WP/00/114

IMF Working Paper

The Corporate Sector Dynamics of Systemic Financial Crises

Mark R. Stone

INTERNATIONAL MONETARY FUND

WP/00/114

IMF Working Paper

Monetary and Exchange Affairs Department

The Corporate Sector Dynamics of Systemic Financial Crises

Prepared by Mark R. Stone[1]

Authorized for distribution by Piero Ugolini

June 2000

Abstract

This paper puts together a set of stylized facts of the corporate sector dynamics of systemic financial crises based on recent crisis episodes with a view to identifying the key issues and their policy implications. The evidence suggests that corporate crisis dynamics are triggered by a cutoff of capital inflows and are amplified into an historically severe recession by exchange rate depreciation, high interest rates, and current account adjustment. The adverse consequences of these dynamics can be forestalled and assuaged by policies that improve monitoring of the corporate sector and boost nonbank sources of corporate financing.

JEL Classification Numbers: E44, F32, G30

Keywords: Financial crises, corporate restructuring

Author's E-Mail Address: MStone@imf.org

---

[1] This paper benefited from the comments of Ales Bulir, Karl Driessen, Ed Frydl, Ferenc Karvalits, Susan Schadler, Inwon Song, Amadou Sy, Masahiko Takeda, Piero Ugolini, Lisbeth Zacho, and participants at a seminar at the Korea Institute for International Economic Policy.

Contents Page

I. Introduction

Corporate sector dynamics have moved to the center stage of systemic financial crises in recent years. The most dramatic example is the East Asia crisis, which is being increasingly attributed to corporate balance sheet problems (Krugman, 1999b). This new leading role for corporate crisis dynamics is posing novel and difficult challenges to policymakers. For example, corporate balance sheets weakened by crisis limited the ability of central banks to stabilize exchange rates in East Asia during 1998 (cf. Roubini, et al., 1998). Another important policy challenge is large-scale post-crisis corporate restructuring, which is always more complex and prolonged than expected, and seems to be a regular feature of recent systemic crises (Stone, 2000).

The novelty and difficulty of these policy challenges suggest that the corporate sector warrants special attention in the consideration of systemic financial crises. A systemic crisis can be defined generally as "a severe disruption to financial markets that by impairing their ability to function has large and adverse effects on the real sector" (IMF, 1998).[2] Systemic crises have been seen as driven by mutually reinforcing disruptions to exchange rate and bank markets (cf. Kaminsky and Reinhart, 1999; IMF, 1998; Mishkin, 1997), and, therefore, the corporate sector has received very little attention. Recently, however, high levels of short-term and unhedged corporate borrowing from domestic banks and volatile international capital markets have boosted the importance of corporate dynamics in systemic crises. Corporate sector crisis dynamics, according to the evidence presented below, are marked by:

(i) a high level of corporate sector leverage;

(ii) an historically severe investment-led recession;

(iii) strong corporate sector balance sheet policy channels; and,

(iv) large-scale corporate sector restructuring led by the government.

This paper is based on the premise that a better understanding of corporate crisis sector dynamics could help policymakers prevent and mitigate systemic financial crises.

To this end, a set of stylized facts on corporate sector dynamics in systemic crises is put together in this paper with a view to identifying the key issues and their policy implications. The remarkable shortfall of data for the corporate sectors of countries prone to systemic crises precludes undertaking of the more ambitious—and much needed—task of developing a broad analytical framework founded on theory and empirics. This paper, rather, assembles data from a variety of sources to construct stylized facts that could be used to

[2] Nonsystemic financial crises are limited to the financial (usually banking) sector itself (e.g., the U.S. savings and loan crisis in the 1980s) or to currency markets (the ERM crisis of 1992–93) and need not give rise to corporate sector crisis dynamics.

formulate such a framework. In addition, these facts may serve to inform ongoing policy decision making on corporate crisis issues.

Two main policy messages emerge from this paper. First, improved reporting of corporate sector data could forestall and assuage systemic crises. The dearth of reliable corporate data for countries that are prone to crisis makes it difficult or impossible to identify corporate sector vulnerability, limits the effectiveness of policy once crisis hits, and slows corporate restructuring thereafter. Corporate sector data collection and reporting should be accelerated, and the tools used to analyze these data refined. Second, policies that increase nonbank sources of corporate financing such as equity, commercial paper and bond markets can reduce crisis vulnerability and severity. These markets can be developed by enhancing financial infrastructure through policies directed at accounting standards, judicial and legal systems, and other institutional nuts and bolts. This paper also offers some recommendations concerning crisis prevention, policy responses during a crisis, and the modalities of corporate restructuring.

Historically, the linkages between corporate sector leverage and the macroeconomy were relatively weak, and most of the literature has addressed non-crisis issues. Fisher (1933) used a buildup of corporate debt as a key ingredient in his explanation of business cycles. More recently, the "financial accelerator" literature has shown how highly indebted corporations can amplify the impact of changes in interest rates (Bernanke et al., 1998). The role of corporate sector balance sheet crisis dynamics in an open economy context have been modeled in several normative analyses of the Asian crisis (Natalucci, 1999 and Krugman, 1999b). The relatively few empirical cross-country analyses which have addressed the role of the corporate sector in systemic financial crises have mainly concerned the transition countries (World Bank, 1996) and East Asia (Lane et al., 1999 and World Bank, 1999).

This paper draws on evidence collected from nine systemic financial crisis episodes wherein the corporate sector played a key role according to the above four criteria (Table 1). Hungary and Poland are different from the others in that their crises marked the inevitable end of their legacies of central planning, as opposed to excessive leverage and a sudden and unexpected financial crisis. Thus, they are not included in the discussion of the buildup to crisis. However, comparison of their macroeconomic adjustment to crisis with that of the other countries seems useful, and they offer important lessons regarding restructuring policies. This group of episodes is not meant to be comprehensive and excludes especially problematic cases involving a large number of adverse and concurrent factors that render analysis less illumining (e.g., Romania and Russia in the early 1990s), and does not encompass small countries. Rather, these nine episodes seem to be particularly important, and data and documentation on them are more readily available. The dating of the rise and decline of corporate crisis dynamics in this paper is centered on the trough month of industrial production during the crisis because this seems to be the most sensible and widely available measure of the impact of the corporate sector on the economy at large.

Table 1. Selected Systemic Crisis Episodes
with Important Corporate Sector Dynamics

Country	Trough	Country	Trough
Chile	January, 1983	Indonesia	May, 1998
Mexico	October, 1983	Korea	July, 1998
Hungary	July, 1992	Malaysia	November, 1998
Poland	November, 1991	Thailand	November, 1998
Mexico	July, 1995		

1/ Trough month is that of the lowest value of the level of seasonally adjusted industrial production during the crisis episode.

The evolution of linkages and policy challenges that arise during the course of a crisis episode lead naturally to their division into three phases:

1. During the **vulnerability** phase the susceptibility of the economy to a sudden cutoff of credit is intensified by interventionist government policies and poor governance that compel heavy corporate borrowing from domestic banks.

2. The **contraction** phase is triggered by an abrupt stop in capital inflows combined with a sudden downward shift in expectations, and followed by an historically severe recession, which is either the direct result of, or is amplified by, the links between overleveraged corporate sector balance sheets and aggregate economic activity.

3. During the **recovery** phase the economy rebounds and the government takes on a larger role in the economy with the aim of bringing about the restructuring of the corporate sector.

The linkages and policies that arise in each of the above three phases are examined in Sections II, III and IV, and Section V concludes.

II. Vulnerability Phase

Vulnerability to the emergence of corporate sector crisis dynamics is rooted in interventionist government policies aimed at accelerating development and growth. These policies concentrate corporate lending in selected creditors and borrowers. While these policies may be successful at the outset, they ultimately result in excessively leveraged corporate balance sheets and undiversified creditor portfolios vulnerable to shocks. The buildup of vulnerability and crisis prevention policies are considered here in turn.

A. Vulnerability Buildup

Interventionist government policies set the stage for the buildup of vulnerability. To promote growth, especially at early stages of development, governments often direct credit toward and allow a high degree of concentration in favored sectors. These policies can be enacted overtly, for example, by ordering banks to dispense loans to particular sectors, or indirectly through incentives such as tax breaks and subsidies (Borensztein and Lee, 1999). Such policies can enhance growth during early stages of development, but "exiting" from these policies in a manner that does not foster vulnerability seems to be especially difficult, as shown by the experience of East Asia (World Bank, 1999 and Pyo, 1999).

Liberalization of domestic banking combined with weak supervision can boost the quantity but undermine the quality of bank lending to the corporate sector (Dooley, 1997 and Krugman, 1999a). Of course, bank lending can enhance growth by financing higher levels of corporate investment. However, liberalization combined with lax bank supervision or implicit or explicit deposit guarantees can also ratchet up the riskiness of bank loan portfolios. This combination does seem to be an important factor contributing to the vulnerability of the corporate sectors in East Asia (Krugman, 1998). Also, state-owned banks or bank lending directed by governments can result in the misallocation of credit to corporations, which seemed to have been the case in Chile, Mexico, and the transition countries (Velasco, 1987; Lubrano, 1996; Begg, 1996). The level of overall domestic bank credit in developing countries has been on an upward trend since the late 1980s (Figure 1, top panel).

Underdeveloped domestic nonbank capital markets concentrate risk by limiting the number of options for corporate financing. Small or nonexistent corporate bond, commercial paper, and equity markets lead to overreliance on bank financing. The absence of derivative markets prevents corporations from hedging against the risk of exchange rate devaluation. Domestic bank and foreign portfolio financing can finance growth in the good times, but the absence of alternative financing and derivative markets can also result in excessive vulnerability of the economy to a bad shock or bad news regarding the corporate sector.

