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# Introduction

Sebastian Edwards and Jeffrey A. Frankel

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Financial crises have become recurrent, profound, and diverse. When Richard Cooper gave the Graham Memorial Lecture at Princeton in 1971, currency crises followed a regular pattern across countries. Most financial crises in emerging markets could be traced to large fiscal imbalances financed by the local central bank, and this remained true until the mid-1990s. In a world with fixed nominal exchange rates and limited capital mobility, excessive domestic credit creation leads to a trade deficit, the depletion of international reserves, and, eventually, a devaluation crisis.<sup>1</sup> Theoretically, this prototypical crisis is neatly explained by Krugman's (1979) "first-generation" speculative attack model. Kamin (1988), Edwards (1989), and Edwards and Santaella (1993) studied in detail more than sixty currency crises in the 1950–85 period and concluded that most of them were indeed rooted in inconsistent fiscal policies. In this world of "first-generation" crises, crisis prevention policies are rather straightforward: By running a balanced public sector budget, the country in question can avoid a drop in international reserves and, thus, will be spared from a currency crash.

In 1995 Michel Camdessus, then the International Monetary Fund's managing director, said that the 1994 devaluation of the Mexican peso was

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1. Chile's currency crisis of 1982 is an important exception to this pattern. The collapse of the peso took place in a context of fiscal surplus and was largely the result of capital inflows reversals and a weak domestic banking sector.

the first financial crisis of the twenty-first century. By this he meant that the Mexican crisis did not fit the old pattern of fiscally driven currency collapses. Although in 1994—and partially due to a contested presidential election—Mexico had in fact relaxed its fiscal stance somewhat, the macroeconomic picture was far from fiscally inconsistent. The country had made enormous strides toward fiscal discipline in the years since the crisis of 1982. At the heart of the 1994 Mexican crisis were investors' souring expectations, a rapid reversal of capital flows, and mounting dollar-denominated short-term debt (the infamous *tesobonos*). These, in turn, were attributable to an overvalued peso, some domestic political shocks, increases in U.S. interest rates, and a weak banking sector. The rapid decline of international reserves during 1994 and the eventual collapse of the peso in December of that year were the result of the combination of these factors, and not of an overly expansive fiscal policy.<sup>2</sup> Even more clearly than in the case of Mexico, the currency crises in East Asia in 1997 represented an important departure from the first-generation explanation. In virtually every one of the East Asian crisis countries, the fiscal accounts were largely under control. Also, as in Mexico, short-term foreign debt—and in particular debt to international banks—was high in all of these countries. In East Asia the domestic banking sectors were weak and poorly supervised. Once the currency came under attack, an already volatile situation became explosive.

After the collapse of the Thai baht in July of 1994, the crisis was rapidly propagated across East Asia. Even the currencies and financial markets of some economies that were thought to have among the strongest fundamentals in the world—Taiwan, Hong Kong, and Singapore—were intermittently attacked during 1997 and 1998. The extent to which currency crises are transmitted across countries—what sometimes is referred to as “contagion”—became particularly important in 1998 when, as a result of the Russian currency collapse, the currencies, bonds, and stock markets of virtually all emerging-market countries around the world came under severe pressure. A statement by Mexico's Secretary of the Treasury José Angel Gurría vividly captures policy makers' concerns and frustrations with financial contagion: “Ninety percent of Mexicans have never heard of the Duma, and yet the exchange rate and interest rates that they live with every day were being driven by people with names like Kiriyenko and Chernomydrin and Primakov” (Gurría 1999).

The situation eased toward the end of 1998. When Brazil finally succumbed to the speculative pressure by devaluing in January 1999, the adverse effects on the real economy that the East Asia crisis had led us to expect did not materialize. Nevertheless, the end of the decade offered little hope that we had seen the end of crises in emerging markets. Argentina and

2. To be sure, these factors in addition to mounting political instability resulted in a decline in the demand for money in Mexico. The fact that the Bank of Mexico sterilized the decline in reserves during most of 1994 made things worse.

Turkey were both placed under intense speculative pressure in the fall of 2000. In the face of doubts regarding its political ability to address internal problems, particularly regarding banking, Turkey was ultimately forced in February 2001 to abandon the exchange rate policy that had been the foundation of its still-new stabilization program. By the end of 2001, Argentina's decade long experiment with a fixed exchange rate and a currency board had collapsed.

In the last few years, and in an effort to explain the crises of the 1990s, scholars have developed new, "second- and third-generation" models of speculative attacks and currency crises. The second-generation models feature "multiple equilibria" that are consistent with a given set of fundamentals; they emphasize that even a country with relatively strong monetary discipline can be hit by a crisis. The third-generation models return to fundamentals, but they locate the problem in moral hazard and the structure of the countries' financial system, rather than in macroeconomic policies. Some truth lies in each of these sets of factors, and each is represented in our volume.

