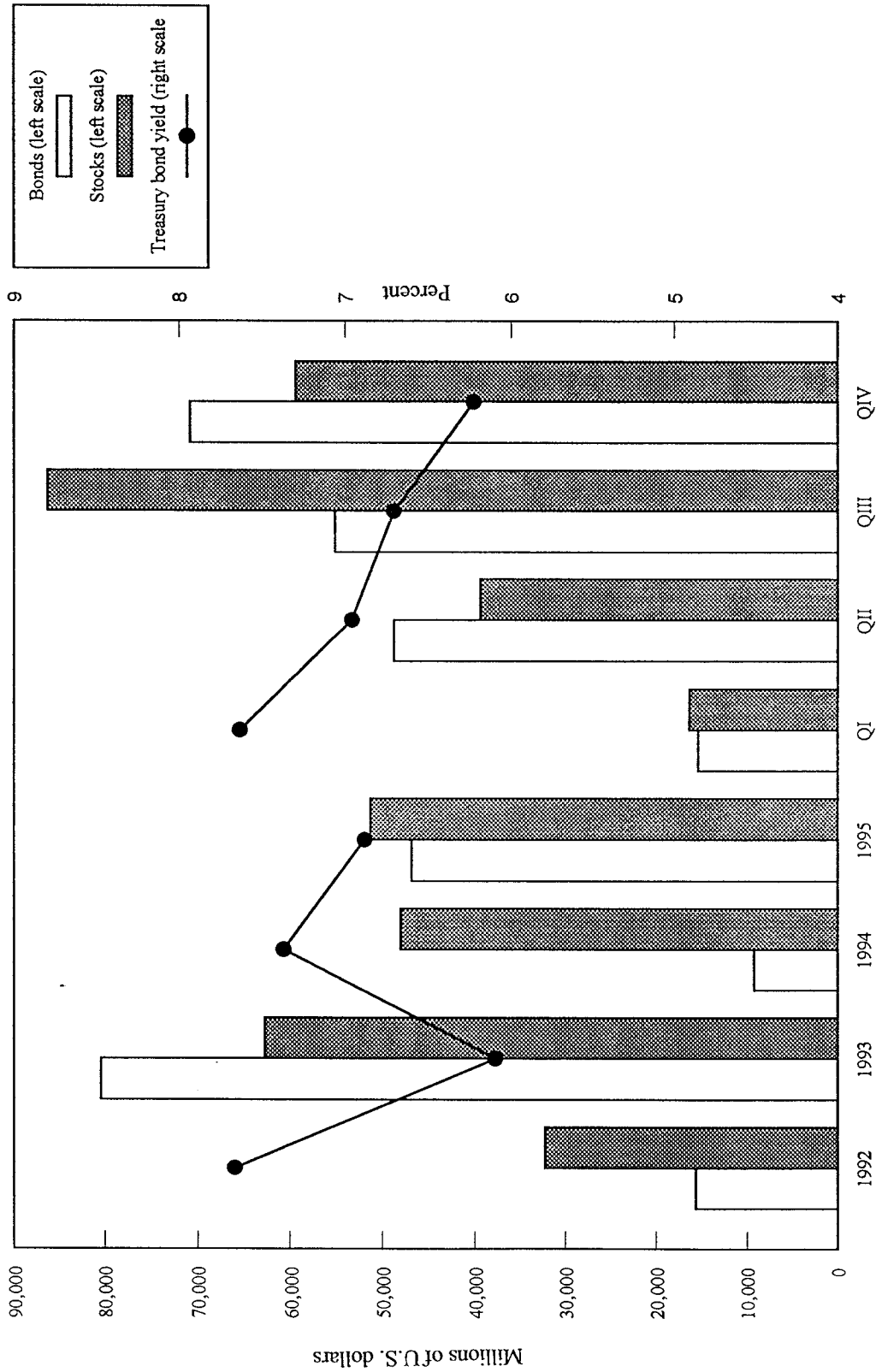
Source: United States, The Department of the Treasury.

Figure 9. United States: Yield on 30-Year Treasury Bonds and Net Portfolio Outflows, 1992-95

D. Where the Money Goes: Attractions and Fatal Attractions

Table 4 gives an overview of the geographical distribution of capital flows to the developing world. It shows clearly that capital tends to flow to regions where potential investment returns are high (typically to high growth countries) and/or where the market mechanism has begun to take root. Among the major attractions to foreign investors in recent years were Asia, the transition economies in Eastern Europe, and Western Hemisphere countries.

However, the foreign investors' affair with Latin American countries turned out to be, at times, "fatal attractions," as vividly illustrated by the Mexican peso crisis of December 1994. While conventional wisdom attributes the crisis to the sudden downward revision of foreign investors' expectations on the Mexican economy and rising doubts about the soundness of Mexico's financial system, many investors and policymakers were caught off-guard, and some are still puzzled, by the speed and magnitude of the reversal in capital flows to the region.

