FOREIGN CAPITAL FLOWS TO EMERGING MARKETS: A TEST OF POLICY ARBITRAGE

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ABSTRACT

Private capital that dominated the foreign capital inflows to emerging markets in the 1990s has been linked to recent financial crises in these markets. This linkage has raised questions about the market's ability to discipline the flow of capital to emerging markets and the role of policy arbitrage. Policy-arbitrage hypothesis states that international capital flows will arbitrage across national economic policies in search of sound markets. This paper examines the pattern of changes in the foreign capital inflows to emerging markets in the 1990s and tests the policy-arbitrage hypothesis using 22 country-data for a period immediately following the Mexican peso crisis. The test results support the policy-arbitrage hypothesis.

Keywords: foreign capital flow, financial crisis, market efficiency, policy arbitrage

INTRODUCTION

Foreign capital flows to emerging markets in the 1990s saw a major shift towards private sources, indicating a departure from their traditional dependence on official sources. The shift is attributed primarily to rapid economic growth in these markets that was made possible by their liberalization and macroeconomic stabilization programs. Poor investment opportunities in Europe and low interest rates in the U.S. also helped to direct the private capital to these markets. According to the World Bank's 1998 Global Development Finance report, the private net capital flows to developing economies increased by a whopping 610 percent between 1990 and 1997, while the flow from the official sources declined by about 22 percent during the same period.

Foreign capital has always played a key role in transforming traditional economies to modern market economies. The importance of foreign capital to the newly

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emerging countries that are trying to modernize their economies needs no emphasis. There are, however, certain dangers of unrestrained capital inflows that the recipient country can hardly afford to ignore. The changing composition of these inflows, from official to private and from long-term to short-term as has been witnessed in recent years, simply added to these dangers. Short-term private capital tends to be very fickle. It can flee as fast as it arrives at the slightest sign of any economic uncertainty. There have been frequent manifestations of these dangers, often resulting in serious financial crises since the Mexican crisis in 1994.

When a country receives more capital than it can effectively absorb, capital inflows can create difficulties for economic policy management such as inflation control, exchange rate stability, and export competitiveness. These difficulties have proven to be particularly troublesome to the newly emerging economies that have pursued an exchange-rate-based stabilization program in which the exchange rate is pegged and domestic policies concentrate on inflation control and economic stabilization. The pegged currency arrangement encourages excessive foreign borrowing and risky investment, much of which tends to be absorbed by the financial sector in short-term and speculative investments. The resulting misallocation of resources and eventual build-up of non-performing loan portfolios in the banking sector threaten the very sustainability of the peg by rendering the country vulnerable to speculative attack and financial crisis. If the situation is not handled with an appropriate set of policies and prudent supervision of the financial sector at every phase of the stabilization program, the outcome can easily be the type of crisis that occurred in Mexico in 1994 and in many Asian countries during the 1997-98 period.

Investigations by academic researchers and international organizations of the Mexican peso crisis of December 1994 and its contagion to other Latin-American countries in early 1995 have led to the identification of several developments that could make an emerging market vulnerable to financial crisis (Sachs, Tornell, and Velasco 1996, World Bank 1998, Aliber 2000). These developments, which include appreciating real exchange rate, weakening banking sector, and deteriorating current account balance, may trigger capital inflow reversal if investors, fearing eventual currency devaluation, start withdrawing their capital from that market. A country facing capital inflow reversal may be forced to devalue its currency to deal with the problem, thus becoming a victim of a self-fulfilling prophecy.

The links between capital flows, liberalization, and financial crises in emerging markets have given rise to a debate on the market's ability to manage the size and the direction of capital flows without generating a crisis situation. This debate is organized around the idea that market discipline would restrict the flow of capital to countries with unsustainable economic policies and direct more capital to countries that have prudent and sustainable economic policies. In other words, international private capital will arbitrage across national economic policies in search of sound markets

(Guitian 1998, 1999 and Aliber 2000). This Policy Arbitrage hypothesis suggests that private capital will discriminate between countries with relatively weak and unsustainable policies and those with sound and sustainable policies. The quality of a country's economic policy is, therefore, an important determinant of the size and direction of the foreign capital flows.