The limited data on the corporate financial structure of emerging market countries suggest a *correspondence between vulnerability to crisis and bank dominance* of the financial system. Gross financial flows to the corporate sector for the six of the nine crisis episodes that are reported in Kamin et al. (1999) are quite high relative to industrial countries, suggesting countries at their stage of development may be inherently more vulnerable to financing shocks (Table 2). Bank loans account for about half of gross financial flows to three fourths of the corporate sector for the crisis countries, which is higher than for Singapore, the U.S. and the U.K., about the same as for Germany (with its system of bank cross-ownership). In Japan, which has its own slow-burning systemic corporate sector problems, bank loans account for fully three-fourths of corporate financing. In addition, Claessens et al. (2000), concluded that external financing mostly from banking systems is inherent to East Asian corporate sectors.

Table 2. Selected Countries, Gross Flows of Financial Liabilities to the Nonfinancial Corporate Sector, 1992–94

	Composition of Total Gross Flows (In percent)			
	Bank Loans	Commercial Paper and Bonds	Equities	Annual Flow (percent of GDP)
Crisis Countries				
Chile 1/	71.9	2.8	25.3	11.6
Hungary	41.1	1.9	57.0	17.9
Mexico	...	...	...	23.5
Korea	48.8	29.3	21.9	25.4
Malaysia	54.9	26.9	18.2	11.2
Thailand	45.7	32.4	22.0	73.1
Other Countries				
Singapore	31.5	26.8	41.7	3.8
United States	-51.5	133.1	18.4	1.9
Japan	76.3	18.6	5.1	2.5
Germany	56.1	36.1	7.8	7.1
United Kingdom	20.9	17.1	61.9	3.9

Source: Kamin et al., 1999.

1/ For 1982–84.

Volatile capital inflows can increase vulnerability to crisis. Capital inflows have accelerated sharply in recent years (Lopez-Mejia, 1999 and Adams et al., 1998; Figure 1, middle panel). Further, their volatility has increased in line with the shift in external financing from international banks to other private sources (Figure 1, bottom panel). These inflows can go to corporations directly (Indonesia) or indirectly via domestic banks (Mexico in 1995 or Korea). Again, capital inflows toward high (risk-adjusted) rate of return projects is beneficial to investors and corporations alike and can boost economic growth. However, herd behavior on the part of international investors may set the stage for a sudden reversal of capital inflows (Calvo and Mendoza, 1998). These reversals can be especially harmful when external liabilities are mostly of short-term liabilities, as in the case of Korea in 1997 (Lane et al., 1999). Capital inflows rose sharply beginning seven or eight years before the crises in each of the nontransition countries examined here (Figure 2).

Poor corporate governance is the other side of the buildup of vulnerability. Corporate governance practices cover shareholder rights, creditor rights, accounting and disclosure, and ownership and control. Certainly, governance was a problem in countries emerging from a

centrally planned system, either due to direct state control of corporations or to a faulty privatization process (World Bank, 1996). Several studies have concluded that governance in East Asia was poor owing to a high degree of ownership concentration (Claessens et al., 1998b).

Finally, the vulnerability of highly leveraged balance sheets can be further increased by *rigid macroeconomic policies*. In several east Asia countries rigid adherence to a fixed exchange rate raised the price of nontradable goods and assets relative to tradables (World Bank, 1999). The overvalued exchange rate lulled corporations into a false sense of security regarding the costs of external debt servicing, leading to continued external borrowing, and a shift of investment to nontradables and, thereafter, to asset market bubbles. (World Bank, 1999; Lane et al., 1999). In addition, if world interest rates are below domestic interest rates banks have reason to borrow abroad and onlend to domestic corporations, leaving banks with a large open foreign currency position. Domestic bank lending denominated in foreign currency, in contrast, shifts foreign exchange risks to corporations, who have little experience in managing such risk.

B. Prevention Policies

Of course, crisis prevention is the main policy challenge during the vulnerability phase. Historically, the corporate sector has not appeared on the radar screen of national policymakers, but recent crises are giving corporate health the attention it deserves. The best way to prevent crises is to look for signs of vulnerability through careful monitoring of the balance sheets of the corporate and financial sectors.

Traditionally, *aggregate external debt* data have been used as indicators of vulnerability.[3] However, debt data would not have served as reliable crisis indicators for the nine corporate crisis episodes analyzed here. The ratio of total external debt to GDP did rise during the four years prior to seven of these crises, but debt rose through most of the past 25 years for these countries as well (based on data from the IMF's World Economic Outlook database). Monitoring of the share of short-term external debt also would have given numerous false positive signals. These debt data are not reliable leading indicators of corporate sector problems because much of the debt is an obligation of the government, rather than the private sector. The share of total external debt accounted for by private borrowers and not guaranteed by the government does increase ahead of eight of the nine crises and gives fewer false positives, but is still far from reliable.

Stock market indices are another useful indicator of corporate vulnerability. In general, stock market indices (here measured in U.S. dollar terms and normalized by the U.S.

[3] The burgeoning "early warning system" literature that aims at identification of the macroeconomic developments that presage currency and banking crises is reviewed in Berg and Patillo, (1999).

stock market index) fell sharply during the two to three years before the crisis trough (Figure 3). Stock markets bottomed out several months ahead of the trough of industrial production during the 1990s crises with the exception of Mexico. It should be kept in mind that the limited period of data availability makes it difficult to determine with confidence whether or not these declines could have served as signals of crisis. Still, it is clear that policymakers should pay careful attention to the domestic stock market.

Aggregate corporate leverage, which is typically proxied by the debt-equity ratio for the corporate sector is a good summary indicator of corporate vulnerability. Unfortunately, comparable cross-country data on corporate debt are generally not produced by official sources, especially for the middle-income emerging market countries prone to financial crisis. The importance of this data shortfall is worth emphasizing. It may reflect the expense of collecting data on a large number of corporations, as well as confidentiality concerns on the part of corporations themselves. In addition, the need for such data has not been urgent in the past because episodes of extreme corporate distress have been few in number and moderate in scale. However, the shortage of these data hindered the ability of the government to act early to reduce vulnerability to the crises of the 1990s where the corporate sector played a key role. The emerging market corporate leverage data reported in Claessens (1998b; Figure 4) indicate that as of 1996 debt-equity ratios varied from 61 percent for Peru to 355 percent for Korea. Thus, it seems fair to conclude that cross-country differences in corporate leverage are sizable. Moreover, countries with a higher degree of corporate leverage are more likely to experience corporate sector crisis dynamics, judging by the high leverage for the east Asian countries that experienced corporate crises and Mexico.[4] Leverage increased during the mid-1990s in Korea, Malaysia and Thailand (Claessens, et al., 2000).

Detailed data on the composition of corporate debt would improve monitoring of corporate vulnerability. Ideally, governments would be able to regularly monitor not just the overall level of corporate leverage, but also the maturity structure of balance sheets, the share of debt accounted for by nonbank capital markets, and the extent to which balance sheet risks are hedged. Such monitoring could help governments discern when a level of growth financed by a high degree of corporate leverage is at risk of being unsustainable. The development of complete and timely macroeconomic flow of funds data is an important and practical step that could be taken in this direction.

Corporate balance sheet data can be fed into *analytical tools of aggregate corporate risk*. Corporate profit simulations, which measure the impact on current profits of changes in

---

[4] Also interesting are the countries in east Asia and Latin America with high leverage that avoided the crisis: in the Philippines corporations enjoyed relatively high rates of return (Claessens et al, 1998) and the economy may have been less vulnerable due to relatively weak linkages with the region (Roubini et al, 1998); Singaporean and Brazilian corporations reportedly have relatively low external and short-term debt.

domestic and foreign interest rates and the exchange rate are a practical tool. Simulations of the impact of changes in interest rates and exchange rates on corporate cash flow for east Asian countries in Claessens et al. (1999) indicates which countries were more vulnerable. The estimated equity value (EEV) framework has been used for many years for analysis of individual corporations, and is now being applied to the aggregate corporate sector. The EEV framework links corporate balance sheets and macroeconomic policy in a way that accounts not just for the current period, but also for future periods (Gray, 1999). Currently, very few countries systematically assess corporate risk. The Bank of England, which utilizes yield spreads, equity prices, and profitability to assess corporate risk, is a notable exception.

Governments also can reduce corporate vulnerability by *increasing the share of corporate financing provided by nonbank capital markets* through measures to enhance financial market infrastructure. The extension of corporate financing from banks, which usually dominate in early stages of development, to nonbank intermediaries reduces corporate sector vulnerability by extending trading to a wider class of borrowers and improving risk bearing. The development of nonbank capital markets is accelerated by government policies that build financial infrastructure such as accounting standards, judicial and legal systems, and other institutional nuts and bolts such as clearing, settlements and payment systems (Caprio et at., 1994). In addition, the removal of impediments, such as regulations that restrict the development of derivative markets, can increase the role of nonbank capital markets.

III. Contraction Phase

The contraction phase is marked by a severe recession triggered by a cutoff of capital inflows following an external shock or an adverse shift in expectations regarding a vulnerable corporate sector. The capital inflow cutoff leads to a sharp fall in the exchange rate. The depreciation is amplified into a systemic crisis encompassing banks and the real sector via corporate sector balance sheet channels. Formulation of expansionary monetary and fiscal policies in this setting is complicated by the lack of reliable balance sheet data, which often leads to underestimation of the contractionary impulse. Monetary policy can be further complicated by the conflicting goals of limiting the recession and stabilizing the exchange rate.

A. Crisis Dynamics

The trigger

Corporate crisis dynamics are usually triggered by a *sudden reversal of capital inflows* related to external events or a downward shift in the expected performance of the economy (Table 3). The magnitude of these reversals in recent years reflects not only the increase in capital inflows during the 1990s, but also their concentration in the private sector of a relatively small number of countries and short-term maturities. The exceptions to this pattern for the nine countries studied here are Hungary and Poland, as these crises followed from their history of central planning. The sudden reversal of inflows can be sparked by a

worsening of domestic prospects, or by external events such as an increase in world interest rates or developments in other emerging markets.