Furthermore, while many countries, especially some Latin American countries, such as Argentina, felt the strong impact of the Mexican crisis, not all countries experienced catastrophic reversals of capital flows. In fact, most Asian countries demonstrated remarkable resilience and experienced a quick rebound of capital flows in the aftermath of the Mexican crisis (Ito and Folkerts-Landau, 1996). Our model allows for sudden reversals of capital flows for certain economies experiencing changes in the perceived growth potential or financial market integrity, or both.

III. EXPLANATIONS

The explanations provided in this paper are based on the implications of a theoretical model of cost of financing. It should be noted that while theoretical models can offer new ways to look at the practical issues, direct assessment of specific countries' experiences would require the establishment of further empirical linkages between the model and the countries in question. In this regard, the explanations discussed here should be viewed as theoretical in nature, even though the issues examined are motivated by actual country experiences. Furthermore, as mentioned earlier, our basic model concentrates only on the *financial* aspect of capital flows.

The basic building blocks of our model are the theories of *investment trap* and *emerging market premium* of Chen and Huang (1995, 1996). For simplicity, we consider a representative firm with an ongoing investment project and a new investment opportunity. Given that the market is inefficient, we derive the expected return to foreign investment on the new investment project. To quantify the degree of market inefficiency, it is necessary to make strict assumptions without loss of generality. Here we assume a specific form of inefficiency resulting from information an asymmetry between corporate insiders and outsiders in the financial market. As we have argued earlier, such information asymmetry is typical in developing countries or emerging markets where the financial market is not well developed. The insiders of the firm, i.e., the ex-

Table 4. Capital Flows to Developing Countries, 1990-95

(In billions of U.S. dollars)

	1990	1991	1992	1993	1994	1995
All developing countries						
Total net capital inflows 1/	35.5	154.4	130.1	172.9	151.6	193.7
Foreign direct investment plus						
portfolio investment (net)	36.9	65.3	78.8	138.5	111.7	108.6
Net foreign direct investment	18.6	28.4	31.6	48.9	61.3	71.7
Net portfolio investment	18.3	36.9	47.2	89.6	50.4	37.0
Other 2/	-1.4	89.1	51.3	34.5	39.8	85.1
Of which:						
Net credit and loans from IMF	-1.9	1.1	-0.2	-0.1	-0.8	12.2
Africa						
Total net capital inflows 1/	2.0	3.5	2.7	7.2	13.4	12.6
Foreign direct investment plus						
portfolio investment (net)	1.1	1.1	1.6	0.3	3.3	2.2
Net foreign direct investment	1.4	1.6	2.6	1.2	2.2	2.1
Net portfolio investment	-0.2	-0.5	-1.0	-0.9	1.1	0.1
Other 2/	0.8	2.4	1.1	6.9	10.1	10.4
Of which:						
Net credit and loans from IMF	-0.6	0.2	-0.2	0.2	0.9	0.8
Asia						
Total net capital inflows 1/	23.1	49.8	32.1	70.5	81.1	104.1
Foreign direct investment plus						
portfolio investment (net)	8.5	17.2	24.2	56.5	57.9	70.9
Net foreign direct investment	9.4	14.3	14.4	32.7	41.9	52.4
Net portfolio investment	-0.9	2.9	9.8	23.8	16.0	18.5
Other 2/	14.6	32.6	7.9	14.0	23.1	33.2
Of which:						
Net credit and loans from IMF	-2.4	1.9	1.3	0.6	-0.8	-1.8
Middle East						
Total net capital inflows 1/	-8.1	78.1	42.2	31.9	9.9	15.1
Foreign direct investment plus						
portfolio investment (net)	3.3	24.5	22.4	16.3	15.4	8.4
Net foreign direct investment	1.2	1.3	1.8	1.1	-0.5	0.0
Net portfolio investment	2.1	23.2	20.6	15.1	15.9	8.4
Other 2/	-11.4	53.6	19.9	15.6	-5.5	6.7
Of which:						
Net credit and loans from IMF	-0.1	0.0	0.4	-0.0	0.4	0.3
Latin America						
Total net capital inflows 1/	18.5	23.0	53.1	63.4	47.2	61.8
Foreign direct investment plus						
portfolio investment (net)	24.0	22.5	30.7	65.5	35.1	27.2
Net foreign direct investment	6.6	11.2	12.8	13.9	17.7	17.1
Net portfolio investment	17.4	11.4	17.8	51.6	17.4	10.0
Other 2/	-5.5	0.5	22.5	-2.1	12.1	34.7
Of which:						
Net credit and loans from IMF	1.2	-1.0	-1.6	-0.9	-1.3	12.9
Memorandum items:						
All developing countries						
Total net capital inflows 1/	11.9	-0.5	5.0	10.9	13.6	34.4
Foreign direct investment plus						
portfolio investment (net)	0.0	3.2	3.3	8.8	8.5	17.3
Net foreign direct investment	0.0	2.4	4.2	6.0	5.6	11.4
Net portfolio investment	—	0.8	-0.8	2.7	3.0	6.0
Other 2/	11.9	-3.7	1.7	2.1	5.1	17.1
Of which:						
Net credit and loans from IMF	0.3	2.4	1.6	3.7	2.4	4.7

Source: International Monetary Fund, World Economic Outlook Data Base.