Under the Policy Arbitrage hypothesis, it is reasonable to assume that the likelihood of a financial crisis erupting in an emerging market with weak economic fundamentals (unsustainable economic policy) is substantially increased if the market fails to discipline the capital inflows, that is, if policy arbitrage does not occur. The market failure argument has been used recently as a basis for imposing capital controls in countries that are vulnerable to financial crisis. Whether or not the market exerts discipline and policy arbitrage takes place in the market for international capital is an empirical question that has implications for policy. That question is the focus of this study.

The objective of this paper is two-fold. First, we review the recent trends in private capital inflows to emerging markets and examine the developments that typically lead to the loss of investor confidence and financial crisis. Second, we set up an empirical test to determine whether the market exerts discipline on private capital flows to emerging markets with weak economic fundamentals. Evidence of a divergence between capital flows and economic fundamentals will confirm that the market discipline has failed and Policy Arbitrage does not take place. On the other hand, the presence of capital inflows that are consistent with economic fundamentals of a country will support Policy Arbitrage Theory. To carry out this test, we select a group of 22 emerging markets from the list of emerging markets tracked by the International Finance Corporation. We examine the sensitivity of the foreign private capital inflows to the presence of weak economic fundamentals that render a country vulnerable to financial crisis using a cross-sectional approach. Our selection of the countries is constrained by the availability of all the relevant data[1].

The paper is divided into five sections. In the second section, we review the recent trends in private capital flows to emerging markets and discuss the links between private capital flows and financial crisis. In the third section, we design a model to test the response of private capital flows to the presence of unsustainable policies. The fourth section discusses the empirical findings, and the last section contains a summary and conclusion.

[1] Sachs, Tornell, and Velasco's (1996) study used a sample of 20 countries. Sixteen out of these 20 countries are included in our sample.

PRIVATE CAPITAL FLOWS AND FINANCIAL CRISIS

Capital Flow Trends

The cross-border capital flows to developing countries in the 1990s had shifted heavily in favor of private sources, and each type of private source - commercial bank lending, portfolio investments, and direct investments - appeared to have played a key role in this change. This shift is the direct result of the relaxation of capital controls introduced as part of the general liberalization and deregulation programs pursued by countries around the world in the Eighties. It was also a response to the impressive results delivered by some of the emerging economies. The numbers in Table 1 point to the magnitude of this shift. Between 1990 and 1997, the net private capital flows increased at an annual rate of 30%, while the official flows (official development finance) declined at the rate of 3.4% per year during the same period. The portfolio component of the private capital flow increased at a much faster rate of 60%. By 1997, net private capital flows accounted for 86 percent of the total aggregate net flows to developing countries.

Table 1. Aggregate net capital flows to developing countries*

(Billions of dollars)

Year	Official Flows	Private Flows				
		Total	Debt**	Bonds	Equity	FDI
1990	56.4	41.9	15.0	0.1	3.2	23.7
1991	62.7	53.6	13.5	7.4	7.2	32.9
1992	53.8	90.1	33.8	8.3	11.0	45.3
1993	53.6	154.6	44.0	31.8	45.0	65.6
1994	45.5	160.6	41.1	27.8	32.6	86.9
1995	54.0	189.1	55.1	23.8	32.5	101.5
1996	34.7	246.9	82.2	45.7	45.8	118.9
1997	44.2	256.0	103.2	53.8	32.5	120.3

*Includes low and middle-income countries as defined by the World Bank

**Debt includes bonds

Source: Global Development Finance, World Bank, 1998

Cross-border capital flows suffered a temporary slow-down following the Mexican crisis in December 1994, only to bounce back in the later years. The total private capital flows to emerging markets increased about 60 percent and portfolio flows 43 percent in the three years following the Mexican crisis.