The papers collected in this volume were presented at a conference in January 2001.<sup>3</sup> The main purpose of the conference was to bring together a group of academics, officials in the multilateral organizations, and public- and private-sector economists to discuss issues related to the prevention of financial crisis in the emerging-market countries. (A companion conference was held two months later to discuss the management of crises in emerging-market countries once they occur. The corresponding volume is *Managing Crises in Emerging Markets*, edited by Michael Dooley and Jeffrey Frankel.)

In organizing this conference, our point of departure was the idea that, because of the changing nature of financial crises in the emerging economies, it was necessary to seriously rethink prevention policies. We were particularly interested in examining the most important characteristics of recent crises in light of new and rapidly evolving theories. To this end, we called on both theoretical and applied economists, and we made an effort to include specific case studies as well as broad cross-country comparisons. The topics covered in the conference included exchange rate regimes, contagion, the current account of the balance of payments, the role of private-sector investors and of speculators, the reaction of the official (including the multilateral) sector, capital controls, bank supervision and weaknesses, the role of large players (including hedge funds), and the role of cronyism and corruption.

We have divided the rest of the volume into five parts. In part I we deal with the role of the current account and trade flows in financial crises. Part II concentrates on international financial players—including banks, large hedge funds, private investors, and speculators—and on the channels

3. The paper by Reinhart and Reinhart, however, was presented at the accompanying conference held in Monterey, California, in March 2001.

through which crises are transmitted across countries. In part III we include two papers that analyze the effectiveness of capital controls as a way of preventing a crisis from becoming massive and costly. Because Malaysia is the one major country to have responded to the crisis in 1998 by imposing capital controls, both papers in this section focus on that experiment. Part IV is devoted to the role of balance sheets, crony capitalism, and corruption. Finally, part V serves to highlight an essay that surveys the main characteristics of the “new” financial crises.

### **Part I: The Current Account and Vulnerability to Crisis**

In “Does the Current Account Matter?” Sebastian Edwards investigates in detail the behavior of the current account in emerging nations, and in particular its role—if any—in financial crises. Edwards reviews alternative models of current account behavior and develops a dynamic model of current account sustainability. The empirical analysis is based on a massive data set that covers over 120 countries during more than twenty-five years. A main goal of this paper is to analyze whether there is evidence supporting the idea that there are costs involved in running very large deficits.

Edwards argues that equilibrium models of frictionless economies are of little help in understanding actual current account behavior or assessing a country’s degree of vulnerability. He shows that, although current models of current account sustainability provide useful information about the long run, they are of limited use in determining if a country’s current account deficit is too large at a particular moment in time.

Edwards’s empirical analysis shows that large current account deficits are not persistent. Very few countries run large deficits for as much as five years in a row, and only a handful have run large deficits for ten years. The data suggest that the typical mechanics of current account deficits is that countries that experience large imbalances do so for a limited time; after a while these imbalances are reduced, and a current account reversal is observed. An analysis of current account reversals using a large (unbalanced) panel of countries for 1970–97 indicates that, contrary to what has been recently suggested, reversals do have a negative effect on economic performance. They negatively affect aggregate investment; moreover, even after controlling for investment, the regression analysis suggests that reversals have a negative impact on gross domestic product (GDP) growth. The Edwards chapter also addresses the narrower question of whether larger deficits increase the probability of a country’s experiencing a currency crisis. The analysis suggests that the answer to this question depends on the definition of *crisis*, as well as on the sample used in the analysis. When Africa is excluded from the sample, an increase in the current account deficit raises the probability of a crisis, independently of how *crisis* is defined.

In “Are Trade Linkages Important Determinants of Country Vulnerabil-

ity to Crises?” Kristin J. Forbes uses a comparative data set with forty-eight countries to investigate the importance of trade channels in the international propagation of financial crises. After surveying the literature on trade effects, Forbes develops an analytical framework that considers three possible channels through which international trade can affect the propagation of crises: a competitive effect, an income effect, and a bargain effect. The competitive effect is related to the way in which a major devaluation affects relative prices in the world economy. If the crisis country is large enough, a devaluation of its currency will result in cross price effects, negatively affecting prices of other countries’ exports. The income effect is a more traditional transmission channel and is related to the decline in real income in the crisis country and the consequent decline in its demand for imports. Countries that export heavily to the crisis country will, thus, be affected by a reduction in their own exports. The final effect—the so-called bargain effect—allows a noncrisis country to import selected goods at a bargain price.

In the empirical application of this framework, Forbes uses a vast comparative data set, covering forty-eight countries during the period 1994–99. The countries in her data set experienced sixteen crises during this time period.<sup>4</sup> A particularly important contribution of this paper is the construction of a new competitiveness indicator, which uses micro-level data to calculate the way in which a crisis affects bilateral exports. Using data on stock market returns for each of the forty-eight countries, Forbes investigates the relative importance of the effects described above on the international propagation of crises. Her findings suggest that countries that compete with exports from a crisis country experience significant reductions in stock returns in the period following a crisis. Likewise, countries that export heavily to crisis countries are affected by financial turmoil. Interestingly, Forbes’s results suggest that trade channels are indeed more important than standard macroeconomic channels in explaining the international propagation of financial crises. According to Forbes, her analysis has important implications for adjustment and assistant packages by the multilateral organizations. In particular, she argues that crisis-related adjustment packages that ignore these trade linkages will tend to be somewhat ineffective in reducing the negative effects of financial crises on other nations.

