Volume Title: Regional and Global Capital Flows: Macroeconomic Causes and Consequences, NBER-EASE Volume 10

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Volume Publisher: University of Chicago Press

Volume ISBN: 0-226-38676-7

Volume URL: http://www.nber.org/books/ito_01-1

Publication Date: January 2001

Chapter Title: Introduction to "Regional and Global Capital Flows: Macroeconomic Causes and Consequences, NBER-EASE Volume 10"

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Chapter URL: http://www.nber.org/chapters/c10729

Chapter pages in book: (p. 1 - 10)

Introduction

Takatoshi Ito and Anne O. Krueger

Over the past few years, the word "globalization" has increasingly been used to characterize the "new international economy." The term seems to imply a quantum leap from an earlier state of relative isolation of countries to a current situation in which all economic activities are very sensitive to events in distant corners of the world. In some regards, that implication is misleading: Increasing interdependence has been an ongoing phenomenon over many centuries as transport costs have fallen, communications links have improved, and times necessary to cover distances have diminished. In one fundamental regard, however, things have altered dramatically in the very recent past.

That regard is the flows of private capital between nations. After the collapse of the international economy in the 1930s, the architects of the Bretton Woods system presumed that private international capital flows would never again be significant, and they built their postwar architecture (of the International Monetary Fund and the World Bank) on that premise.

That premise was largely valid during the 1950s and 1960s, and most capital flows in that era were from official origins to governments in receiving countries. By the late 1960s, however, private capital flows (in addition to short-term trade credits) had resumed in significant proportions between the United States and Western Europe. By the 1970s, private capital

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flows from industrial countries to a select group of newly industrializing countries were beginning to increase. As late as the early 1980s, however, it was widely assumed that official capital flows would continue to be the main source of longer-term financing between industrial and developing countries.

All that changed in the 1990s, however, as the flow of private capital burgeoned. It is estimated that net private capital flows to emerging markets rose from US$47.7 billion in 1990 (equal to 0.8 percent of their GDP) to a peak of $212 billion, or 3.0 percent of their GDP) only six years later in 1996 (International Monetary Fund [IMF] 1999, table 3.1). In a real sense, the magnitude of capital flows has increased so dramatically, there is no question but that there has been a major change in the economic environment.

The very magnitude of these flows raises important questions as to their effects. Issues arise concerning the differential impact of different types of private capital flows—bank lending, bonds, portfolio investment, and foreign direct investment. Questions also have been put regarding the spillover effects, if any, from various types of capital inflow to the domestic economy in terms of technology transfer, learning by doing, and competition.

The fact that large-scale flows are of such recent origin implies that we know much less than we would like to regarding their effects. To contribute to our increasing understanding of these flows, the National Bureau of Economic Research–East Asia Seminar in Economics (NBER-EASE) agenda has, for the past two years, been focused on aspects of capital flows. At the ninth annual seminar, analysts assessed the microeconomic impacts of some capital flows originating in, or destined for, the various countries of East Asia. At the tenth annual seminar, focus was on the macroeconomic aspects of these flows.

Understanding the determinants and consequences of private capital flows is important for its own sake at any time. But in light of the financial crises taking place in Asia and other countries over the past several years, where the behavior of private capital flows was deemed by most to be an important part of the story of crises, understanding the macroeconomic impact of capital flows and their behavior has become a central concern of policy makers everywhere.

Many questions arise. Private capital flows rose sharply prior to the crisis in most crisis-affected countries. They then reversed abruptly, as investors sought to get their money out. These reversals in themselves constituted huge macroeconomic shocks: In the Asian crisis-affected countries, net private capital inflows constituted 6.3 percent of GDP in 1995, and 5.8 percent of GDP in 1996. They then abruptly reversed (after being positive in the first half of 1997) to a negative 2.0 percent of GDP in 1997 and 5.2

percent of GDP in 1998—a swing of more than 10 percent of GDP in a very short span of time.