Table 3. Crisis Episodes, Net Private Capital Flows

(Percent of GDP)

	Chile 1983	Mexico 1983	Poland 1991	Hungary 1992	Mexico 1995	Indonesia 1998	Malaysia 1998	Thailand 1998
t-3	11.7	5.3	8.4	2.5	6.8	6.2	6.4	12.9
t-2	14.6	9.5	-2.2	-3.5	7.6	6.3	6.7	5.7
t-1	4.5	0.0	4.8	-0.4	3.1	1.4	5.0	-7.9
t	**1.8**	**-8.2**	**-2.6**	**1.4**	**-3.9**	**-3.1**	**-4.3**	**-14.2**
t+1	9.6	-3.4	-2.1	14.7	5.1	-3.4	-0.5	-8.5
t+2	5.0	-2.2	-2.3	7.1	6.5	...	...	...
t+3	0.8	-0.6	0.6	16.0	4.6	...	...	...
Year t less average for t-2 and t-3	-11.3	-15.6	-5.7	1.9	-11.1	-9.3	-10.8	-23.5

1/ Excluding reserves; comparable data for Korea are not available. Year t is the year of the trough of industrial production during the crisis episode.

Source: IMF WEO database, August, 1999.

Table 4. Crisis Episodes, Real Domestic Credit Before and After a Crisis

(Percent differences)

	Chile 83M1	Mexico 83M11	Hungary 92M7	Mexico 95M7	Indonesia 98M5	Korea 98M8	Malaysia 98M11	Thailand 98M11
Credit at trough month Less pre-crisis average	14.0	-46.1	-23.9	-9.5	10.0	5.1	2.0	-6.7
Post-crisis trough to pre-crisis peak Percent change	-12.9	-52.1	-48.4	-55.5	-66.6	-0.3	-8.0	-15.8

Source: International Financial Statistics.

The evidence for *domestic credit as the trigger is mixed* (Table 4). Sharp drops in domestic credit preceded the crises of Mexico in the early 1980s and Hungary, in contrast to the Chilean crisis. In East Asia the credit cycle did indeed turn downward prior to the crises, but the magnitude and timing of the declines seem to imply that domestic credit shocks on their own did not initiate the corporate crisis dynamics, and, rather, may have followed the onset of the crisis.

The contraction

A key premise of this paper is that corporate crisis dynamics are associated with *contractions of GDP more severe than the usual cyclical downturns*. The real GDP changes for the nine episodes examined in this paper, measured as the sum of negative consecutive real annual GDP growth percent changes during the crisis episodes, averaged a severe drop of -6.1 percent. This compares with an average annual change of –3½ percent for the non-corporate crisis negative growth years, or -1 percent excluding the sharp early 1980s contraction of Poland. The magnitude of the contractions for the east Asian countries is broadly comparable to those of the earlier crisis episodes, taking into account the favorable external environment that benefited Mexico in 1995 (Roubini et al., 1998). Although the severity of these downturns reflects many factors not directly related to the corporate sector, such as banking sector problems, external shocks and rigid macroeconomic policies, the evidence presented below suggests the corporate sector plays a key role.

Industrial production also contracts sharply during a corporate crisis relative to the historical experience (Table 5, Figure 5). These declines are also very large based on the trough value compared to the pre-crisis average. During those episodes industrial production quickly dropped to levels well below trend. Indeed, shortfall of the level of industrial production from its trend is equivalent to several standard deviations for most of the episodes. Moreover, these shortfalls are in most cases the largest over the period of data availability. In some cases, the extent and timing of the downturn reflected the rapid tightening of corporate balance sheet constraints by reform, as was the case in Hungary following the introduction of a tough bankruptcy law (Cottarelli et al., 1999).

Comparison of the crises over time indicates that *the speed of the contraction in industrial production may be accelerating*. The number of months between the pre-crisis peak of industrial production and its crisis trough fell from around 20 months during the crises of the early 1980s and 1990s to 13 months for Mexico in 1995 and further to 12 months on average for the east Asian countries (Table 5). This decline suggests that the speed of the transmission of the triggering shock to output has picked up over the past two decades possibly reflecting higher levels of unbalanced corporate leverage and capital and goods market integration.

Table 5. Crisis Episodes, Industrial Production Before and After a Crisis 1/

	Chile 83M1	Mexico 83M11	Poland 91M11	Hungary 92M7	Mexico 95M7	Indonesia 98M5	Korea 98M8	Malaysia 98M11	Thailand 98M11
Industrial production, actual less trend 2/									
Trough month	-9.0	-6.6	-15.8	-13.4	-13.4	-17.4	-15.0	-13.0	-6.7
Standard deviation	3.7	3.6	8.2	7.7	3.6	4.3	3.4	3.1	7.7
Historical minimum	-9.6	-13.4	-13.4	-15.5	-13.4	-17.4	-15.0	-13.2	-15.5
Level of industrial production									
Number of months between pre-crisis peak and crisis trough	22	19	23	21	13	6	9	15	17
Number of months to restore pre-crisis peak	64	85	NA	80	26	22	17	29	29

Source: IFS and country sources.

1/ Data end in 1999 except for Poland (1995), and begin in 1975 except for Poland (1985), Hungary (1986), and Thailand (1995).

2/ Seasonally adjusted industrial production index less Hodrick-Prescott trend (smoothing parameter of 70,000).

The large contractions in economic activity correspond with *sharp declines in investment* (Table 6). Indeed, in six of the nine cases, the decline in aggregate real investment exceeded the overall GDP contraction. These investment declines were the largest over the period of data availability (generally 1975–99) for each of the nine countries examined here. The dominance of the investment declines, as opposed to the other components of demand, suggests that corporate distress played the key role in these large contractions. Moreover, the negative contribution of investment to growth is increasing over time (Table 6 and Figure 6).

Table 6. Crisis Episodes, Real GDP and Investment Growth

	Mexico, 1983			Chile, 1983			Hungary, 1991		
	Real GDP growth	Investment growth	Investment con to GDP growth	Real GDP growth	Investment growth	Investment con to GDP growth	Real GDP growth	Investment growth	Investment con to GDP growth
t-3	9.2	NA	NA	8.3	29.1	4.2	-0.1	-0.8	-0.2
t-2	8.8	14.7	4.1	7.8	31.2	5.3	0.7	1.6	0.3
t-1	-0.1	-24.5	-7.2	6.7	18.5	3.9	-3.5	-4.5	-0.9
t	**-4.2**	**-27.5**	**-6.1**	**-13.4**	**-40.8**	**-9.4**	**-11.9**	**-20.2**	**-4.1**
t+1	3.6	6.1	1.0	-3.5	-16.5	-2.6	-3.1	-16.4	-3.0
t+2	2.6	11.9	2.1	6.1	26.1	3.6	-0.6	24.4	3.9
t+3	-3.7	-25.0	-4.7	3.5	18.5	3.0	2.9	18.7	3.7

	Poland, 1991			Mexico, 1995			Indonesia, 1998		
	Real GDP growth	Investment growth	Investment con to GDP growth	Real GDP growth	Investment growth	Investment con to GDP growth	Real GDP Growth	Investment growth	Investment con to GDP growth
t-3	3.3	5.7	1.3	3.6	13.3	2.6	8.2	13.1	4.2
t-2	3.8	-2.2	-0.5	2.0	-0.8	-0.2	8.0	8.8	2.9
t-1	-7.2	-10.3	-2.2	4.4	10.3	2.2	4.7	8.5	2.9
t	**-7.0**	**-20.1**	**-4.2**	**-6.2**	**-34.8**	**-7.7**	**-13.7**	**-48.9**	**-17.0**
t+1	2.6	-13.0	-2.3	5.2	25.7	4.0	-0.8	-7.3	-1.5
t+2	3.8	12.8	1.9	7.0	17.6	3.2	NA	NA	NA
t+3	5.2	9.1	1.5	4.6	15.1	3.1	NA	NA	NA

	Korea, 1998			Malaysia, 1998			Thailand, 1998		
	Real GDP growth	Investment growth	Investment con to GDP growth	Real GDP growth	Investment growth	Investment con to GDP growth	Real GDP Growth	Investment growth	Investment con to GDP growth
t-3	8.9	11.4	4.1	9.4	20.4	8.7	8.8	12.3	5.1
t-2	6.8	8.7	3.2	8.6	5.9	2.8	5.5	5.4	2.3
t-1	5.0	-7.5	-2.8	7.7	10.2	4.7	-1.3	-19.7	-8.4
t	**-5.8**	**-38.6**	**-12.9**	**-6.7**	**-44.4**	**-20.7**	**-9.4**	**-41.0**	**-14.3**
t+1	6.5	24.7	5.4	2.4	10.2	2.8	4.0	15.0	3.4
t+2	NA	NA	NA	NA	NA	NA	NA	NA	NA
t+3	NA	NA	NA	NA	NA	NA	NA	NA	NA

Source: World Economic Outlook database as of August 1999; projections for 1999.

Further evidence on the links between recession and corporate leverage is provided by descriptive cross-section regressions of 1998 growth for twenty-one emerging market countries. These regressions may provide some insight into understanding why only a few countries experienced severe recessions, even though all were hit by a cutoff of capital inflows.[5] To understand this disparity, growth for 1998 for 21 countries were regressed on variables commonly cited as explanations for the Asian crisis (Table 7).[6] The dependent variable is the difference between real growth in 1998 and trend growth during 1987–96. The independent variables predate the output contraction (except for the capital inflow and real interest rate measures) and therefore could be considered exogenous.

The results suggest that it was those *countries with high levels of corporate debt that were hardest hit*: the corporate leverage parameter estimates consistently have the highest t-statistics and omission of leverage greatly worsens the fit. The capital inflow measure seems to have little explanatory power itself, suggesting it is not the degree of the credit cutoff that explains the differential output contractions per se. Openness is also negatively correlated with output adjustment. While these regression results are based on a small sample, the results are suggestive and indicate that more cross-country analysis of corporate leverage would provide a basis for crisis prevention policies.