## Part II: International Financial Players and Contagion

In “What Hurts Emerging Markets Most? G3 Exchange Rate or Interest Rate Volatility,” Carmen M. Reinhart and Vincent Raymond Reinhart analyze the way in which advanced countries’ exchange rate policies affect

4. As do many of the authors in this volume, Forbes uses the Eichengreen, Rose, and Wyplosz (1996) definition of *crisis*. For an alternative definition of *crisis*, see Frankel and Rose (1996).

emerging countries.<sup>5</sup> In particular, the Reinharts ask whether reducing Group of Three (G3) exchange rate volatility—through the adoption of a target zones exchange rate system, for instance—would reduce emerging markets’ macroeconomic vulnerability. Since most emerging markets’ debt is expressed in U.S. dollars, a more stable dollar exchange rate could, in principle, help the poorer nations. The authors point out that reducing G3 exchange rate volatility implies an important trade-off. In particular, since sterilized intervention is largely ineffective, reducing exchange rate instability would require an active use of monetary policy. Monetary intervention, in turn, will have an effect on G3 interest rates. The trade-off, then, is that lower G3 exchange rate instability will be translated into higher G3 interest rate volatility.

Based on the North-South links literature, Reinhart and Reinhart develop a framework with which to analyze the way in which exchange rate and interest rate policies in the advanced countries affect capital flows to the emerging countries. In their empirical analysis they look in detail at the behavior of capital flows to a large number of developing countries. They consider the period 1970–99 and concentrate on six groups of countries. An important finding in their analysis is that, historically, G3 exchange rate volatility appears to have no effect on (net) capital flows to the emerging nations. This is the case when all poorer countries are considered as a group, as well as when the individual regional groups are analyzed. They do find, however, that higher G3 exchange rate volatility has been associated with lower portfolio flows to the emerging nations. An increase in direct foreign investment compensates for this drop in private portfolio capital. Reinhart and Reinhart’s detailed empirical investigation leads them to conclude that “from the perspective of the emerging-market economies, the case for limiting G3 exchange rate volatility is not proven.”

In “When is U.S. Bank Lending to Emerging Markets Volatile?” Linda S. Goldberg uses new data to analyze U.S. banks’ lending practices toward emerging nations. In particular, she investigates the extent to which U.S. banks that lend to the emerging markets respond to changing macroeconomic conditions, both in the United States and in the borrowing countries. An important feature of this analysis is that the author makes formal comparisons between U.S. lending to emerging and industrialized nations. Goldberg uses an extensive data set drawn from the Country Exposure Reports filed by individual U.S. banks with the Federal Financial Institutions Examinations Council (FFIEC). This unique data set contains over 20,000 observations and provides detailed information on individual U.S. banks’ claims on foreign countries. Goldberg estimates a series of panel regressions

5. This paper was not discussed at the conference at Cheeca Lodge, Islamorada. Instead, it was presented and discussed at the accompanying conference on “Managing Currency Crises in Emerging Markets,” which was held in March 2001. Because the paper deals with “crisis prevention” issues, we decided to include it in this volume.

to analyze the way in which U.S. banking responds to cyclical conditions abroad and in the United States.

Goldberg finds that during the last twenty years a larger number of banks have become engaged in international lending to emerging nations. She also finds that smaller U.S. banks tend to concentrate their lending to Latin America. Smaller banks' international lending to the emerging nations is more volatile than lending by larger banks. Large banks, on the other hand, tend to concentrate on lending to the industrialized nations. A particularly important finding of this study is that foreign countries' macroeconomic developments—either their rate of GDP growth or the behavior of their domestic interest rates—do not appear to affect U.S. banks' international lending decisions. On the other hand, macroeconomic conditions in the United States are an important determinant of U.S. banks' international lending. When the U.S. economy expands, U.S. banks' lending to other industrialized countries tends to expand. However, U.S. economic expansions are associated with a contraction of U.S. banks' lending to Latin America and Asia. Perhaps the most important conclusion of Goldberg's analysis is that, overall, U.S. bank lending to emerging nations has not been particularly volatile. On the whole, there is no evidence of lending retrenchment during times of crisis.

The role of large market participants—including hedge funds and other highly leveraged institutions—is the subject of the chapter by Giancarlo Corsetti, Paolo Pesenti, and Nouriel Roubini, “The Role of Large Players in Currency Crises.” Most models assume that speculators are numerous and atomistic in their behavior: each player acts in self-interest and considers himself too small to have an effect on the market price. Indeed, financial markets are usually thought to meet this ideal of neoclassical economic theory better than markets in almost any other good or service. If there are speculative bubbles or attacks that take the market price away from fundamentals, it is not due to any deliberate market manipulation by individual speculators.