Why did capital inflows rise and then fall so sharply? And why did the crises happen in such rapid succession in 1997? What determined the timing of the first (Thai) crisis? Why did the crisis spread to neighboring countries? And why were some economies hard hit into crisis while others (such as Taiwan) were able to weather their difficulties with much less strain and no crisis? As economists have debated this question, two broad schools of thought have emerged. On one hand, there are those who believe that economic fundamentals (the exchange rate regime, the rate of domestic credit expansion, or other key policy parameters) were at fault in the crisis-affected countries. On the other hand, there are those who believe that investors are, at least to a degree, irrational, subject to "herd behavior" or otherwise changing behavior sharply in response to events little related to underlying economic prospects.

A second set of questions arises as to the differences between the 1990s crises and earlier, balance-of-payments crises, experienced by many developing countries. At a superficial level, the difference is obvious: In earlier years, balance-of-payments crises took place in countries with little or no capital mobility and largely inconvertible currencies. In the 1990s, by contrast, the fact that there was substantial capital mobility meant that capital flows were a major part of the payments crisis. Yet in fact, a second—perhaps even more important—difference resulted from capital mobility. That is, a change in the exchange rate (a universal part of the policy response to crisis) not only affected importers and exporters and their profitability contrasted with the producers of nontradable goods (such as wholesale and retail trade, construction, and domestic transportation), it also affected the balance sheets of the banks. Once banks (or major borrowers from the foreign banks) had liabilities denominated in foreign exchange, a change in the exchange rate almost inevitably meant that banks' liabilities rose more than their assets. Under these circumstances, when banking and financial systems were already weak, as was the case in many of the crisis-afflicted countries, the fact that there had to be a sizable change in the nominal exchange rate implied that the financial sector of the economy was greatly weakened.

The consequence was the "financial crises" of the 1990s. These crises combined the old-fashioned balance-of-payments crisis with new difficulties associated with a weakened financial system. Worse yet, recovery from crisis could not really begin until the banking system and financial sector were recapitalized, which in turn often required restructuring of the balance sheets of domestic producers. Any financial crisis—such as those in the United States (S&L crisis) in the late 1980s, in Sweden in 1992, and in Japan in 1997—creates major difficulties and challenges for policy makers;

so, too, does a balance-of-payments crisis. The interaction between the two, however, makes the crisis manyfold more difficult to resolve than were each to be faced alone.

In addition to questions concerning the role played by key policy variables in crisis, and the "rationality" of capital flows, the timing of the Asian crises raised another, related, question: that is, whether crises are contagious. Contagion itself could be rational or irrational: It could be rational if the onset of one crisis serves as a "signal" to market participants who cannot otherwise coordinate that a successful attack on another currency (where fundamentals are weakening but where any one individual getting out of the currency is likely to lose) is now possible; it would be irrational if market participants choose to get out of other countries (without regard to their fundamentals) once one country experiences a crisis.

One way or another, all of the papers in this volume address issues pertinent to understanding the macroeconomic dimensions of capital flows, the origins of the 1990s-style crises, the linkages between the foreign exchange variables and the financial variables, and the key questions associated with efforts to solve the crises.

The first several papers cover macroeconomic aspects of capital flows that are relevant for understanding the causes of crisis. The first paper, by Corsetti, Pesenti, and Roubini (CPR), directly addresses the relative importance of financial fragility and external imbalances in the Asian financial crises. In their view, weak fundamentals explain why countries went into a crisis. They contribute to rapidly growing literature on this subject by using "cross-variables." CPR thus find that large current-account deficits significantly increase the probability of a crisis when a country's reserves are low (but do not do so when they are high). They likewise find that real exchange rate appreciation, associated with large current-account deficits, is a significant fundamental. Even more significantly, their results suggest that neither current account deficits nor financial fragility alone seem to cause a financial crisis, but that the presence of a large current-account deficit combined with financial fragility does.

Measures of financial fragility, including the extent of nonperforming loans in the banking system prior to the crisis, and the estimated magnitude of the costs of restoring the banks to solvency are all statistically significant. As Corsetti, Pesenti, and Roubini note, however, "Per se, these results cannot discriminate across alternative explanations of currency crises based on self-fulfilling speculative attacks, as opposed to fundamental factors. They do, however, identify a set of variables that appear to enhance the vulnerability of an economy to a crisis."