The channels

The contractionary impulse of a cutoff of capital inflows is amplified into a systemic crisis largely by corporate sector balance sheet channels. Initially, the shock is localized in the foreign exchange market, but it is then transmitted to the real sector, and, thereafter, passed on to banks through nonperforming loans. Decapitalized banks curtail their lending, exacerbating the downturn.

Rapid exchange rate depreciation can quickly and onerously increase the foreign debt servicing costs of heavily indebted and unhedged firms (particularly for net importers) and can even threaten their viability, especially if exchange rates overshoot. For the nine crisis

---

[5] A panel regression that would provide more general inference regarding corporate leverage is precluded by a lack of data. The advantage of the small sample cross-section approach employed here is that the results are less prone to within-sample structural variance, and it essentially conditions on a single global shock (Berg and Patillo, 1999).

[6] The most important of the overlapping and mutually reinforcing explanations for the crisis found in the literature and thier implications for output are: common external shocks; spillover; tight monetary and fiscal policies (Sachs and Radelet, 1998); loose monetary policy, domestic bank overlending (stressed by Corsetti et al., 1998, Krugman, 1998 and Dooley, 1997); political risks (cf. Roubini et al., 1998); and excessive corporate leverage (emphasized in Krugman, 1999a and 1999b and Kim and Stone (1999).

Table 7. Emerging Market Countries, 1998 Output Adjustment Regression Results

(Dependent variable: Real growth, 1998, deviation from 1987–96 trend)

	(1)	(2)	(3)	(4)	(5)
Corporate leverage, log, 1996	-0.0418	-0.0565		-0.0477	-0.0474
	(2.84)	(3.24)		(2.50)	(3.24)
Capital inflows, 1998/97, annual per change	-0.0109		0.0601	0.0269	
	(0.26)		(0.88)	(0.70)	
Real interest rate, 1998Q3, forward	0.177				
	(1.37)				
Openness, log, trade flows/GDP	-4.12	-3.99	-4.31		-3.38
	(2.13)	(3.18)	(1.91)		(3.18)
Current account balance, 1994–96	0.0416				
	(0.21)				
Nonperforming loan share of total, 1996	-0.0631				
	(0.18)				
Political risk, December 1997	0.099		0.151		
	(0.14)		(0.32)		
Real apprec., Dec. 1996 over 1988–90 average	-0.0645		-0.0497	-0.0663	
	(1.58)		(2.21)	(1.64)	
Real int. rate, 1997Q4–1998Q3, backward		0.188		0.221	0.189
		(2.13)		(5.06)	(2.12)
Constant	14.8	19.0	14.1	1.77	13.4
	(1.27)	(3.48)	(3.45)	(0.70)	(3.48)
R2	0.69	0.57	0.36	0.62	0.69
Adjusted R2	0.48	0.49	0.20	0.52	0.63
F-statistic	3.33	7.46	2.23	6.39	12.36
Number of observations	21	21	21	21	21

1/ Hong Kong SAR, Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan POC, Thailand, Argentina, Brazil, Chile, Colombia, Mexico, Peru, Venezuela, South Africa, Hungary, Israel, Poland, Pakistan, Turkey. The standard errors are Newey-West heteroskedasticity and autocorrelation adjusted.

countries, nominal exchange rates against the U.S. dollars at the trough month fell by an average of nearly 50 percent against the pre-crisis peaks (Table 8). The impact of these depreciations will depend very much on the level of corporate foreign indebtedness. For example, a 50 percent depreciation is estimated by Gray (1999) to reduce the equity value of Korean corporations by 9 percent and that of Indonesian corporations by fully 21 percent owing to the heavier foreign debt burden of the latter.

Not surprisingly, *corporate crisis dynamics go hand in hand with currency crisis* (Table 9). By the definition used in IMF (1998) all of the seven nontransition episodes involved a currency crisis. For those that took place in the last half of the 1990s, the lag between the currency crisis and the corporate crisis trough averaged 11 months, shorter than for the earlier crises.

Table 8. Crisis Episodes, Nominal Exchange Rate Depreciations

	Chile	Mexico	Poland	Hungary	Mexico	Indonesia	Korea	Malaysia	Thailand
	1983M1	1983M11	1991M11	1992M7	1995M7	1998M5	1998M8	1998M11	1998M11
Trough month compared to pre-crisis peak	-48.9	-81.4	-40.7	-21.1	-49.8	-82.7	-37.8	-34.8	-29.5
One year post-crisis average compared to one year pre-crisis	-33.5	-33.3	-24.2	-12.2	-32.1	-37.6	5.3	3.2	12.2

Source: International Financial Statistics

1/ Local currency per U.S. dollar.

High domestic interest rates, which can result from monetary policy aimed at stemming rapid exchange rate depreciation, can directly squeeze corporate cash flow especially for corporations dependent on domestic bank financing. Nominal interest rates rose above 60 percent ahead of the crisis troughs in Chile, Mexico (1983 and 1995), Poland and Indonesia, although interest rate increases were much smaller for Hungary and Malaysia.[7] Claessens et al. (1999) show that a large share of firms in east Asian countries could not cover interest rate expenses from operational cash flows by 1998.

[7] Money market rates except for Indonesia (call money rate), Chile (lending rate), Mexico (bankers' acceptances rate) and Hungary (treasury bill rate).

Increases in *world interest rates and country risk premiums* will also reduce the cash flow and net worth of firm with high levels of foreign debt. For example, an 8 percent increase in the country risk premium has been estimated to reduce the 1998 equity value of the Korean corporate sector by 2 percent and that of the Indonesian corporate sector by 7 percent again because of Indonesia's higher level of external debt (Gray, 1999).

A *domestic "credit crunch"* is an important link between bad banks, corporate leverage and output contraction. A credit crunch can be defined as the unavailability of financing to creditworthy borrowers at interest rates commensurate with their risk. Credit crunches are attributable to a combination of factors, including higher perceived risk due to a deterioration in the growth outlook, tight monetary policy, a poor risk evaluation culture, a cutoff of external financing and efforts by banks to shore up balance sheets weakened by nonperforming loans. The magnitude of bank distress is evidenced by the incidence of bank crises for all the countries examined here (Table 9). These factors can stall lending not only to heavily indebted corporations but also to viable firms. Real domestic credit (reported in the International Financial Statistics) fell sharply for most of the corporate crisis countries. However, the empirical evidence on the causes of the credit decline is decidedly mixed. Furman and Stiglitz (1998) attribute the credit decline to tight monetary policy. In contrast, Borensztein and Lee (2000) suggest that the credit crunch was more the result of structural changes in the financial sector whose impact on credit allocation may have been exacerbated by the crisis, and Ghosh and Ghosh (1999) conclude that the credit decline is explained mostly by lower credit demand.

Table 9. Crisis Episodes, Currency and Bank Crises

Country	Trough of Industrial Production	Currency Crisis 1/	Lag	Bank Crisis 2/
Chile	January, 1983	June, 1982	7 months	1981–83
Mexico	October, 1983	January, 1982	21 months	1981–82
Hungary	July, 1992	...	...	1991–95
Poland	November, 1991	January, 1990	23 months	1990s
Mexico	July, 1995	December, 1994	7 months	1995
Indonesia	May, 1998	July, 1997	10 months	1998+
Korea	July, 1998	November, 1997	8 months	1998+
Malaysia	November, 1998	August, 1997	15 months	1998+
Thailand	November, 1998	July, 1997	16 months	1998+

1/ From IMF (1998) except for Poland, which is the month of pre-crisis zloty devaluation.
2/ Countries other than those in East Asia from Caprio and Klingebiel (1996).

Finally, *current account adjustment* is a new and important channel that amplifies the impact of a cutoff of capital inflows to the corporate sector on the rest of the economy. In the model of Krugman (1999a), a loss of confidence leads to a cutoff of capital inflows and

prompts a large upward swing in the current account balance. This upward swing requires a sharp depreciation of the exchange rate, which, given the onerous weigh of foreign debt, worsens corporate balance sheets, reduces investment, validates the loss of confidence, and triggers a recession. The increases in the current account during the crisis years for six of the nine episodes is the largest over the past twenty-five years and the second largest for Chile (Table 10). For Hungary and Poland, the current account swings were smaller due to the smaller role played by external financing in the years of central planning. For the east Asian countries, current account adjustment took the form of remarkable contractions of import spending (Appendix A).

Table 10. Corporate Crisis Countries, Current Account Balances

(Percent of GDP)

	Chile 1983	Mexico 1983	Poland 1991	Hungary 1992	Mexico 1995	Indonesia 1998	Korea 1998	Malaysia 1998	Thailand 1998
t-3	-6.2	-5.3	-6.7	-1.8	-6.7	-3.3	-1.7	-10.0	-7.9
t-2	-13.3	-6.3	-2.9	0.4	-5.8	-3.2	-4.4	-4.9	-7.9
t-1	-8.3	-3.7	1.2	0.8	-7.0	-1.8	-1.7	-5.1	-2.0
t	**-5.5**	**3.7**	**-1.2**	**0.9**	**-0.6**	**4.0**	**12.5**	**12.9**	**12.8**
t+1	-10.7	2.4	1.8	-8.9	-0.7	2.4	5.9	11.7	8.8
t+2	-8.5	0.6	-0.1	-9.3	-1.9	...	...	...	...
t+3	-6.7	-1.3	2.2	-5.6	-3.8	...	...	...	...
Year t less average for t-2 and t-3	4.3	9.5	3.6	1.6	5.7	7.3	15.6	20.4	20.7
Year t+2 and t+3 average less year t	-2.2	-4.0	2.2	-8.3	-2.3	...	...	...	...

Source: WEO database, August, 1999.

1/ Projections for 1999.