Given the interest in “George Soros” and other players who are large enough to affect the market—for example, allegations of market manipulation in Hong Kong in 1998—some attention to the possible role of larger players is overdue. In this chapter, the authors present a model in which the presence of a large trader can increase the chance of a crisis. Size is defined in terms of market power, which is in turn determined by access to information that others lack, and not by the magnitude of financial resources alone. The setting is the sort of second-generation model developed originally by Obstfeld (1994): A speculative attack is the outcome of a prisoner's dilemma game, in which each speculator sells the currency for fear that he will be left “holding the bag” if he is the only one *not* to sell. A large trader matters because, for any given set of fundamentals, he affects the probability that the others will undertake a speculative attack. Specifically, his presence makes others more aggressive in their behavior.

Some case studies offer evidence suggestive of the role of large players.



Examples include the attack on the Thai baht in 1997, the crisis in Malaysia in 1997–98 that prompted the prime minister to point the finger at foreign speculators, the “double play” on the Hong Kong stock and foreign exchange markets in 1998, and pressure on the Australian dollar in the summer of 1998.

In “Contagion: How to Measure It?” Roberto Rigobon discusses the mechanisms through which currency crises are propagated across countries. He uses high-frequency data to investigate the way in which financial disturbances—including those that are associated with a financial crisis—are transmitted from country to country. He asks whether particular channels, such as trade links or common creditors, affect the international transmission of disturbances. In addition, Rigobon analyzes whether the parameters that capture the main features of the transmission mechanism experience structural breaks at the time of a crisis.

Rigobon argues that empirical models traditionally used to address “contagion” issues are subject to serious limitations. In particular, he points out that in the presence of heteroskedasticity, omitted variables, or simultaneous equation problems, traditional tests—including standard tests that look for structural breaks—are subject to serious biases. In light of these limitations of traditional methods, Rigobon suggests a new approach to testing for parameter stability under very general conditions. This new approach is valid if two assumptions are met: the analysts know in which country the crisis was initiated, and changes in the other countries’ covariance matrixes are generated by disturbances emanating from the crisis country. Rigobon uses his new procedure on high-frequency data for emerging-market bond and stock market returns. His results suggest that trade linkages and regional proximity affect the extent to which disturbances are transmitted internationally in the bond market. Interestingly enough, his results indicate that these variables play no significant role in the transmission of disturbances across different national stock markets.

In “Credit, Prices, and Crashes: Business Cycles with a Sudden Stop,” Enrique G. Mendoza discusses the role played by “sudden stops” of capital inflows in triggering a financial crisis. Mendoza begins his discussion by arguing that sudden stop (SS) episodes are qualitatively different from standard balance-of-payments crises. Although in the latter case the economy experiences a deep collapse, followed by a rather sharp recovery, in a run-of-the-mill balance-of-payments crisis the economy suffers a prolonged recession. Mendoza develops a model of an economy subject to *excess volatility*, which is able to capture the main features of SSs. In this model, under most states of nature the economy functions in a frictionless fashion. There are some states of nature, however, in which the economy becomes subject to a binding credit constraint. More interestingly, the economic frictions and distortions set in motion by this credit constraint can be triggered either by investors’ expectations or by foreign or domestic shocks.

Mendoza's analysis has important implications for crisis prevention policies: First, regulatory policies that increase the probability of the credit-constraint state of nature can be highly counterproductive. These policies would include liquidity requirements, value-at-risk collateralization, and margin requirements. Second, programs aimed at avoiding SSs—contingent credit facilities, for instance—need credibly to commit very large amounts of funds. Third, in the longer term, SS crises can only be avoided (or minimized) through the implementation of micropolicies aimed at eliminating the credit-market imperfections that are at the root of this phenomenon.

Mendoza uses his model to investigate the dynamics of the 1994 Mexican peso crisis. After calibrating the model with Mexican data, Mendoza addresses three key questions: how frequent, how large, and how costly SSs are. The main conclusions from this exercise are that the possibility of SSs has a very small effect on the long-run characteristics of the business cycle. However, SSs can be large and can potentially have very large negative welfare effects. For instance, in one of the exercises, an SS can generate a decline in output of nontradable goods on the order of 10–20 percent of GDP. Mendoza argues that an important implication of this type of analysis is that increased policy credibility, of the type achieved by dollarizing the monetary system, can go a long way toward reducing the importance and costs associated with SSs.

### **Part III: Capital Controls: The Malaysian Experience**

In the aftermath of the East Asian crisis, a number of analysts argued that unrestricted capital mobility was at the center of global financial instability. People as different as former World Bank Chief Economist Joe Stiglitz and financier George Soros have endorsed the view that speculators focus exclusively on the short run and tend to flee countries at the first signs of trouble. Worse yet, speculators are often affected by rumors, stampeding toward the exit and leaving behind them a wrecked financial sector.