In the second paper, Aaron Tornell also examines the linkages between currency and financial crises, and then examines the similarities between the Asian crises of 1997 to the "tequila" crisis in Mexico at the end of 1994. Tornell starts by noting that there are two issues: On one hand, there

is a question as to which countries are hit by crises; on the other hand, there is a question as to the timing of the crisis. He recognizes that forecasting the timing of any crisis is difficult, but seeks to ask whether, once there is a crisis somewhere, fundamentals determine which countries are affected.

He finds that countries with "sound fundamentals" (real exchange rates that have not appreciated, the strength of the banking system, and the liquidity of the central bank) are not likely to be vulnerable to crises even when one occurs somewhere else in the world. However, countries whose fundamentals are weaker are vulnerable to crisis, in the sense that if one country is in crisis, the other countries will be attacked if investors turn pessimistic (as they may after a crisis has occurred in one country). Tornell notes that this conclusion implies that, once fundamentals are weak, the risk of crisis is linked to investors' expectations. To the extent that those expectations shift abruptly, countries may experience crisis. Insofar as investors' expectations cannot be explained, the timing of crises cannot be explained.

Two papers examine the role of bank lending in contagion. In the first, Kaminsky and Reinhart calculate the conditional and unconditional probabilities of crisis based on the usual economic variables but including the existence of crisis elsewhere. They conclude that contagion is more regional than global; i.e., that if an Asian country experiences a crisis, other Asian countries are more likely to be attacked than Latin American countries. They also conclude that susceptibility to contagion increases rapidly as more countries go into crisis: If only one country has a crisis, the likelihood of contagion is reasonably small; if two countries are in crisis, however, the odds of contagion increase dramatically. Kaminsky and Reinhart also examined the extent to which trade ties and financial ties between a crisis country and other countries affected the likelihood of crisis in the other countries. They found that close financial ties are more likely to result in contagion than close trade ties. This was the case with Argentina and Mexico, where trade links are very small while financial links are significant, and between Thailand and Indonesia, where the same pattern prevails.

In his paper, Shin-ichi Fukuda attempts to understand the behavior and role of banks and bank lending in the crisis. He develops a model of asymmetric information, in which borrowers know whether they are creditworthy but lenders cannot distinguish between them until there is some difference in their behavior. Lenders can lend for either one or two periods, and bank monitoring can reveal the creditworthy borrowers after one period. In Fukuda's model, creditworthy borrowers seek to reveal their own type, while other borrowers attempt to conceal theirs. The result, in the model, is that there is a trade-off: Efforts to borrow short-term on the part of creditworthy borrowers, and monitoring of loans by banks, can increase the efficiency of the financial system. However, there is also a risk of liquid-

ity problems, and a higher proportion of debt with short maturity increases the likelihood of significant costs associated with periods of illiquidity. As Fukuda recognizes, his model provides one step in understanding bank behavior and the possibility that there can be more than one equilibrium position (and therefore that there can be a rapid shift between good and bad states).

The next two papers examine various aspects of exchange rate behavior as they related to the crises. It was already seen that both Corsetti, Pesenti, and Roubini and Tornell found that vulnerability to crisis was increased with an appreciating real exchange rate and a widening current account deficit. This calls into question the role of the exchange rate regime in making countries vulnerable to crisis. Certainly, the Asian and Tequila crises came about after a substantial period during which the exchange rate regime had had a de facto dollar peg, at least implicitly. On one hand, the dollar peg made the currency more overvalued as the yen depreciated relative to the dollar; on the other hand, for countries whose rate of inflation was above that of the United States and Japan, there was real appreciation on that account.