Bankruptcy serves as a key channel between highly leveraged corporations and economic contraction that emerges during crisis. Bankruptcy introduces a crucial nonlinearity into the relationship between exchange rate depreciation and aggregate output. A crisis-induced increase in debt servicing costs may not just lower marginal aggregate demand, but can push some firms over the edge into liquidation, thereby sharply reducing supply (Kim and Stone, 1999). Bankruptcy thus helps push currency or banking sector turbulence into a full-fledged systemic financial crisis. The impact of bankruptcies is hard to gauge in the absence of comparable cross-country bankruptcy data. However, two proxies are available for bankruptcies in East Asia. First, the World Bank (1999) estimated the share of

"nonviable" firms (estimated losses exceed equity) as of early 1998. These data, which cover only five east Asian countries, suggest a rough correspondence between corporate leverage and nonviability (Figure 8; top panel). Second, a comprehensive cross-country microeconomic data set of nonfinancial firms shows that the share of corporations that filed for legal creditor protection during 1997-98 was much larger in the highly leveraged countries (Figure 8, bottom panel), with the exception of Indonesia, where the incomplete implementation of bankruptcy and judicial reform during 1997 and 1998 delayed bankruptcy procedures for nonviable firms. Analysis of this data set concluded that leverage was an important determinant of filing for legal credit on protection (Claessens et al., 1998b).

B. Crisis Mitigation Policies

The channels between corporate balance sheets and the macroeconomy raised during systemic financial crises greatly complicate monetary and fiscal policies. These channels are especially hard for policymakers to deal with because the shortfall of corporate balance sheet data and a generally poor understanding of balance sheet channels can lead to underestimation of the contractionary impulse.

Shaky corporate balance sheets limit *the ability of monetary policy to stabilize exchange rates during the contraction* (Furman and Stiglitz, 1998). Ordinarily, an increase in interest rates appreciates the exchange rate by raising the rate of return on domestic currency securities—as long as the expected future exchange rate remains unchanged. However, higher interest rates can bankrupt heavily leveraged corporations and undermine confidence. Thus, the effect of higher interest rates on the exchange rate can be perverse: markets may expect the central bank to inflate in the long term so as to offset the impact of bankruptcies on employment and output, which could lead to the expectation that the exchange rate will depreciate in the future. The empirical evidence on interest rate hikes and exchange rate stabilization is mixed (e.g., Goldfajn and Gupta, 1999; Furman and Stiglitz, 1998; Goldfajn and Baig, 1999; Ghosh and Basurto, 2000).

Determination of the appropriate stance of fiscal policy also is complicated by uncertainty regarding the level of economic activity, as well as by the costs of bank restructuring and the outstanding level of public debt. The extent of the recession tends to be underestimated by a long shot (Begg, 1996 and Lane et al., 1999). In East Asia, fiscal policy was tightened initially to hold shift upward the current account balance and to offset the cost of financial restructuring. However, after the extent of the downturns became apparent fiscal policy soon turned expansionary and exerted a positive stimulus. The underestimation of the economic contraction reflects the masking of corporate sector balance sheet problems by poor and limited data. The appropriate fiscal response depends also on the initial level of public debt. Low levels of public debt gave transition and east Asian countries more leeway for fiscal stimulus at the time of their crises, but high debt levels narrowed the scope for fiscal policy for the Latin American countries.

Declines in domestic credit, irrespective of their cause, can lead to intense *pressures on government to take action to stem the credit crunch.* But policy measures to address a

credit crunch depend on its causes, which are especially difficult to discern. Measures include a looser monetary policy, subsidized credit especially to small borrowers, a temporary easing of capital adequacy ratios, and bank recapitalization. Quantification of the effectiveness of these responses is especially difficult.

Finally, the impact of systemic financial crises on the real sector can be mitigated by *government policies that promote nonbank sources of corporate financing*. Nonbank financing helped limit the impact of the slowdown of American bank lending in 1990 that resulted from a collapse in the value of real estate collateral (Greenspan, 1999). This stands in contrast to the experience of the corporate crisis countries examine here. For example, according to the Governor of the Bank of Thailand: "In Thailand, the lack of a liquid bond market meant that the only way to obtain liquidity under pressure was for the banks to come to the Bank of Thailand using their entire loan portfolio as collateral. As the crisis deepened, these loans were deteriorating day by day" (Chatu Mongol, 2000). The backstopping service provided by nonbank intermediaries is another rationale for government policies in support of financial system infrastructure.

IV. Recovery Phase

During the recovery phase the economy rebounds and the government takes on a large role in the economy to bring about the restructuring of the corporate sector. The inherently conflicting and evolving goals of large-scale corporate restructuring prolong its successful completion. Even after restructuring can be deemed complete, the government faces further challenges in reducing its role to promote long-term growth. In this section, the pattern of the post-crisis economic rebound is examined, and large-scale corporate restructuring policies are summarized.

A. Economic Rebound

Restarting economic growth requires the entrenchment of *macroeconomic stability* to ensure the normal operation of viable firms (World Bank, 1996 and Lane et al., 1999). The settling down of the exchange rate required to restore confidence and stem capital outflows hinges largely on a firm monetary policy and the announcement of structural measures.[8] In fact, there is some evidence that the announcement of credible structural reforms have a positive impact on asset prices (Kaminsky and Schmukler, 1999). Cessation of a depreciation-inflation spiral will allow interest rates to fall, thereby reducing the costs of corporate financing. Lower interest rates improve confidence and promote a recovery in demand, raising sales and production. Interest rates in real terms are usually brought down to near or below zero after the trough of a corporate crisis.

[8] The experiences of Mexico in 1995 and Indonesia are instructive counterfactuals.

Stability is followed by a *recovery of industrial production*. The speed of the post-crisis turnaround in industrial production during the recent crises was unexpected (Table 5 and Figure 5). For the 1995-99 crises, industrial production took an average of 25 months to recover to its pre-crisis peak. Dated from the crisis trough month, industrial production during the 1995–99 crises took an average of only 10 months to recover to the pre-crisis peak. These indicators suggest the pace of recovery is faster in the later crises, suggesting that the faster onset of crisis reported in Section II is matched by faster recovery.

GDP growth also recovers relatively quickly. For the later crises, GDP contracts for one or two years, whereas during the crises of 1983–92 real activity shrank for two or three years (Appendix A). Recovery in the short term (the first year after the crisis) is generally led by private consumption, and in the crises of the 1990s by exports. Interestingly, fixed capital formation generally does not quickly recover, despite its sharp contraction during the crisis year. Inventory reaccumulation drove the recovery in several countries, including, generally, for East Asia. The resurgence of domestic demand offsets the negative effect on growth of the unwinding of import compression.

Stock market indices generally turn around quickly after the crisis trough but do not make up for the ground lost as a result of the crisis (Figure 3). The exceptions are Chile during the 1983 debt crisis, Hungary in 1992–93 when its restructuring efforts met with mixed results, and Mexico in 1995 when its recovery faltered. All of the east Asian stock markets have improved but to varying degrees, and as of early 2000 indices remained far short of their pre-crisis highs. The varying levels of stock market recovery may reflect different pre-crisis overvaluations and the broad range of success in restructuring. Also notable is the more rapid turn around of the east Asian stock markets compared to the earlier crises.

B. Restructuring Policies

Large-scale corporate restructuring is the main policy challenge of the recovery phase. This challenge has proved to be one of the most daunting faced by economic policymakers, judging by the experience of the nine countries examined here.[9] The government is forced to take a leading role, even if indirectly, by the need to prioritize restructuring goals, address market failures, reform the legal and tax systems, and, perhaps most important, deal with the obstructions posed by powerful interest groups. The broad policy objectives in the context of a systemic financial crisis can be reduced to:

---

[9] The general principles of corporate restructuring are discussed in Begg and Portes (1992), Fries and Lane (1994), and van Wijnbergen (1994). Rare examples of theoretical analysis of the broad issues include Aghion, Blanchard, and Carlin (1994) and Aghion et al. (1996). Cross-country experiences with corporate restructuring are presented in Carlin and Landesmann (1997), World Bank (1996), Stone (1998), Claessens et al. (1999), World Bank (1999), BIS (1999), and Stone (2000), which is the basis for this section.

- restructuring viable corporations and liquidating nonviable corporations;
- restoring the health of the financial sector; and,
- creating the conditions for long-term economic growth.

Laying the foundation for large-scale restructuring is the first set of tasks. A holistic strategy for restructuring encompassing the corporate and financial sectors should be formulated as soon as possible after the crisis is judged to be systemic in scope. Macroeconomic stability must be entrenched to foster debt restructuring transactions. A supporting legal, regulatory and accounting environment is a necessary condition for successful corporate restructuring. The difficulties raised in the establishment of a supporting environment, which is often exacted by pressures from interest groups, have proven to be a serious impediment to restructuring in East Asia (World Bank, 2000). Corporate governance must be brought up to international standards to provide incentives for viable firms to restructure their balance sheets and maximize their surplus value. Government policies to offset the social costs of restructuring are needed to help sustain continued political support for restructuring over the long haul.

Even after the foundation has been laid *corporate restructuring cannot begin in earnest until substantial progress has been made in financial sector restructuring*, given the intertwining of banks and corporations. The first task of financial restructuring is separating out the viable from the nonviable institutions to the extent possible. Thereafter, nonviable banks should be shut down and their assets sold or shifted to an asset management corporation, and viable banks should be recapitalized.

Government-led corporate restructuring modalities, based on the restructuring efforts for the nine episodes examined in this paper, can be divided into five categories in order of government involvement.

- *Government mediation* between corporations and banks or between banks is warranted if there are factors that inhibit creditors from leading corporate restructuring. This approach offers flexibility and adaptability, but requires a credible government mediator, macroeconomic stability, and the appropriate regulatory setting.
- Financial incentives through *a preset government-financed scheme* can be useful if corporate distress is systemic and there are market or regulatory failures which inhibit restructuring.
- *Recapitalization of banks by the government* is warranted if corporate debt problems are pervasive enough to undermine the health of the banking system, and banks are willing and able to restructure corporations on their own.