Supporters of this view have argued that restricting capital mobility would reduce the frequency and depth of financial crises in emerging nations. Much of the recent debate on capital controls has centered on the benefits of controls on capital inflows, similar to those implemented by Chile between 1991 and 1998. This type of capital control is aimed at limiting the volume of short-term flows, tilting the composition of capital flows toward the longer run.

While many economists believe that price-based controls on inflows may be a useful tool for mitigating financial instability, most are quite negative about controls on capital *outflows*. Malaysia's decision to impose controls on capital outflows in September of 1998 was received with skepticism and alarm by the international financial community. The vast majority of analysts argued that these controls would create serious distortions, scare off investors, and retard growth. Until now, there has been no systematic eval-

uation of Malaysia's experience with controls on outflows during 1998–99. The two chapters in this part of this volume address the Malaysian episode in detail.

Ethan Kaplan and Dani Rodrik's "Did the Malaysian Capital Controls Work?" provides a detailed empirical evaluation of Malaysia's unorthodox reaction to the currency upheaval of 1997–98. The authors note that officials at the International Monetary Fund (IMF) and the major investment banks argued that these controls, and the accompanying decisions to peg the exchange rate and lower domestic interest rates, would result in a slower recovery and a significant reduction in foreign direct investment (FDI) into Malaysia. This latter (potential) effect of capital controls was considered to be particularly devastating, as Malaysia has traditionally relied very heavily on FDI. In light of developments in the region since September 1998 (Malaysia did recover, but so did Korea and Thailand, which did not rely on controls) the majority of analysts believe that the imposition of controls on capital outflows did not work in Malaysia. According to the authors, however, this reasoning is flawed because it ignores a key difference in the timing of the adjustment programs: Korea and Thailand started their respective adjustment programs in mid- and late 1997, whereas Malaysia did not seriously launch its (heterodox) adjustment program until September 1998.

In order to take this timing issue into account in an evaluation of Malaysia's program, the authors implement a "time-shifted differences-in-differences" technique. This methodology allows them to compare these countries' performance relative to the launching of their respective programs. Better yet, this technique permits the authors to evaluate directly the effects of the Malaysian capital controls on the country's macroeconomic performance, relative to the counterfactual of an IMF program. Their analysis concentrates on a number of key macroeconomic variables, including real GDP, industrial production, inflation, interest rates, and a series of financial sector indicators. The results from this analysis suggest that, when measured relative to the launching of the respective programs, Malaysia's heterodox-cum-capital-controls program fared better than Korea's IMF-sponsored adjustment programs. As the authors show, however, if a standard difference-in-difference estimation is performed, Malaysia's program does not look so effective. In concluding their analysis, Kaplan and Rodrik "invite the reader to make up his or her mind on which of these counterfactuals makes more sense."

In "Malaysia's Crisis: Was it Different?" Rudi Dornbusch approaches Malaysia's experience with capital controls from another angle. Dornbusch asks whether Malaysia's rather solid performance in 1999–2000 can be attributed to its heterodox program, or whether it was the result of other factors, including a friendly international economic environment. In this chapter Dornbusch argues that Malaysia's main difference arose from the forceful reaction of the political leadership to the crisis. He chronicles how

Prime Minister Dr. Mahathir bin Mohamad took an attitude that was strongly anti-IMF and anti-capital markets in the period following the crisis, blaming speculators for his country's troubles. This anti-international financial markets rhetoric intensified in late 1998 when Deputy Prime Minister Anwar was ousted. According to Dornbusch—and in this he agrees with Kaplan and Rodrik—the main difficulty in evaluating Malaysia's performance is that its economic recovery coincided with a general improvement in world economic conditions, including major interest rates cuts by the Federal Reserve.

Dornbusch argues that a serious comparative evaluation of Malaysia's capital controls program requires an understanding of the initial conditions, and in particular of whether at the outset of the crisis Malaysia was more "vulnerable" than the rest of the East Asian economies. In his view, the most important vulnerability factors include misaligned exchange rates, nonperforming loans in the banking sector, and risk in the national balance sheet due to excess short-term debt. Dornbusch's analysis of vulnerability factors suggests that Malaysia's initial conditions were not worse than those of the other East Asian countries. In fact, he argues that, for a number of the key indicators, Malaysia appears to have been on a better footing than the rest of the region. This was the case, for instance, for the debt-equity ratio and for the ratio of short-term external debt to international reserves. The second question addressed by Dornbusch is whether Malaysia's recovery in 1999–2000 can be attributed to the capital controls adjustment program of September 1998. He argues that, although it is indeed tempting to think that the controls were behind the recovery, it is also possible to argue that improving conditions were solely the result of better external conditions. According to Dornbusch, when Malaysia's indicators began to improve, "markets had already settled in Asia and interest rates had started to decline—and would soon do so everywhere under the impact of Federal Reserve rate cuts and a reduction in jitters."