Moreover, the dollar peg system seemed to reduce currency risk for investors, and thus attracted large capital inflows. These inflows in turn resulted in "overheating" of the Asian economies or a large accumulation of short-term liabilities which made the countries vulnerable for a crash. A central question is whether an alternative currency regime would have made the Asian economies less vulnerable to crisis.[1]

The first of the papers that bear on this issue is by Ogawa and Sun. They first used actual data to estimate regression equations with instrumental variables such as the interest rate, the exchange rate, the rate of export growth, and the rate of change in stock prices to estimate capital flows. They then developed a simulation model to estimate what would have happened under alternative exchange rate regimes in which exchange rates moved as a weighted average of the yen and dollar rates (i.e., had adopted a currency basket peg). According to their model, capital inflows into Thailand and Korea would have been significantly reduced in the period from 1986 to 1997 under the currency basket, and those to Indonesia would have declined somewhat. Interestingly, although both Japanese investors (in yen) and American investors (in dollars) are sensitive to exchange rate swings, American investors appear to respond more strongly, so that in the period when the dollar was constant in nominal terms, foreign investment was attracted to a greater extent than it would have been under a currency basket system. Ogawa and Sun conclude by noting that,

1. There is a growing consensus among the policy making community that the only defensible exchange rate regimes are floating or dollarization. There is, however, less empirical evidence to support this conclusion than would be desirable, and the papers in this volume represent significant progress in providing empirical support for that proposition.

although the exchange rate regime was a factor inducing large capital inflows, other factors (such as deregulation of capital flows) may also have contributed, and that further research is called for to estimate the importance of these factors in surges of capital inflows.

The second paper is by Takagi and Esaka, who investigate how monetary authorities responded to large and rapidly increasing capital inflows. They note that foreign direct investment constituted about half of the East Asian capital inflows in the 1980s, but that by the 1990s, short-term borrowing by banks and corporations was the bulk of capital inflows in most countries (Malaysia was an exception) and were, as already noted, very large. While there are significant benefits to capital inflows, they can impose costs because rapid monetary expansion, inflationary pressures, real exchange rate appreciation, and widening current account deficits can result. And, of course, large outstanding indebtedness increases vulnerability to capital outflows.

Takagi and Esaka question the extent to which monetary management in the capital-receiving countries was appropriate. They note that official foreign exchange reserves rose significantly during the period of capital inflow, indicating that the current account deficits were smaller than the capital inflows by about a third. This means that there was sterilization of capital inflows, which in turn implies that monetary policy was tighter, and interest rates higher, than they otherwise would have been. That, in turn, was undoubtedly a factor in increasing the size of the inflows, contrasted with what they would have been at lower interest rates. Takagi and Esaka then estimate a quarterly model for determinants of monetary aggregates. They conclude that capital inflows into the Asian countries were significantly larger than they would have been in the absence of sterilization.

One economy that escaped the crisis was that of Hong Kong, although the currency was attacked during the summer of 1998. Hong Kong has had a currency board under which there is no independent monetary policy and the exchange rate is rigidly fixed. Since the Asian crisis, many observers—noting the difficulties associated with the fixed nominal exchange rate, or dollar peg, system—have advocated currency boards. In their paper, Kwan, Lui, and Cheng analyze how the currency board system in Hong Kong functioned. They start by examining the policies used by the Hong Kong Monetary Authority (HKMA), which started with a period during which it operated according to set rules. It then switched to a regime in which it used more discretion. Now, finally, it has switched back to a rules-based regime.

In their paper, Kwan, Lui, and Cheng provide a valuable history of the operations of the HKMA and, in addition, attempt to measure the credibility of the system in each of the periods, using methods developed in the target zone literature. They find that the HKMA was far more credible in the period during which it followed rules than when there was more discre-

tion in its operations, and conclude that the use of discretion at the time of the Asian crisis contributed to the erosion of market confidence and made a speculative attack on the currency more likely. While results for Hong Kong would not necessarily hold for other countries if they were to adopt currency boards, the paper provides valuable insights into the functioning of the Hong Kong board.

One of the issues arising out of the financial crisis has been differences in types of capital flows. As suggested by the Fukuda model (and in much other work), many analysts have been suspicious of bank lending—especially short-term bank lending—as making countries much more vulnerable to crisis than they would be if capital inflows were more heavily weighted toward foreign direct investment (FDI), long-term bonds, and equity investments. Three papers at the conference addressed aspects of these issues. Many policy makers and analysts have argued that FDI and equity investments are much less susceptible to sudden departures in times of crisis, and thus are much less volatile than short-term capital flows and especially bank lending.