- A new *government-financed asset management company* (AMC) to manage the assets of distressed financial institutions is called for if the number of troubled corporations is large and there are microeconomic factors which severely inhibit restructuring (Woo, 2000).

- The complexities of the corporate and financial restructuring efforts of many of the recent corporate crisis countries have led to the appointment of a *restructuring director* to accelerate the pace of reform when there are a large number of players with conflicting interests and systemic consequences increase the costs of delays.

The experience of the countries examined here provides a few *general lessons regarding large-scale corporate restructuring.* Governments should be prepared to take on a large role if a corporate crisis is judged to be systemic. The first step is formulation of a broad strategy encompassing corporate and financial sector restructuring, developed to the extent possible with the involvement of the interested parties, and presented transparently. Restructuring goals should be stated at the outset and sunset provisions embedded into the enabling legislation for new restructuring institutions based on these goals. Measures should be taken quickly to offset the social costs of crisis and restructuring. The choice and role of new institutions will reflect the willingness and ability of banks to lead restructuring. Bank recapitalization can be used as an incentive to further corporate restructuring. At the same time, the needed changes to the legal and tax frameworks should be put in place. A determined effort to establish effective bankruptcy procedures in the face of pressures from vested interest groups is essential.

If the corporate restructuring is sustained then *long-term growth prospects are enhanced.* Indeed, it has been argued that crisis can actually enhance growth in the long run by weakening special interests that had blocked restructuring (Rodrik, 1996). In Chile, growth and productivity have improved sharply following the restructuring efforts triggered by the debt crisis of the early 1980s. Industrial productivity in the east European transition countries that pushed ahead with restructuring seems to have greatly improved judging by the success of their exports to EU countries (Carlin and Landesmann, 1998).

V. Conclusion

The move to center stage of corporate sector dynamics in the systemic financial crises of the 1990s has raised important new macroeconomic and structural policy challenges. This paper has put together a set of stylized facts of corporate crisis dynamics with a view to identifying the key issues and their policy implications.

The *key stylized facts* of corporate sector crisis dynamics based on this examination of nine recent crisis episodes can be summarized as follows:

- Corporate sector crisis dynamics are rooted in interventionist government policies that greatly increase vulnerability to crisis.

- The buildup of vulnerability is associated with high levels of corporate borrowing largely from domestic banks.
- Corporate crisis dynamics are triggered by a sudden reversal of capital inflows prompted by a downward shift in expectations or by external events.
- The cut off of capital inflow is amplified into an historically severe recession by exchange rate and bank crises, high interest rates, and current account adjustment.
- The recovery of production typically takes place within two years.
- There is some evidence that the speed of the transmission of corporate sector crisis dynamics is accelerating.
- Large-scale post-crisis corporate restructuring seems to take at least five years to complete.
- Restructuring is facilitated by a supporting legal environment, early formulation of a holistic government-led strategy, and stiff resistance to vested interest groups.

Two main policy messages emerge from this paper. First, governments and international agencies can reduce the risk of a crisis by *improving their collection of data from the corporate sector.* As a start, governments could begin to work with private sector data collection and reporting sources to put together high quality databases. Complete and timely macroeconomic flow of funds accounts would enhance monitoring of the corporate sector. Similarly, changes to the international financial architecture could encompass higher standards for corporate data.[10] Better balance sheet data could be fed into "early warning systems" based on simple financial indicators as well as profit simulations and forward-looking balance sheet models. If leverage is judged excessive, actions should be taken to reduce corporate debt. Surely the costs of improving the collection of corporate data, even if equivalent to a significant increase in government resources budgeted for statistics, exceeds that of the risks posed by a systemic corporate crisis (Gray 1999).

Second, governments can reduce corporate vulnerability *by increasing the corporate financing role of nonbank capital markets* through measures to enhance financial market infrastructure. Equity, commercial paper and bond markets widen participation and improve risk bearing. Nonbank capital markets serve as alternative sources of corporate financing upon the drying up of bank credit. Improvements in financial infrastructure that boost the

[10] The corporate sector is the subject of but one of the 45 economic and financial standards listed on the website of the Financial Stability Forum (FSF) that are internationally accepted as relevant to well-functioning financial systems (www.fsforum.org/standards). The standard that covers the corporate sector is the OECD's Principles of Corporate Governance.

role of nonbank capital markets thus generate a positive crisis-prevention externality, over and above the benefits for efficiency and growth, that warrants a role for the government. Measures to improve financial sector infrastructure encompass improvements in accounting standards, judicial and legal systems, and other institutional nuts and bolts such as clearings, settlements and payment systems (Caprio et al., 1994). Although the benefits to these measures may not seem obvious in ordinary circumstances, they become much more apparent in a crisis. These measures also improve corporate governance, another important determinant of crisis vulnerability.

Recommendations on policies to *dealing with a crisis as it unfolds* are more tentative. A main problem for macroeconomic policy is that the output contraction tends to be much larger than anticipated, reflecting poor corporate balance sheet data. Expansionary policies are called for if the problems of nonviable firms are hurting viable firms and unduly impairing overall confidence. However, monetary policy in the case of exchange rate overshooting for open economies must strike a careful balance between the objectives of avoiding a depreciation-inflation spiral on the one hand, and exacerbating an unexpectedly severe economic contraction on the other. This balance seems to be more difficult to strike in the context of the large current account adjustments that marked the crises of the 1990s. Again, better corporate data would help the authorities meet these challenges by clarifying the quality and vulnerability of corporate balance sheets.

There are many areas for further analytical work on corporate crises given the dearth of analyses of them and the likelihood that they will recur in the future. The early warning system tools could be developed and refined. Theoretical models of the links between the microeconomic roots of corporate crisis dynamics and their macroeconomic consequences would help provide a framework for policy responses. There is an urgent need for comprehensive models of corporate restructuring to enhance understanding of the tradeoffs between conflicting objectives. Finally, cross country data and analyses of the different restructuring modalities would provide guidance for ongoing and future restructuring efforts.

Appendix I. Corporate Crisis Countries, Contributions to Real GDP Growth, Crisis Years

(In percent contribution to real GDP growth)

	GDP	Public consumption	Private consumption	Gross fixed capital formation	Changes in inventories	Imports	Exports
			Chile 1983				
t	-3.5	-0.3	-6.3	-2.6	0.0	5.7	0.0
t+1	6.1	-0.2	5.4	3.6	0.0	-3.3	0.6
t+2	3.5	0.2	-5.6	2.0	1.0	2.8	3.2
t+3	5.6	0.1	3.4	0.4	0.9	-2.0	2.8
t+4	6.6	-0.3	4.7	3.7	1.3	-4.8	2.0
t+5	7.3	0.4	4.6	2.8	-0.2	-3.7	3.4
			Mexico 1983				
t	-4.2	0.3	-3.7	-5.8	-0.3	3.5	1.4
t+1	3.6	0.7	2.2	1.0	0.0	-1.3	0.7
t+2	2.6	0.1	2.3	1.3	0.8	-1.1	-0.4
t+3	-3.7	0.3	-1.8	-2.0	-2.7	0.9	0.5
t+4	1.7	-0.2	0.1	0.0	1.0	-0.4	1.2
t+5	1.3	-0.1	0.9	0.9	2.1	-3.2	0.8
			Poland 1991				
t	-7.0	1.4	3.6	-0.7	-3.5	-3.7	-0.3
t+1	2.6	1.0	1.6	0.4	-2.7	-0.3	2.1
t+2	3.8	0.6	3.4	0.5	1.5	-2.3	0.7
t+3	5.2	0.4	2.8	1.5	0.0	-2.1	2.7
t+4	7.0	0.5	2.1	2.8	-1.0	-4.8	5.1
t+5	6.0	0.6	5.1	3.7	2.3	-6.5	3.1
			Hungary 1992				
t	-3.1	0.5	0.0	-0.5	-2.5	-0.1	0.7
t+1	-0.6	2.9	1.4	0.4	3.5	-6.2	-3.4
t+2	2.9	-1.7	-0.1	2.4	1.3	-3.3	4.1
t+3	1.5	-0.5	-5.1	-0.9	2.1	0.6	4.1
t+4	1.3	-0.4	-1.8	1.3	1.7	-2.5	3.1
t+5	4.6	0.2	1.3	1.9	1.1	-10.3	10.4

Appendix I. Corporate Crisis Countries, Contributions to Real GDP Growth, Crisis Years (Continued)