#### **Part IV: Balance Sheet and "Crony Capitalism"**

Early studies on currency crises focused almost exclusively on the role of flows, including the way in which imports and exports react to a real exchange rate devaluation. In the 1980s, however, it became increasingly apparent that in a world with increased capital mobility, currency crises have very important balance sheet effects. In particular, if the corporate sector has significant liabilities expressed in foreign currency, a devaluation can generate massive bankruptcies. As the corporate sector has difficulties paying its debts, local banks' nonperforming loans will mount. This process is usually compounded by the fact that during the expansive phase of the cycle many banks engage in questionable practices. They lend to friends and "cronies" and tend to inflate the value of collateral. Once the tide changes and the economy slows down, banks are slow to write off bad loans and re-

luctant to make provisions. As the experiences of Mexico, Indonesia, and other crisis countries have shown, banks' difficulties can grow quickly and become very costly to clean up. Ultimately, both the corporate and the banking sectors must be restructured. In many cases—Mexico is probably the best known—a number of banks go under and must be bailed out by the authorities. Taxpayers, unavoidably, end up footing the bill. The cost of these currency-cum-banking crises can be enormous, surpassing in some cases 20 percent of the country's GDP. The six papers collected in this part of this volume address different aspects of balance sheet effects, including the role they played in the Korean crisis, the way they interact with corruption, and their implications in designing optimal exchange rate policies.

In "Negative Alchemy? Corruption, Composition of Capital Inflows, and Currency Crises," Shang-Jin Wei and Yi Wu analyze the effects of corruption and lack of transparency on capital flows composition. Their point of departure is the finding by Frankel and Rose (1996) that the composition of capital flows is an important determinant of the probability of a country's facing a crisis. According to these results, countries whose capital inflows are tilted toward FDI have a lower probability of a currency crisis. Wei and Wu develop a model in which the composition of capital inflows may be affected by the degree of corruption in the host country. In their setup, a higher degree of corruption results in a lower percentage of FDI relative to overall capital inflows, because the need to pay bribes tends to increase with the frequency with which foreign investors interact with local officials. The fact that portfolio and bank creditors are more likely to be bailed out in cases of crisis also affects the composition of capital flows: Banks and portfolio creditors will be more willing to do business with corrupt countries.

In their empirical analysis, Wei and Wu use a large data set on bilateral capital flows and a series of alternative indexes on corruption. They estimate a number of panel regressions using information for 1994–96. Their results indicate that corruption and lack of transparency indeed affect the composition of capital flows. Countries that are perceived as being more corrupt tend to receive relatively less FDI and a relatively higher proportion of bank loans. These findings hold for different specifications of the capital flows equations and are robust to the estimation technique as well as to the controls included in the regressions. Wei and Wu argue that to the extent that a lower reliability in FDI increases the probability of a crisis, reducing corruption represents an important crisis prevention mechanism.

The chapter by Robert Dekle and Kenneth Kletzer, "Domestic Bank Regulation and Financial Crises: Theory and Empirical Evidence from East Asia," as do the other chapters in this part of the book, deals with the banking relationships that have been implicated in the Asian financial system due to the problems of moral hazard.

If crises of the 1970s and 1980s were represented by the first-generation approach, and if the 1992–93 exchange rate mechanism (ERM) crises in-

spired the second-generation models, then the East Asian crises of 1997–98 provided motivation for the third-generation models. As previously noted, in the latter third of the twentieth century East Asia earned a relatively good reputation for fiscal discipline and monetary stability. It was difficult to attribute crises here to the traditional culprit of excessive macroeconomic expansion. The third-generation approach instead interprets recent crises as illustrations of the perils of moral hazard. Borrowers and lenders are less likely to be careful in evaluating the true profitability of investment opportunities if they believe they will be bailed out in the event that the project goes awry.

The third-generation model starts from the assumption that government officials have a pool of resources that can potentially be used to bail out political cronies if they get into financial difficulty.<sup>6</sup> This pool is mainly identified with the central banks' holdings of foreign exchange reserves. Well-connected banks are able to borrow from abroad to finance risky projects, such as real estate development or a new factory in the already glutted steel industry. They are aware of the risk, but they believe that they will be bailed out by the government if things go badly. In the worst countries, loan guarantees have been explicitly promised. In other cases, the government may have tried to declare in advance that it will not be responsible for private debts, but this disclaimer is not believed.<sup>7</sup>

Why does the crisis occur when it does? Asian countries did not suddenly develop critical structural flaws in their financial systems for the first time in 1997. The timing of the attack again arises from the calculations of speculators who fear that if they wait too long there will not be enough foreign exchange reserves to go around. However, there is a key difference from the first-generation models, which watched reserves decline steadily over time and identified the timing of the attack as the point at which reserves sank to a particular critical level. The third-generation models watch liabilities rise steadily over time, artificially encouraged by moral hazard. They identify the timing of the attack with the point at which the liabilities have climbed to the critical level, given by the level of reserves. At that point, speculators suddenly cash in their investments. If they waited any longer, they might not be able to get their money out. The speculative attack, as usual, then forces the central bank to abandon the exchange rate.