After the events in Mexico, one would expect investors to shy away from countries that are vulnerable to financial crisis and focus on the countries that have sound policies and strong economic fundamentals. The resumption of foreign capital inflows to the emerging markets and the speed with which it happened suggest that the private investors' interest in developing countries was not adversely affected by the Mexican crisis. This may mean several things. Developing countries may have

improved their macroeconomic management, following the lessons learned from the Mexican crisis, to maintain foreign investor interest. Alternatively, investors may well not have heeded these lessons for lack of better investment opportunities elsewhere, as indicated by the falling interest rates in the U.S. Another possibility is that, while continuing to pump money to the emerging markets, investors have become more discriminating, and focused on only those countries with sound policies. It is this latter possibility that is the main focus of this paper's investigation.

The Crisis Linkage

The link between foreign capital flows and financial crises in emerging markets has been the subject of extensive research since the Mexican Peso Crisis (Kamin and Roger 1996, Sachs, Tornell and Velasco 1996, Martinez 1998, Guitian 1998, Kaminsky and Reinhart 1996, Frankel and Rose 1996). When foreign capital is allowed to flow freely to a country that follows an exchange-rate based stabilization program, it can lead to changes in the domestic economy that render the country vulnerable to financial crisis. The crisis vulnerability is higher when the country lacks a sound financial structure and prudent supervision. The changes include the appreciation of real exchange rate, weakening of the banking sector, decline in the ratio of reserve to domestic liabilities, and deteriorating current account balance. Sachs, Tornell, and Velasco (1996) examined the connection between financial crisis and the presence of weak economic fundamentals using a sample of 20 emerging markets and their experience around the Mexican crisis period. Their findings confirm the existence of a connection between weak economic fundamentals (appreciating real exchange rate, weakening banking sector, low reserves) and financial crisis.

The premise of the linkage between private capital inflows and crisis vulnerability is that foreign investors are sensitive to nominal depreciation of the currency. An expectation of a nominal depreciation is likely to trigger capital inflow reversal, a fact well-supported by the Mexican and East Asian experiences. The possibility of a nominal depreciation of the currency depends on the country's choice of policy response to a reversal of capital inflows. As Sachs et al. (1996) point out, a country facing a reversal of capital inflows will first run down its reserves, its first line of defense against capital outflow. If capital outflow persists, it then has two choices: (i) depreciate the real exchange rate by devaluing the currency (real depreciation can be brought about only by nominal depreciation in the short run) to bridge the gap between the current and capital account caused by the capital flow reversal or (ii) take monetary policy measures to reduce its domestic absorption and close the gap in the external account caused by capital inflow reversal. The choice of a policy depends very much on the country's economic condition (the health of the banking system, in particular) and the political situation.

Faced with a choice between currency devaluation and monetary policy measures, a country with a weaker banking system is more likely to choose the currency devaluation instead of a monetary policy measure (i.e., raising interest rates) because of the fear of recession and bankruptcies that may result from rising interest rates. The banking system of a country that had overextended its debt portfolio during the period of high capital inflow is likely to find itself in a weak and vulnerable position when a capital inflow reversal occurs. The size of the currency devaluation needed will be directly related to the appreciation of the real exchange rate in the preceding period. The greater the appreciation of the real exchange rate, the larger will be the required nominal depreciation to rectify the problem.

High current account deficits have also been linked to the likelihood of capital inflow reversal and crisis vulnerability. When a country's currency is pegged, rising current account deficits cast doubts on the sustainability of that peg as it raises questions about the country's ability to continue to finance increasing deficits. Though capital inflows help finance current account deficits, the key question concerns the type of imports financed with foreign capital. Excessive use of foreign capital to finance consumption imports can raise questions about a country's ability to sustain the peg and lead the country into serious problems. In Mexico, for example, capital inflows helped to widen the current account deficits by encouraging excessive consumption of imports. This growing current account deficit has been singled out as the main culprit in the peso crisis (Dornbusch and Werner 1994, Dornbusch, Goldfajn and Valdes 1995). Moreover, when the capital inflows are short-term and are held primarily in the financial sector, a growing current account deficit exposes the country to the whims of international capital markets. If investors decide not to finance a country's deficits, fearing that it may have reached its credit limits or for any other reason, their decision can trigger capital inflow reversal and increase the chances of a financial crisis.