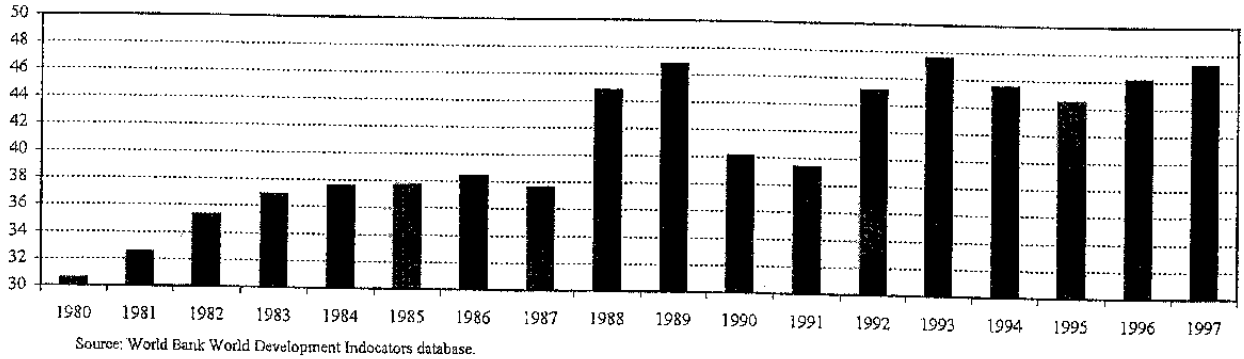
	GDP	Public consumption	Private consumption	Gross fixed capital formation	Changes in inventories	Imports	Exports
			Mexico 1995				
t	-6.2	-0.1	-6.9	-5.6	-2.1	3.3	5.2
t+1	5.2	-0.1	1.5	2.4	1.6	-4.6	4.3
t+2	7.0	1.2	4.3	3.5	-0.3	-5.2	3.5
t+3	4.6	-0.9	4.3	1.8	1.2	-4.0	2.2
t+4	3.0	0.1	1.8	0.1	0.3	-1.8	2.5
			Indonesia 1998				
t	-13.7	-0.3	-14.9	-11.6	-5.4	8.4	8.7
t+1	-0.8	0.9	-0.5	-3.2	1.7	4.4	-2.4
			Korea 1998				
t	-5.8	0.0	-5.2	-7.3	-5.6	7.3	4.8
t+1	6.5	-0.2	3.5	0.1	5.3	-8.4	6.3
			Malaysia 1998				
t	-6.7	-0.5	-5.5	-21.2	0.4	22.7	-2.7
t+1	2.4	1.2	2.6	2.5	0.3	-14.0	9.8
			Thailand 1998				
t	-9.4	-1.2	-8.3	-13.2	-1.1	12.0	2.4
t+1	4.0	0.8	2.2	0.7	2.7	-6.7	3.8

Source: August 1999 World Economic Outlook database.

1/ Forecasts for 1999.

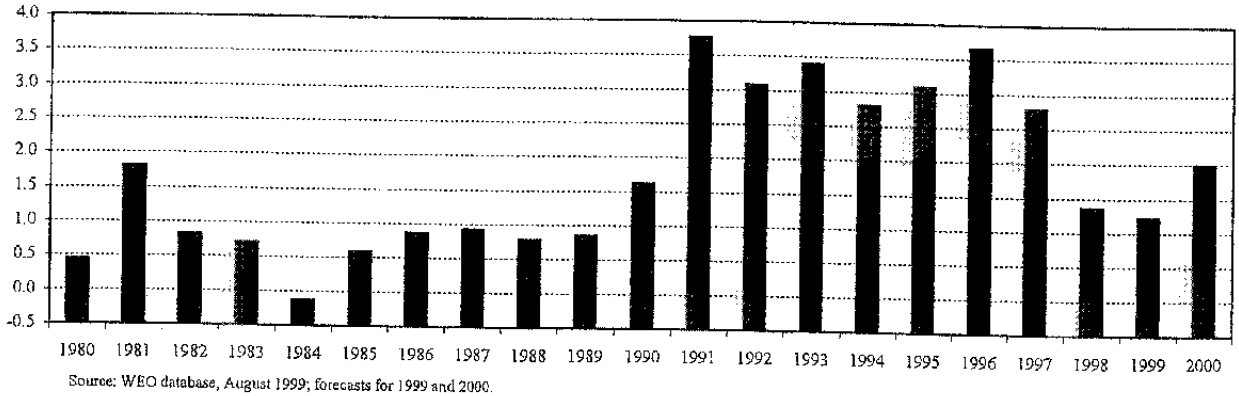
Figure 1. Developing Countries, Domestic and External Credit, 1980-2000
(In percent of GDP)

Low- and Middle-Income Countries, Domestic Bank Claims on Private Sector



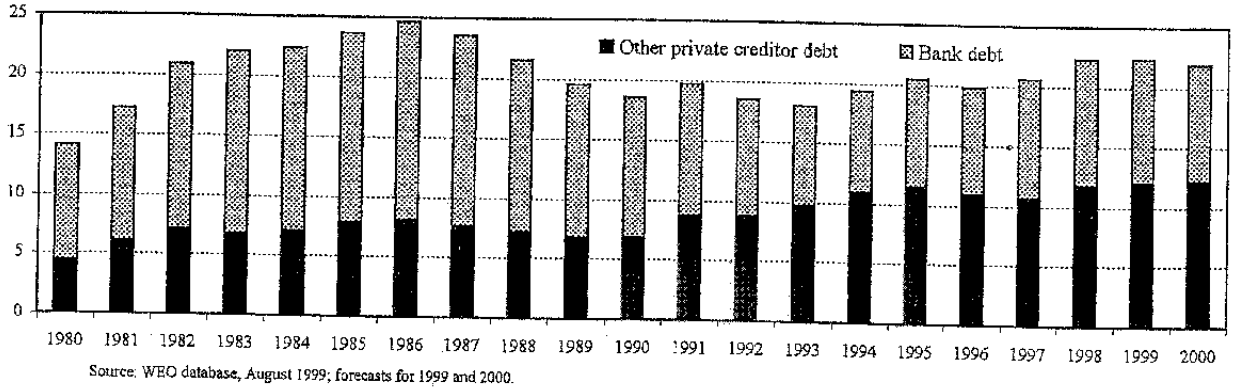
Source: World Bank World Development Indocators database.

Developing Countries, Net Private Capital Flows (excluding reserves)



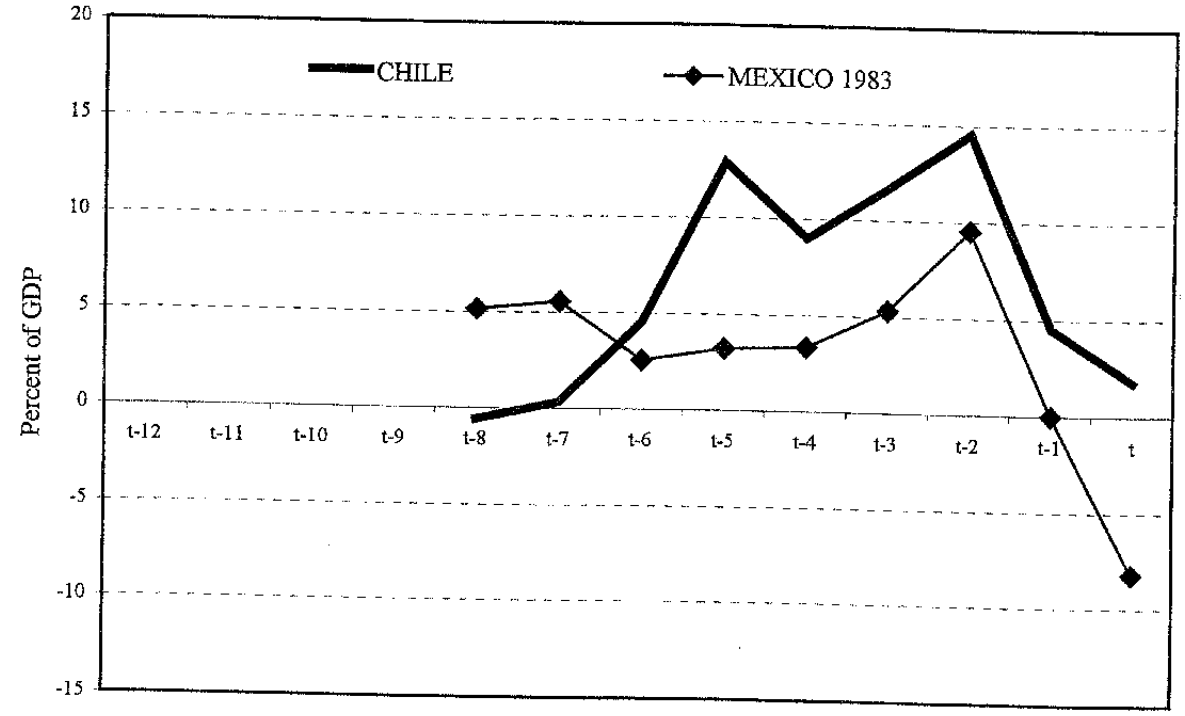
Source: WEO database, August 1999; forecasts for 1999 and 2000.

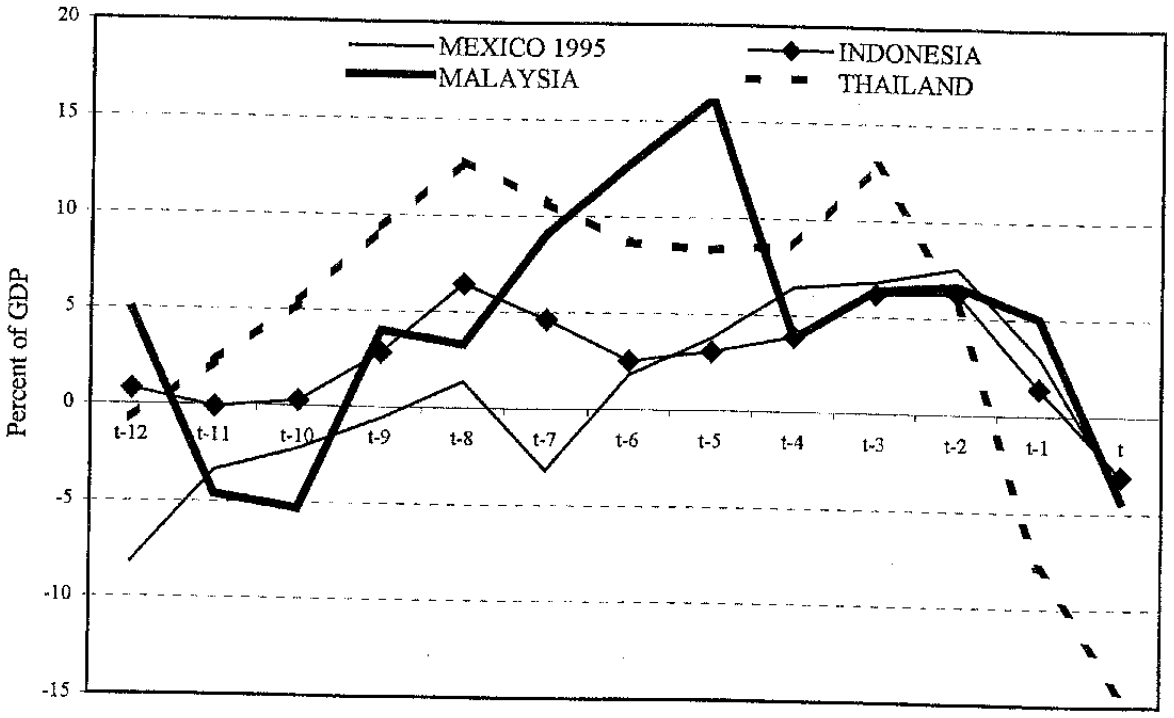
Developing Countries, Bank and Nonbank External Debt



Source: WEO database, August 1999; forecasts for 1999 and 2000.