Dekle and Kletzer develop a variant of this approach. The banking system becomes progressively more fragile in the presence of public loan guarantees and poor regulation, until the inevitable crisis occurs in which capi-

6. Two key references are Michael Dooley (2000) and Paul Krugman (1998).

7. Carlos Diaz-Alejandro (1985). A “no bailout” declaration lacks credibility particularly in the case of domestic banks. When the crisis comes, the pressure for the government to rescue insolvent banks will be irresistible for two reasons. First, most depositors are small savers, not sophisticated investors; and second, bank failures can have a devastating effect on the rest of the economy, particularly because banks constitute the payments system.

tal flows reverse. The model generates a rise in capital flows and bank debt relative to GDP an accompanying fall in the value of banks relative to corporations before the crisis, and a recession when the crisis hits. A consideration of five individual East Asian cases produces the conclusion that the model's assumptions fit the circumstances fairly well in Korea and Thailand, where crises occurred, but less so in Malaysia, and not at all in Singapore and Taiwan, where a crisis did not occur.

The chapter by Luis Felipe Céspedes, Roberto Chang, and Andrés Velasco, “Dollarization of Liabilities, Net Worth Effects, and Optimal Monetary Policy,” analyzes optimal exchange rate and monetary policies in emerging countries. More specifically, the authors investigate whether domestic monetary authorities should actively defend their currencies against speculative attacks. They argue that the answer to this question depends, in principle, on whether the corporate sector in the country in question has foreign exchange rate liabilities. Indeed, recent suggestions that emerging countries should give up their national currencies and adopt a major currency as legal tender—the so called dollarization proposal—have been based on the idea that in the presence of dollarized liabilities, currency depreciation can be very costly. In order to confront this issue, the authors develop a formal model with balance sheet effects and staggered labor contracts, and they make formal welfare comparisons regarding the effects of exogenous shocks under alternative exchange rate and monetary policy regimes. The comparison is centered on two possible regimes: a credible fixed exchange rate and a discretionary flexible exchange rate. In this model, domestic output is produced by heterogeneous workers, investment is partially financed with foreign loans, and foreign borrowing is subject to information asymmetries and agency costs. This, in turn, means that the economy may be subject to balance sheet effects.

The authors calibrate their model and use a standard government loss function to compare the effects of alternative policy responses to an external disturbance. They formally analyze several discretionary policies and a fixed exchange rate policy. Their results indicate that, under discretion, the optimal policy response implies a complex combination of interest rate management and exchange rate adjustments. This policy is similar to a flexible inflation-targeting rule with an exchange rate feedback. More importantly for the current debate on appropriate exchange rate regimes, they find that, in terms of social welfare, any of the discretionary policies dominates the fixed exchange rate option. According to the authors, the superiority of flexible (discretionary) exchange rate policy holds independently of the existence of balance sheet effects.

In “*Chaebol* Capitalism and the Currency-Financial Crisis in Korea,” Anne O. Krueger and Jungho Yoo investigate the causes behind the Korean currency-financial crisis of 1997–98. They argue that although the crisis was the result of the interaction of a number of factors, it is important to deter-

mine which were the dominant ones. This exercise is particularly relevant for the design of future prevention policies. Krueger and Yoo begin their analysis by reviewing the evolution of the Korean development policies since the 1960s. They discuss the country's export promotion policies of the early years, the "competitive" real exchange rate policy, and the directed-credit policies. The authors analyze the capital account liberalization policies of the 1990s and argue that there is little *prima facie* evidence that the relaxation of controls on capital mobility was the main cause of the collapse of the won in 1997 and the massive financial crisis that followed.

Krueger and Yoo carefully investigate of the evolution of *chaebol* financial and economic performance during the last decade and a half. They are particularly interested in understanding whether excessive and reckless lending to these conglomerates was a major cause of the crisis. Their main conclusion is that the *chaebol* were in a very weak financial position long before the crisis erupted. Moreover, questionable loans and even outright bad loans were kept in the banks' books, creating a very weak banking structure. Although good overall economic conditions and, in particular, a strong demand for Korea's exports allowed the banks to continue to operate, their vulnerability was constantly growing. During the very good years of 1994 and 1995, the *chaebol* continued to borrow, and the banks continued to lend. Project profitability was low, however, and *chaebol* dangerously increased their level of indebtedness. When the good times came to an end in 1997, the *chaebol* needed even more funds, but at that time banks were unable to provide them. The increase in interest rates in 1997 could not be tolerated by the *chaebol*, and their financial weakness became increasingly apparent. According to Krueger and Yoo, the exchange rate crisis did not generate the financial and banking crisis; rather, higher interest rates did. They further argue that the depreciation of the won had a relatively small effect on banks' balance sheets. In fact, since *chaebol* are major exporters, a (real) depreciation would tend to improve their financial prospects and thus would have an indirect effect on their creditor banks.