THE MODEL

It is assumed that private capital is sensitive to the presence of dangers of financial crisis and currency devaluation and, therefore, will avoid markets that present such dangers. This implies that the market exercises discipline when informed, and policy arbitrage directs the flow of private capital to emerging markets according to the soundness of economic fundamentals. If this is true, there should be a close relationship between the private capital inflows and the economic fundamentals of the recipient countries. We design the following regression model to test this relationship.

$$NCF = ß_1 + ß_2RA + ß_3RE + ß_4BG + ß_5CA + \varepsilon$$

where NCF = change in the net private capital inflow
RA = reserve adequacy
RE = change in the real exchange rate
BG = banking system weakness
CA = current account balance as percent of the GDP

The model is estimated using 1995 and 1996 cross-sectional data on private capital flows and key economic variables for 22 emerging markets. These countries are: Argentina, Brazil, Chile, China, Colombia, Egypt, Hungary, India, Indonesia, Malaysia, Mexico, Morocco, Nigeria, Pakistan, Peru, Philippines, Poland, South Africa, Thailand, Turkey, Venezuela, and Zimbabwe. The choice of years 1995 and 1996 is intended to reflect the reactions of investors to the lessons learned from the peso crisis of 1994.

The dependent variable, NCF, measures the change in the net private capital inflows to a country. It is measured as a percentage change from 1995 to 1996 in the proportion of the total net private capital flows that went to a country. The independent variables, RA, RE, BW, and CG measure reserve adequacy, the change in the real exchange rate, the weakness of the banking sector, and the current account balance as a percent of the GDP, respectively.

The reserve adequacy variable, RA, measures the adequacy of a country's external reserves. External reserves of a country are its first line of defense against capital inflow reversal. As such, the central banks of the emerging markets facing capital inflow reversal are expected to deal with the problem first by driving down their reserves. The presence of an adequate amount of reserves suggests that the authorities will not be forced to adopt harsher solutions such as currency devaluation or a higher interest rate, and, therefore, the country's vulnerability to financial crisis is low. Reserve adequacy is a relative concept. A country's reserves are considered adequate if the quantity of foreign exchange reserves is more than enough to cover the liquid assets that can be converted into foreign exchange. Following the suggestion by Calvo (1996) and Sachs et al. (1996), the reserve adequacy variable, RA, is measured as the ratio of the M2 measure of money to the level of reserves held. A high value for this variable represents a weakness in the economic fundamentals.

The change in the real exchange rate represents the extent of currency misalignment. Its measure, RE, is obtained by calculating the percentage change from the average real exchange rate index for the 1988-1991 period to the average real exchange rate index for the 1992-1995 period. We used the same approach to measure this variable as the one used by Sachs et al. (1996)[2]. The real exchange rate index

[2] See also World Bank's Development Finance, 1998 for a discussion on the measurement of real exchange rate appreciation.

measures the strength of the currency against a basket of other currencies. A positive value of RE, therefore, implies that the real exchange rate has appreciated relative to the base period and has the consequences of discouraging exports, stimulating imports, and increasing current account deficits. The higher the value of this variable, the greater is the vulnerability to financial crisis and currency devaluation.