1/ Not including reserve assets.
2/ Short- and long-term credits; loan (including use of Fund credit); currency and deposits;
and other account receivable and payable.

isting shareholders or the management, know the true value of the firm and the value of any new project the firm can undertake. However, the outsiders, i.e., potential new shareholders relying on the information provided by the financial market, may not know the true value of the firm and of its new projects. If the firm's shares are overpriced in the financial market, then the insiders will have an incentive to issue new shares to finance certain new projects, even though the projects are known by the insiders to yield negative returns. Similarly, if the firm's shares are undervalued in the market, then the insiders will drop certain new investment projects, even though the returns of these projects are known by the insiders to be positive.

While these inefficient investment problems have been well known since the original work of Myers and Majluf (1984), it was only recently that researchers began to look at ways to resolve the problem using optimal contracts between the managers and the existing shareholders (Dybvig and Zender, 1991). Such contracts usually index the manager's compensation to the changes in market prices of the firm's shares, so that the manager will automatically make the efficient investment decisions. Chen and Huang (1995) find that such optimal contracts work only to a certain extent. As long as there is asymmetric information between the firm's insiders and the financial market, there will be an "investment trap" in which over-investment and under-investment occur. Furthermore, the size of the trap is proportional to the degree of asymmetric information. One way to measure the degree of asymmetric information is to take the absolute value of the actual deviation of the market valuation from the true value of the firm, divided by the market price. Another way to measure it is the expected value of such deviation (similar to a standard deviation). In principle, the less developed is the market infrastructure, e.g., the greater the problems with accounting standards, and information disclosure and transmission, the larger the investment trap.

Figure 10 provides a visual presentation of the investment trap. The two shaded intervals (investment trap) are where inefficient investment decisions are made. In the interval $(\underline{r}^*, 0)$, the returns on investment are negative but the projects are still taken by the firm. In the interval $(0, \bar{r}^*)$, the investment projects have positive returns but are not pursued by the firm. The upper and lower limits of the investment trap—$\underline{r}^*$ and $\bar{r}^*$—are related to the degree of asymmetric information.

Chen and Huang (1995) give exact formulas for the upper and lower limits of the investment trap. For our purpose, we can assume that $\underline{r}^* = -\bar{r}^*$ holds approximately, as they differ by a fixed incentive parameter which, theoretically, can be arbitrarily small.[7] For convenience, we use the symbol $r^*(= \underline{r}^*)$ as a measure of the degree of market inefficiency.[8]

Consider the investment problem from the foreign portfolio equity investor's standpoint. Assume for now that the foreign investment is small relative to the host country's equity market, so that any investment action does not affect the market price. Consider two simple economies, A

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[7]See Chen and Huang (1995) for details.

[8]This is, in fact, a half the size of the investment trap.
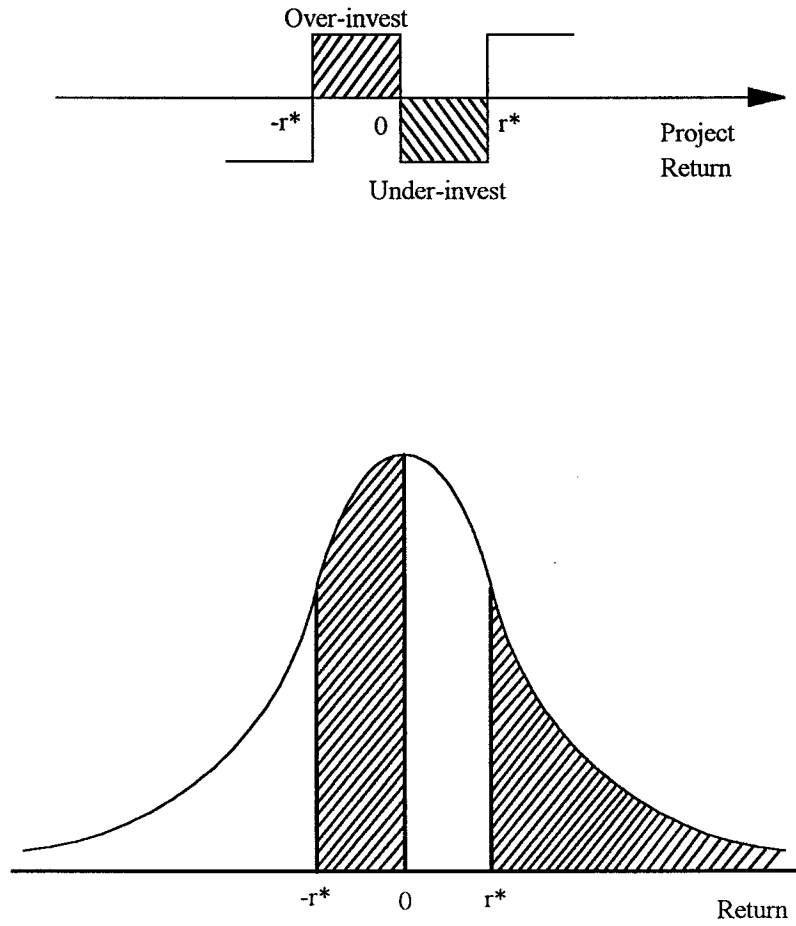
Figure 10. Investment Trap and Return Distribution