In "Living with the Fear of Floating: An Optimal Policy Perspective," Amartya Lahiri and Carlos A. Végh discuss policies aimed at defending a currency under attack. During the East Asian crisis, the IMF standard policy of raising interest rates was severely criticized by a number of analysts. A number of economists, including some World Bank senior officials, argued that this interest rate policy was inadequate; according to the critics, higher interest rates introduce overly recessionary forces, without being particularly effective in fending off the attack on the currency. In this paper, Lahiri and Vegh build a model to formally analyze the optimal central bank response to a speculative attack. The model considers a small country that produces two tradable goods; nominal wages are subject to rigidities, and some firms are subject to a "credit in advance" constraint—that is, they require bank loans in order to have positive output. In this model, interest



rate shocks, which are associated with money demand shocks, have two effects. On the one hand, they increase the cost of credit and result in lower output, and on the other hand, they result in higher bank deposits.

Lahiri and Vegh use their model to compute the monetary authorities' optimal reaction to a demand for money shock. The menu of options is limited to either a one-shot intervention in the foreign exchange market or a change in government bonds' interest rates. The authors show that in their model the existence of nominal wage rigidities implies that it is optimal to maintain the exchange rate unchanged. That is, in this setting, fixed nominal exchange rates will be preferred even in the face of large shifts in the demand for money. They show that the optimal response implies combining an interest rate change with intervention in the foreign exchange market by selling (or buying) international reserves. The authors argue that if there are (social) costs of altering the existing stock of international reserves, the optimal response to a shock may include the adoption of a dirty floating exchange rate regime.

Aaron Tornell's chapter, "Policy in an Economy with Balance Sheet Effects," investigates policy responses to crisis in the presence of enforceability problems, bailout problems, and balance sheet effects. Tornell argues that many recent crises have taken place in countries that were particularly vulnerable to external shocks. According to him, these vulnerable economic national structures were the result of neither bad policies nor corruption; rather, they were deliberate, second-best policies aimed at achieving very fast economic growth. Many recent crises, Tornell argues, were the result of bad luck, rather than of bad policies. In order to illustrate this point he discusses in some detail the most important features of the Mexican peso crisis of December 1994.

Tornell's model assumes an economy that produces tradable and non-tradable goods and is subject to two main distortions. First, enforceability problems limit the amount of debt that producers can issue. This reduces borrowing, investment, and growth. Second, there are (implicit) bailout guarantees, which help relax the borrowing constraint. In this setting the country can follow either a risky or a safe equilibrium path. The interaction of the enforceability and bailouts distortions results in a fragile economy that may be subject to self-fulfilling crises.

Tornell argues that within this particular framework, many of the traditional crisis prevention policies are misguided. For example, he argues that outlawing bailouts would reduce borrowing, investment, and growth under every state of nature. Likewise, he argues that forbidding dollar-denominated debt would also reduce a country's (expected) growth. Tornell is careful to point out that his analysis does not imply that bailouts should be generalized and very large, nor that banks should be encouraged to hold huge dollar-denominated portfolios. It does mean, however, that the outright prohibition of these policies is likely to be, *ex ante*, welfare reducing.

An important implication of Tornell's model is that prudential regulation should be improved. In terms of postcrisis policies, Tornell makes two points: First, in order to reduce the output cost of crises, bailouts should not be restricted to lenders; some bailouts should be granted to borrowers. Second, bailouts should be granted at once and not in a piecemeal fashion. He also argues that appropriate exchange rate and interest rate response after a crisis is country-specific, and no generalizations can be made.

## Part V: Conclusion

In the closing chapter, "A Primer on Emerging-Market Crises," Rudi Dornbusch provides an overview of the most important features of recent financial and currency crises in emerging countries. He begins with the distinction between the old-style crises with macroeconomic origins—over-expansion and overvaluation—and the new-style crises, in which capital flows exhibit "sudden stops" (Calvo 1998).

A key question for the models is why the attacks occur when they do. The answer from the first-generation models is that attacks occur when reserves decline to a level at which investors realize that if they wait any longer to trade in their domestic currency for foreign, there won't be enough to go around. The answer from the third-generation models is that attacks occur when the level of liabilities that have a claim on bailout protection rises to the level of reserves available for the bailing-out. The second-generation models intentionally leave the timing somewhat indeterminate.

The other key questions on which the Dornbusch review focuses include the following: What makes countries vulnerable? Why are the economic costs so large once a crisis does occur? And what are the appropriate remedies? Balance sheet effects are central in answering these questions. A country is vulnerable when its liabilities are shorter term than its assets and are dollar denominated rather than domestic denominated. In the event of a currency crisis, banks and firms will have trouble servicing their debts out of their domestic revenues and may go bankrupt. Investors are aware of this problem, which means that countries with bad balance sheets are vulnerable to speculative attacks precipitated even by small events. Consequently, Dornbusch offers the aphorism "good balance sheets, no crisis."

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## **The Current Account and Vulnerability to Crisis**