A weakness in the banking sector increases the chances of currency devaluation when a country is faced with capital inflow reversal. This is particularly true of countries with low reserves and high liquid liabilities. Countries with a weak banking system will be discouraged from taking monetary measures to fight the capital inflow reversal and the gap in the external account it creates for economic and political reasons. A country with a strong banking sector may be able to weather the recession brought about by a monetary policy-induced contraction in absorption and prevent currency depreciation. An ideal measure of the weakness of the banking sector would be the ratio of non-performing loans to total assets. It is, however, difficult to collect data for this variable because of the lack of comparable bank balance sheets. Again, following Sachs et al (1996), we measure this variable, BG, as the ratio of the claims of deposit money banks and monetary authorities on the private sector (line 52d, IFS) to GDP. A high value for this variable also represents a weakness in the economic fundamentals.

The presence of an increasing current account deficit in the context of a pegged exchange rate and weak banking system casts doubts on the sustainability of the exchange rate arrangement and can trigger a speculative attack on the currency leading to a financial crisis. We measure the current account balance, CA, as a share of GDP.

The data for the variables are obtained from the International Financial Statistics (IFS) CD-Rom, the World Bank's Development Finance data base, and JP Morgan Real Exchange Rate Indices. The measures of the explanatory variables for the year 1995 and 1996 are reported in Table 2.

Table 2. Economic Indicators

Country	RA*		RE*		BG*		CA*	
	1995	1996	1995	1996	1995	1996	1995	1996
Argentina	3.251	3.133	10.32	7.69	0.1835	0.1841	-0.875	-1.389
Brazil	4.065	3.745	5.91	16.28	0.3339	0.3073	-2.529	-2.962
Chile	2.296	2.626	13.57	13.97	0.5270	0.5701	0.1578	-2.924
China	9.057	8.158	-12.81	-7.59	1.1082	1.1025	0.2899	1.0382
Egypt	3.165	3.286	-39.02	-28.01	0.3686	0.4168	0.7023	0.6551
Colombia	2.149	2.262	6.63	9.19	0.3982	0.4121	-5.101	-4.885
Hungary	1.303	1.904	23.53	20.04	0.2879	0.2252	-7.322	-3.817
India	7.089	7.716	-25.12	-22.57	0.2846	0.2971	-2.303	-1.145
Indonesia	6.519	6.352	-1.36	-0.04	0.5348	0.5542	-3.791	-2.033
Malaysia	2.667	2.838	4.90	5.17	1.2655	1.34	-8.429	-4.562

Mexico	5.151	5.669	-2.50	-6.93	0.3569	0.2164	-0.55	-0.485
Morocco	6.021	6.135	0.4	3.64	0.3233	0.3104	-4.327	-1.562
Nigeria	8.395	2.075	23.94	86.73	0.2461	0.2335	-9.795	7.4397
Pakistan	10.18	23.59	-2.46	0.57	0.2715	0.2671	-3.562	-6.125
Peru	1.279	1.379	12.73	10.43	0.1492	0.1961	-7.295	-5.437
Philippines	4.813	3.926	2.03	3.24	0.3753	0.4843	-2.671	-4.628
Poland	2.872	3.096	77.32	71.53	0.1745	0.1961	0.9843	-2.767
S. Africa	16.86	36.75	--1.04	-2.97	1.3478	1.3716	-2.119	-1.364
Thailand	3.595	3.874	2.21	0.96	1.3952	1.4304	-8.09	-7.845
Turkey	3.96	6.7	-13.05	-15.93	0.1811	0.2355	-1.352	-0.464
Venezuela	1.831	2.069	-0.04	6.39	0.1196	0.0964	2.6374	5.555
Zimbabwe	2.146	3.044	-17.65	-13.60	0.3151	0.3121	-6.54	-5.65

*RA = reserve adequacy
*RE = change in the real exchange rate
*BG = banking system weakness
*CA = current account balance as percent of the GDP

REGRESSION RESULTS

Under the hypothesis that there is no market failure and policy arbitrage takes place, we expect the coefficient of current account balance to have a positive sign and all other coefficients to have negative signs. We regress the change in the proportion of private capital flows going to a country during the 1995-96 period on the 1995 values of the explanatory variables to test this hypothesis[3].

The regression results are reported in Table 3. All the explanatory variables have the correct signs, and except the variable, BG, all are significant at below 5%.