Figure 10. Investment Trap and Return Distribution

and B, with identical distributions of investment opportunities—the returns on new investment projects in each country can be defined as i.i.d. $N(\mu, \sigma^2)$.[9] Here, μ is the mean return when all investment projects are pursued indiscriminately. Of course, indiscriminate investment is unlikely in reality if the market and corporate governance are at work. For example, in the ideal case of efficient capital market and optimal corporate governance, projects with negative returns are not pursued by the firms. Nevertheless, the notion μ is useful as it represents the average natural rate of return to investments in the economy. Since returns in an economy are related to the future growth, as a conceptual matter, we shall interpret μ as the economy's *growth potential.*

Now take Economy A as the reference economy, with a perfect financial market and an optimal market-indexed corporate governance mechanism, so that perfect investment decisions can be made (i.e., the trap size $r_A^* = 0$). In this economy, all projects with negative returns are dropped, and all positive return projects are undertaken. So, the expected return conditional on perfect financial market and corporate governance is

$$E[r|r_A^*] = \frac{\phi(-\frac{\mu}{\sigma})}{1 - \Phi(-\frac{\mu}{\sigma})}, \tag{1}$$

where $\phi(\cdot)$ and $\Phi(\cdot)$ are, respectively, the probability density function and the cumulative density function of the standard normal distribution. The calculation above involves the moments of truncated distributions.[10] For simplicity the country subscript has been omitted on the right-hand side of the equation. When μ is high, the model economy resembles a high growth economy with a developed financial market, such as some emerging markets. When μ is set to a low level (say, a normalized level of zero), the model economy captures the feature of the low growth, developed economies, to which we shall refer as the "west."

Next, assume that Economy B has an investment trap of size $r_B^*(> 0)$. The expected return is therefore defined over the two shaded areas in Figure 10. Algebraically, this is represented by:

$$E[r|r_B^*] = \frac{\phi(\frac{r^*-\mu}{\sigma}) + \phi(\frac{-r^*-\mu}{\sigma}) - \phi(-\frac{\mu}{\sigma})}{1 + \Phi(-\frac{\mu}{\sigma}) - \Phi(\frac{r^*-\mu}{\sigma}) - \Phi(\frac{-r^*-\mu}{\sigma})}. \tag{2}$$

As a typical emerging market is, by definition, less efficient than the financial market in a developed economy, Economy B in our analysis can be defined as an emerging market economy. Chen and Huang (1996) define the *emerging market premium (discount)* as the difference

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[9]Of course, the single distribution case is only for illustrative purposes. An economy may have different types of investment projects with different mean returns and variances, typically associated with different industries. This possibility can be discussed in our framework by focusing on capital flows to specific classes of investment projects. The normal distribution is used as a reasonable approximation of the actual distribution of investment opportunities.

[10]See Maddala (1983) for the technical details.

between the expected returns in the two economies, i.e., $E[r|r_B^*] - E[r|r_A^*]$.

Now, consider the case where the two economies have the same growth potential, μ, then:

$$E[r|r_B^*] - E[r|r_A^*] = \frac{\phi(\frac{r^*-\mu}{\sigma}) + \phi(\frac{-r^*-\mu}{\sigma}) - \phi(-\frac{\mu}{\sigma})}{1 + \Phi(-\frac{\mu}{\sigma}) - \Phi(\frac{r^*-\mu}{\sigma}) - \Phi(\frac{-r^*-\mu}{\sigma})} - \frac{\phi(-\frac{\mu}{\sigma})}{1 - \Phi(-\frac{\mu}{\sigma})}. \quad (3)$$

Note that, for simplicity, country subscripts have been omitted on the right-hand side of the above equations. Equation (3) above depicts the excess (or shortfall) of the expected return in the emerging market economy as compared to the expected return in an otherwise identical economy with a developed capital market. When the return differential on the left-hand side of the above equation is negative, portfolio equity investors from Economy A will buy into Economy B only at a discount. When the return differential is positive, however, the same investors from Economy A are willing to pay a premium to invest in Economy B.

Because of the nonlinearity of the probability distribution functions, the relationship between the premium and the size of the investment trap is not monotone in general, and is also affected by other parameters such as μ and σ. Figure 11 shows a numerical example of the ups and downs of investment returns in emerging markets. The vertical axis is the emerging market premium (or discount, when negative), calculated using equation (3) for the following parameter ranges: $0 \le r^* \le 1$, $0 \le \mu \le 3.5$, and $\sigma = 1$. As we can see, there is a discount for countries with a large r^* (i.e., a highly inefficient financial market) and a small μ (i.e., a low growth potential). However, as we can expect from the nonlinear function, there is a twist in the relationship as the two parameters increase to certain levels—there the excess return becomes positive. In other words, foreign investors (from Economy A) will *pay* a premium for investing in the emerging market. When the two parameters further increase, however, the premium (discount) diminishes, as can be seen from the flat surface towards the rear of the graph. This is because the main portion of the density mass of the investment opportunity distribution either falls into the large trap (when r^* is very large) or is excluded from the investment trap (when $\mu \gg r^*$). In the former case, the expected return in the emerging market is small as in the case of perfect market with a large μ. In the latter case, the effect of the trap is small so the difference between the expected returns in the two markets is small.