In his paper, Fukao analyzes the behavior of manufacturing subsidiaries of Japanese companies located in Asia, in an attempt to ascertain how these firms (which were presumably either established by the parent company through FDI or acquired through equity investment) behaved during the crisis. He finds that, in the months following the Asian crisis, Japanese subsidiaries did not reduce employment, although they did not undertake any further new investments. The greater the profitability of the parent company, the greater the likelihood that a subsidiary would maintain employment, suggesting that subsidiaries receive support from their overseas owners during periods of crisis, which may offset part of the impact of the crisis on the economy in which the subsidiary operates. Fukao also found that subsidiaries with strong export positions were able to fare quite well after crises, especially contrasted with subsidiaries whose sales were directed largely toward domestic markets. These latter experienced much more difficulty than their trade-oriented counterparts.

In their paper, Razin, Sadka, and Yuen (RSY) raise some questions about the relative superiority of FDI. They note that FDI has two types of effects. It is beneficial in that it can promote technology transfer, permit the importation of new intermediate goods, and lead to more competition. RSY also point to the stability of FDI in times of financial crisis, and note that FDI may constitute the only remaining link between domestic and international capital markets in times of crisis. However, if there are asymmetric information issues resulting from FDI, those effects can—in their model—result in underperformance of the domestic equity market and thus offset part or all of the benefits of FDI.

In their model, this result comes about because FDI combines foreign and domestic savings, and gives managerial control and inside information

about firms' prospects to foreigners (in the firms in which they have invested). With their inside information, foreigners keep equity in firms with good prospects but sell off equity in firms that are likely to be less profitable. Domestic residents do not have insider information, but because of adverse selection their average returns on investment are smaller than they would be if they could choose across the entire range of firms. RSY then proceed to develop a simulation model to attempt to quantify the relative magnitude of the beneficial and the distorting effects of FDI. They find that, for plausible values of the parameters, it is possible that the adverse selection problem may dominate.

In addition to the types of evidence brought to bear on capital flows in the papers already discussed, issues arise with respect to individual countries. In many ways, South Korea's crisis was the most surprising of them all: The country had had an outstanding record of economic growth and rising living standard continuously since 1960. Exports had grown from miniscule levels to make South Korea one of the leading exporters in the world; savings rates had risen; the government budget had been balanced; and inflation had been tamed.

With that enviable track record, researchers have focused a great deal of effort on analyzing the Korean experience. The final paper in the volume examines capital inflows and their role in the crisis from the perspective of the Korean economy. Dongchul Cho and Kiseok Hong try to assess the relative importance of internal factors as contrasted with the external environment (and especially the crisis that had already engulfed Indonesia, Malaysia, and Thailand) in triggering the crisis in South Korea. Cho and Hong examine the various factors that are regarded as important in the fundamentals and in contagion. They conclude that the crises in other countries weakened the Korean economy, but that they alone could not have caused the crisis. Instead, Cho and Hong believe, Korean economic policies, especially in the financial sector, were weaker than was generally perceived. Moreover, they assert that Korean investors believed that the government would bail out the *chaebol,* and continued acting on that belief until the crisis came. Foreigners, by contrast, were more skeptical that a bailout was certain, and hence were the ones who tried to get out of won and Korean investments first. When the first signs of imminent trouble appeared, policy responses were inappropriate and made the onset of the crisis. Cho and Hong thus see the Korean crisis as based on fundamentals, but made worse by contagion effects and policy mistakes in initial efforts to cope with it.

There is, of course, a great deal more to be learned about the interaction between foreign exchange and financial markets in crises, about the timing of crises, about the degree to which contagion can make even countries with sound policies vulnerable, and about the most promising policy approaches to mitigating crises. Yet despite the differences in emphasis across

these papers, the reader will recognize a strong consensus on a number of things: the importance of fundamental economic policies, the role of financial and exchange-regime weaknesses in contributing to crisis, and the role of different types of capital flows in contributing to them. It is doubtful whether analysis can yield sufficiently conclusive results that crises can be a thing of the past. Lessons learned and research results such as these, however, can make future crises less severe when they do happen, and can make their onset less likely.

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