The regression results support the policy arbitrage hypothesis. The size and the direction of private capital flows to emerging markets are influenced by the economic fundamentals in the recipient countries. Three out of the four indicators in the study (reserve adequacy, appreciation of the real exchange rate, and the current account balance) have statistically significant coefficients and expected signs. These findings do not support the idea put forth by the critics of unregulated capital inflows that private capital does not discriminate and behaves irresponsibly. The proportion of the foreign private capital attracted to a particular emerging market is positively related to the strength of its economic fundamentals. The market appears to respond to the

[3] We also used two other measures, change in the level of capital flows and change in the capital flows as a percent of GDP, for the dependent variable in our regression. No significant difference in the results is found when the change in the level is used. The change in the capital flows as a percent of GDP, however, produced statistically insignificant coefficients for BG and RA. We feel a change in the proportion of capital flows is a better measure for our model. We used the 1995 values for the explanatory variable to capture the investors' reaction to the release of data on economic fundamentals.

declining reserves as an indication of the problems ahead that may lead to currency depreciation.

Table 3. Cross-sectional Analysis of the Sensitivity of the Private Capital Flow

Independent Variables	Coefficients	t-statistics	P-value
Constant	0.795	4.00**	0.0009
RA	-0.089	-3.02**	0.007
RE	-0.012	-2.61**	0.018
BG	-0.037	-0.14	0.894
CA	6.21	2.14*	0.046
R^2	0.54		

The negative and statistically significant coefficient for the exchange rate variable suggests that the market pays attention to the real exchange rate appreciation, as the appreciating real exchange rate becomes unsustainable for an emerging economy operating under exchange-rate based stabilization program and increases the probability of nominal depreciation. This means that emerging markets with appreciated real exchange rates would attract relatively less capital than those with stable real exchange rates.

The coefficient of the current account is also significant, suggesting that the market views growing current account deficits as a sign of the problems to come. A growing current account deficit in the context of pegged exchange rate casts doubt on the sustainability of the exchange rate arrangement and may trigger a speculative attack. Investors anticipating such a crisis avoid those markets.

The coefficient of BG, although negative as expected, is not significant. One interpretation of this finding is that the banking sector weakness on its own was not a major deterrent to private capital inflows to emerging markets. On the other hand, there may be a problem with the measurement of the variable that may explain the result. As pointed out before, an ideal measure would have been banks' non-performing assets. The difficulty of getting information on banks' non-performing assets is well known, and it is particularly true in emerging markets.

SUMMARY AND CONCLUSION

In this paper, we report the results of an empirical test of the policy arbitrage hypothesis relating to foreign private capital flows to emerging markets using the data for years immediately following Mexican peso crisis period. We regress the change in the foreign private capital flows to emerging markets during the 1995-96 period on the

1995 values of four variables (reserves adequacy, change in the real exchange rate, banking sector weakness, and the current account deficit) that represent their economic fundamentals. All the explanatory variables have the correct sign; and all but the variable representing the weakness of the banking sector are statistically significant at the 5% level. In these results, we find support for the policy arbitrage hypothesis. Our conclusion, therefore, is that there is no evidence during the period studied that private capital flows to emerging markets were indifferent to the presence of weak economic fundamentals.

As for the financial crisis that shook Asian countries in 1997-98, many other factors seemed to have been at play. This thought is echoed in Mussa, Zettlemeyer, and Jeanne (1999) when they state, "It is difficult, however, to explain the crisis of the 1990s solely in terms of weak domestic fundamentals and adverse shocks. The Asian crisis was preceded by a rising tide of finance at declining emerging market spreads right up to the devaluation of the Thai baht, notwithstanding public discussion before the crisis of many of fundamental deficiencies now widely diagnosed as having contributed to recent crises…… Finally, the crisis spread quickly, including to countries and regions that were distant in terms of geography and trade linkages…… affected even countries with strong fundamentals and that had little in common with the countries in which the crisis originally erupted."

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