From the above exercise we can infer the following propositions:

Proposition 1 (Intraregional flows.) *With high enough growth potential, countries with less developed equity markets may be able to attract foreign portfolio equity investments from countries with similarly high investment potentials but more efficient financial markets. However, when the growth potential is too low, such intraregional flows will not occur.*

This proposition provides a theoretical case for the so called intraregional flows discussed in Section II.B. Figure 12 plots, for extended parameter ranges, the excess returns in the emerging market economy over a reference economy (Economy A) with zero potential return and a perfect financial market, i.e., $\mu_A = 0$, $r_A^* = 0$. This reference economy can be viewed as a proxy for

Figure 11. Emerging Market Premium over the Economy with Identical Growth Potential and an Efficient Financial Market
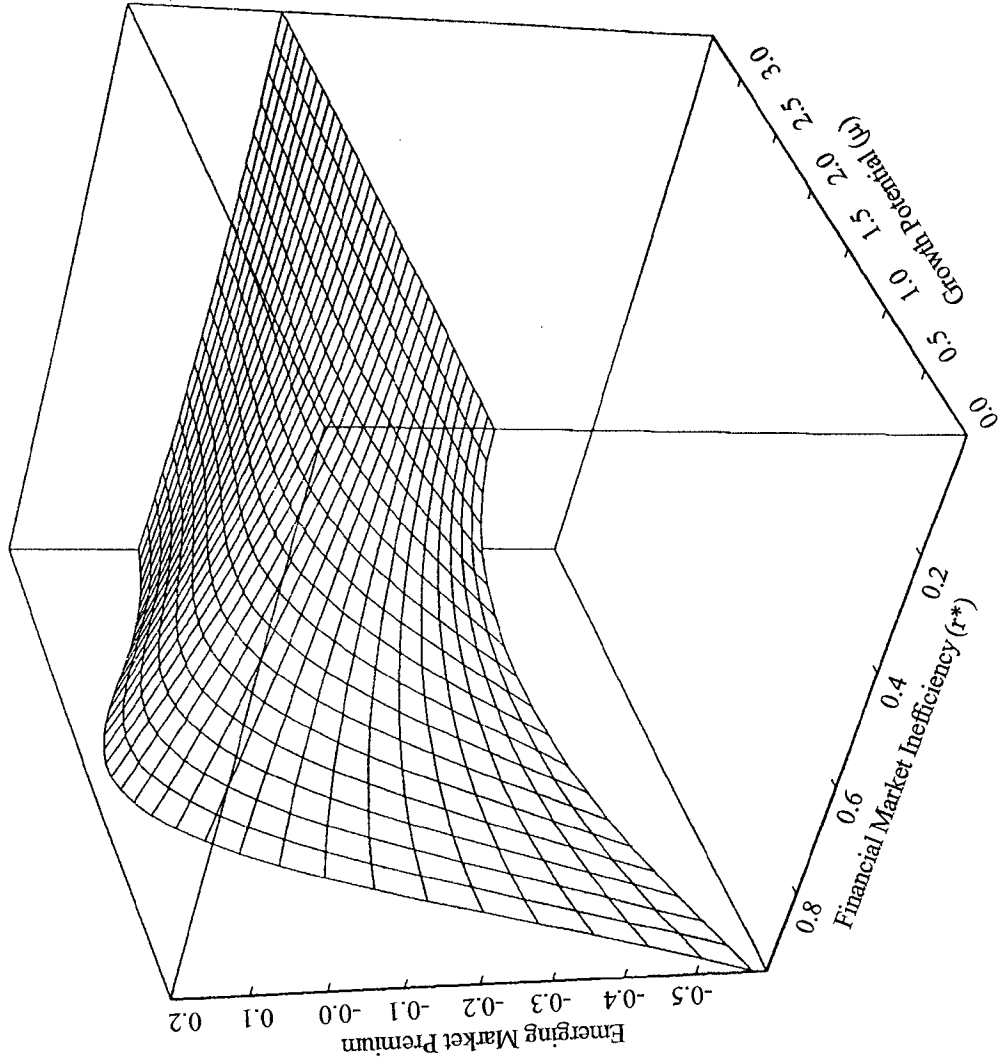
Figure 11. Emerging Market Premium over the Economy with Identical Growth Potential and an Efficient Financial Market

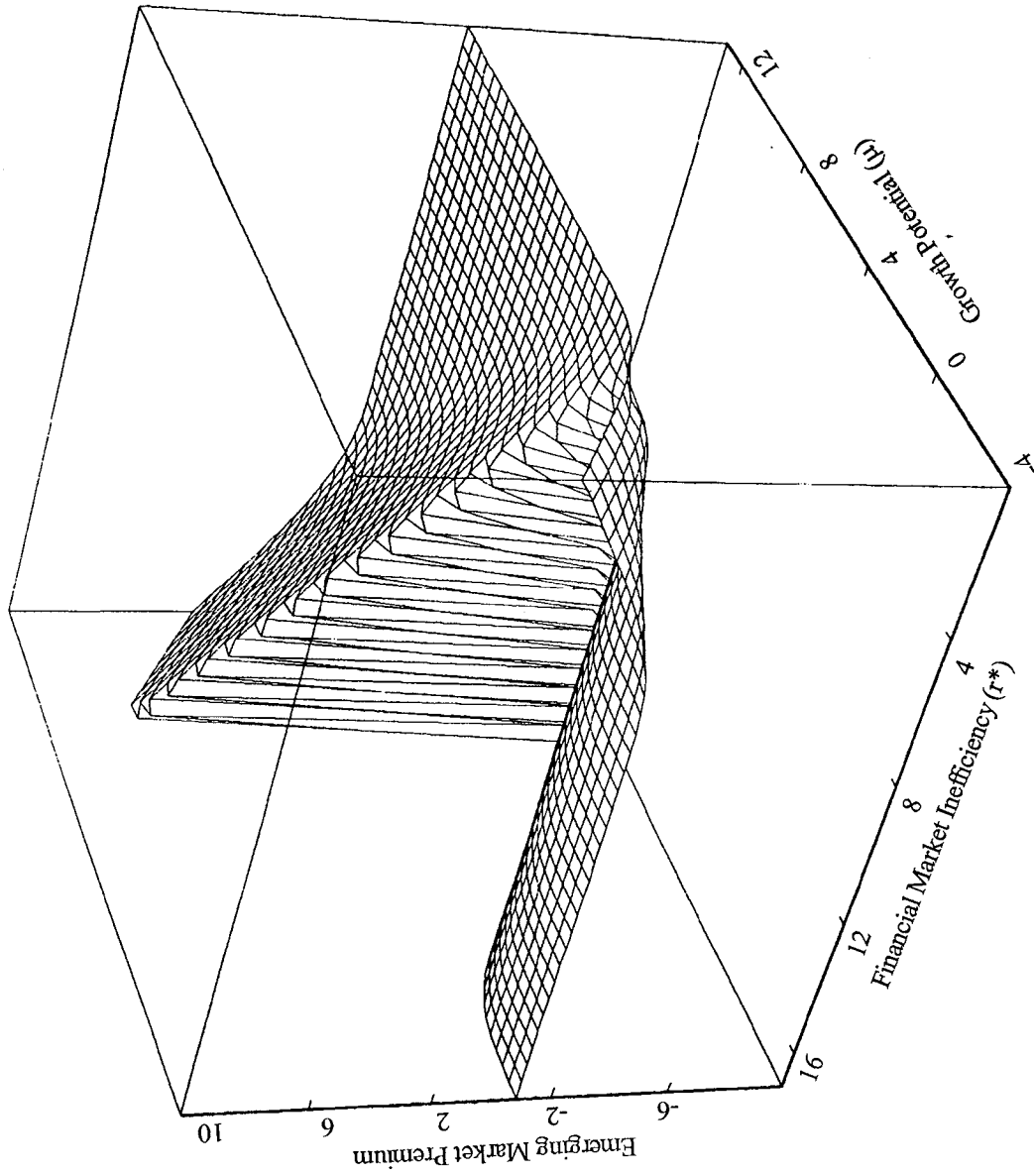Figure 12. Emerging Market Premium over the "Western" Economy

Figure 12. Emerging Market Premium over the "Western" Economy

a typical low-growth "western" economy with a highly-developed financial market. The figure therefore captures the attractiveness of different economies from the viewpoint of the investors of a typical "western" country. Only those economies with positive return premia can attract western investment. Graphically, these economies are the ones situated in the "high ground" area towards the left, rear part of Figure 12. These economies exhibit special configurations of market efficiency and investment potential: both parameters tend to be high, with the growth effect outweighing the effect of inefficiencies in the financial market. Therefore,

Proposition 2 (Distribution of capital flows) *The economies that are able to attract portfolio equity flows from "western" countries exhibit a suitable configuration of the growth potential and the financial market inefficiency. Both parameters should be high enough, with the positive effect of growth outweighing the effect of the inefficient financial market. Further, the attractiveness of these economies to "western" equity portfolio investors tends to diminish if the dominance of the growth parameter becomes too extreme.*

So far we have not considered the effect of the world interest rate.[11] If this interest rate is used for the "west" as the reference return, we can imagine it acting as a horizontal hyperplane in Figure 12. Only the economies above the plane are able to attract portfolio equity flows from the "west," and again they tend to be the ones described in the above proposition. However, a lowering of the interest rate plane will help more economies emerge above the plane, and such economies tend to be the ones with high growth potentials and relatively developed financial markets (e.g., the Asian NIEs), and the ones with bad financial markets but very high growth potentials. The increasing number of economies eligible for "western" funds leads to the competition for funds, as discussed in Section II.C. On the supply side, the number of economies exporting capital (the right, front corner) will also increase as the interest rate falls. Hence, the following proposition:

Proposition 3 (Competition effect of low interest rate) *An interest rate cut in the "west" increases the supply of capital to the rest of the world, and leads to more developing economies competing for funds from the "west." The newly-emerging competitors include countries with high growth potentials and relatively efficient financial markets, and countries with very high growth potentials and relatively inefficient financial markets.*

This proposition differs from the general statement about the role of the interest rate in the literature. It applies only to the selected economies from both the demand side and the supply side. In particular, it sheds light on the diversion of capital to such economies as the Asian NIEs following cuts in the world interest rate.

We now discuss the possibility of sudden reversals of capital flows as discussed in Section II.D. From Figure 12, we can see a deep "valley" in which economies have extreme difficulties attracting foreign portfolio investment due to high financing costs. Economies at the bottom

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[11] The interest rate is normalized to zero in the original model of Chen and Huang (1995).

of the "valley" typically have their growth potentials (even large ones) dominated by financial market inefficiencies. These economies are unable to attract equity portfolio flows due to the high costs of financing. Economies on the upper hills of the "valley," however, can attract large capital flows at times. Being situated on a steep slope, however, they are especially vulnerable to changes in their growth potential and their financial market integrity as perceived by foreign investors—a small change in either can throw these economies into the "valley." This leads to the following proposition:

Proposition 4 (Fatal attraction) *A catastrophic change in financing costs, and therefore a sudden capital flow reversal, may occur for certain economies experiencing (perceived) changes in their return potentials and/or financial market integrity. Such economies tend to be the ones with a moderate growth/market efficiency configuration where the two parameters are not extreme relative to each other.*

Practically speaking, economies that are prone to "fatal attractions" are those that have a mediocre growth potential and a semi-developed financial market. Note also that while a slight change in the market perception about the economy and its financial market may lead to catastrophic changes, changes in the interest rate only lead to moderate changes in a country's financing cost. This helps distinguish "fatal attractions" from the real attractions.

So far, we have focused only on a specific form of capital flows—the portfolio equity flow. Bonds and bank lending can be discussed in a similar manner, as there also exists inefficiencies such as the insider-outsider information asymmetry in debt financing. The inefficiencies can be attributed to an underdeveloped bond market or a weak banking sector. A modification will have to be made, however, to capture the default risk. The exact formulas for foreign debt investment premiums can be different, but the qualitative results should remain the same. Inefficiencies in the domestic debt market and banking sector may lead to inefficient investment decisions by the borrowing firms, raising the cost of financing in international borrowing. In view of the large body of literature on debt contracts, we do not pursue the analysis further in this paper. Instead, we focus our discussions on the interactions between different forms of capital flows.

Depending on the degree and nature of the various forms of financing, the cost of financing the different forms of capital flows may be different. As discussed in Razin, Sadka and Yuen (1995), direct managerial involvement by "green field" FDI partners can circumvent the financial market inefficiencies, and therefore may offer a cheaper alternative to portfolio financing. Of course, "green field" FDI also entails its own costs, such as cultural barriers and project specificity requirements. To the extent that such costs are smaller than the cost of portfolio financing, FDI can be the preferred form of capital flow. In light of our analysis above, FDI can be an especially useful substitute to portfolio equity flows when the cost of the latter is high. From Figure 12, we know that this is the case for countries that exhibit both high growth potential and a high level of financial market inefficiency, but with growth not high enough to compensate the negative effect of the inefficient financial market (i.e., the countries inside the "valley.").

Proposition 5 (Composition of capital flows) *The choice of the preferred form of capital flow,*

other things equal, depends on the relative financing costs of different forms of capital flow. When the premium on portfolio equity flow is high, portfolio equity flow may be the dominant form of capital flow. When the premium is strongly negative, as in the case of relatively high growth but extremely inefficient equity market, other forms of capital flows, such as FDI and debt, may be preferred.

A word about official flows is in order. As we can see, a country's growth potential and its financial market structure play an important role in attracting private capital flows. But, for countries with virtually no growth potential and no financial market, official grants and assistance become the default option. Furthermore, as long as the country has some growth potential and some financial market structure, official flows can be very useful in better allocating the private resources.

Different forms of capital flows may also present positive externalities to each other. Debt, for example, has been long recognized to provide an extra control on corporate governance, while FDI can increase the country's external collateral value, and help the transmission of information to foreign investors, thereby reducing the financing costs of debt and portfolio equity flows.

So far we have assumed that the foreign investor is small relative to the domestic market, so that his action does not affect the domestic asset prices. If foreign investors act as a large player, as in the case of U.S. mutual funds in many emerging markets, then the liquidity of the domestic market also comes into play. When large foreign investors act together in a concerted way, they may not invest much in an illiquid market to begin with, because a large inflow of foreign capital into an illiquid market may exacerbate the investment trap effect by creating further deviations of the market prices from the underlying values of the firms, and therefore encourage inefficient investment, which may reduce the expected returns to foreign investments. For example, the Chinese B-share market, designed for foreign currency investors only, has not been successful in attracting foreign equity investors, as they are concerned with the lack of liquidity and reliable information. In the case that foreign investors act sequentially, they may create a short-run spiral of the equity price in the market, as each investor's action creates a further deviation of the market price from the true value of the underlying firm.

IV. CONCLUDING REMARKS

There are many factors affecting international capital flows, and understanding each aspect of these effects can help to better explain the observed patterns of capital flows. In this paper, we have focused on the cost of financing aspect of capital flows. We have shown how the level of financial market development in the host country can affect the amount as well as the composition of capital inflows. More interestingly, we have demonstrated that a rich variety of capital flow patterns can be generated by the interaction of the degree of financial market development in the recipient country and the country's growth potential. Further, we have shown how to conduct a comparative static analysis for different levels of world interest rate. The model opens a door

to broader macroeconomic analyses, as the effects of various macroeconomic factors such as fiscal and monetary variables can be channeled through either the growth or the financial market parameters in our model.

The analysis in this paper has a number of policy implications. While the absolute levels of growth potential and financial market development are relevant to capital flows, the relative magnitude of the two is also important. For example, contrary to popular belief, better financial market infrastructure does not always help attract foreign portfolio flows. So, structural reforms should aim at the *appropriate* level of financial development that is consistent with the country's growth potential. Sometimes, a country can take advantage of its high growth potential and relatively underdeveloped financial market to attract portfolio capital easily. However, if the financial market is extremely inefficient relative to its growth potential, then the cost of attracting portfolio capital can be prohibitively high. In the latter case, it pays for the country to improve its financial market. However, such improvement should be fast and reasonably complete in order to avoid the dangerous middle stage where the growth and market parameters are moderate relative to each other—economies in such a middle stage are vulnerable to significant volatility of capital flows. The short-term policy priority for countries in such a stage should be to ensure macroeconomic stability and the integrity of the financial market and of the banking sector, as a slight change in market perception of the two indicators can trigger a reversal of capital flows. It is worth mentioning that while the Mexican crisis sent a timely warning on the possibility of catastrophic reversals of capital flows to developing countries, not all countries are vulnerable to such crises, as demonstrated by the resilience of many East Asian countries in the aftermath of the crisis of December 1994.

In policy discussions, it is commonly maintained that FDI is a better form of financing than portfolio flows. Controlling for the nonfinancial externalities of the two kinds of flows, our analysis shows that the difference between the two mainly lies in the financing costs. The policy implication can then be very different. For example, for a fast-growing country that experiences a high level of FDI but a very small amount of portfolio flows, conventional judgment tends to say that the "quality" of the capital flow is "good." From our cost of financing perspective, however, it may indicate that, other things being equal, the country's financial market is too backward for the country to reap the full benefit of its high growth potential: due to the high cost of portfolio financing, the country cannot attract portfolio flows and instead has to rely on FDI as a substitute. Similar arguments can be extended to bank financing, which dominates the allocation of financial resources in many developing countries.

In conclusion, there is as yet no widely-accepted explanation as to why the volume and composition of capital flows differs among the various emerging market countries. The model proposed in this paper is an attempt to provide a simple unifying framework within which such a question can be examined. But it is obviously not the last word, and there are many areas in which it could be explained. These extensions, while not easy, are necessary if we are to have a better understanding of how developing countries can attract the preferred size and kind of capital flows from abroad.

REFERENCES

Chen, Z. and H. Huang (1996): "Emerging Market Premium." Unpublished manuscript, International Monetary Fund.

————, (1995): "Investment Trap." Financial Markets Group Working Paper No. 227, London School of Economics, London.

Claessens, S., M.P. Dooley and A. Warner (1995): "Portfolio Capital Flows: Hot or Cold?" *The World Bank Economic Review* Vol 9, No. 1. 153-174.

Dybvig, P.H. and J.F. Zender (1991): "Capital Structure and Dividend Irrelevance with Asymmetric Information." *Review of Economic Studies* 4, 201-219.

Ito, T. and D. Folkerts-Landau (1996): *International Capital Markets: Developments, Prospects, and Key Policy Issues.* Washington DC: International Monetary Fund.

Khan, M.S. and D. Mathieson (1996): "The Implications of International Capital Flows for Macroeconomic and Financial Policies." *International Journal of Finance and Economics* 1, 155-160.

————, and C. Reinhart (eds.) (1995): *Capital Flows in the APEC Region.* Occasional Paper 122, International Monetary Fund, Washington DC.

Maddala, G.S. (1983): *Limited Dependent and Qualitative Variables in Econometrics,* Cambridge, UK: Cambridge University Press.

Modigliani, F. and M.H. Miller (1958): "The Cost of Capital, Corporate Finance and the Theory of Investment." *American Economic Review* 48, 261-297.

Myers, S.C., and N.S. Majluf (1984): "Corporate Finance and Investment Decisions When Firms Have Information That Investors Do Not Have." *Journal of Financial Economics* 13, 187-221.

Razin, A., E. Sadka and C.-W. Yuen (1995): "A Pecking Order Theory of Capital Inflows and International Tax Principles." IMF Working Paper WP/96/26. International Monterey Fund, Washington DC.

Turner, P. (1991): "Capital Flows in the 1980s: A Survey of Major Trends." BIS Economic Papers No. 30. Bank for International Settlements, Basel.