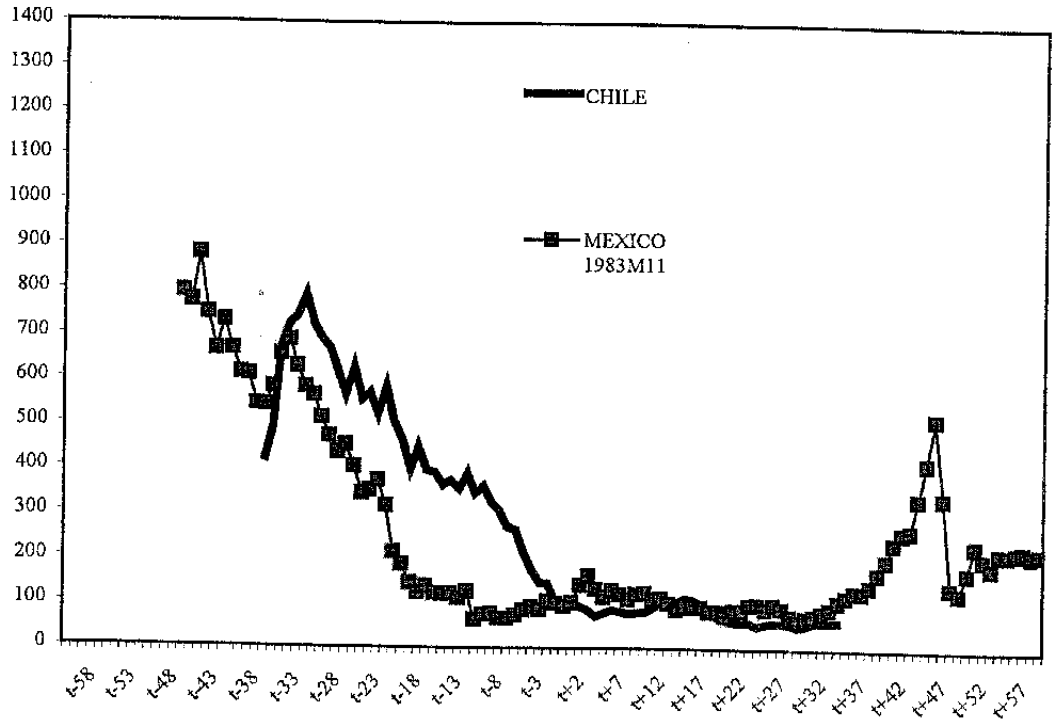
Figure 2. Corporate Crisis Countries, Net Private Capital flows (excluding reserves)

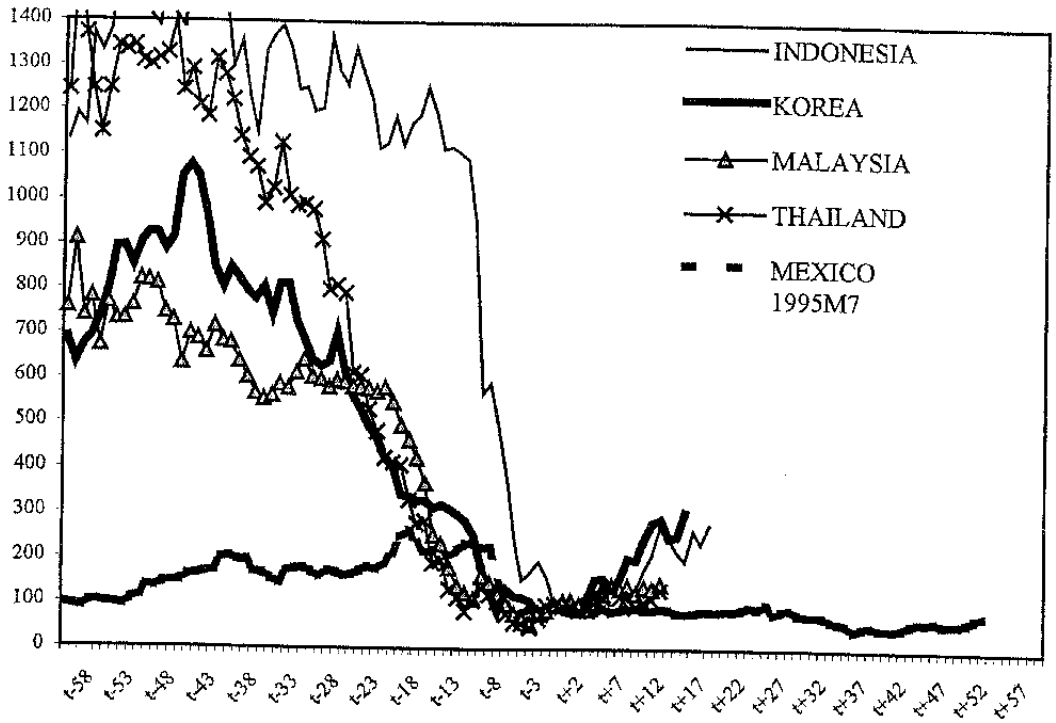




Source: WEO database, August, 1999.

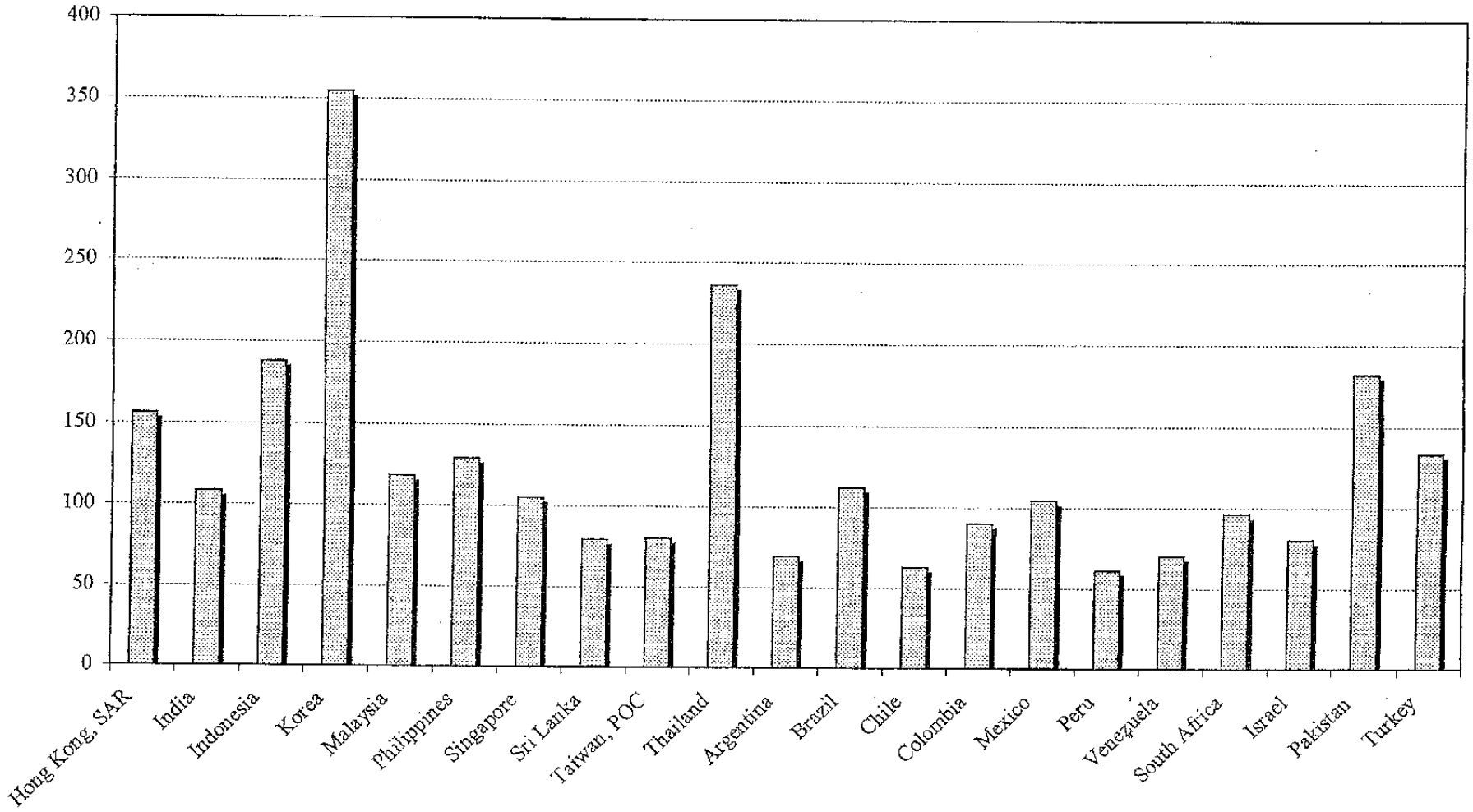
Figure 3. Corporate Crisis Countries, Relative Stock Market Indices
(Relative to U.S. stock market index; crisis month=100)





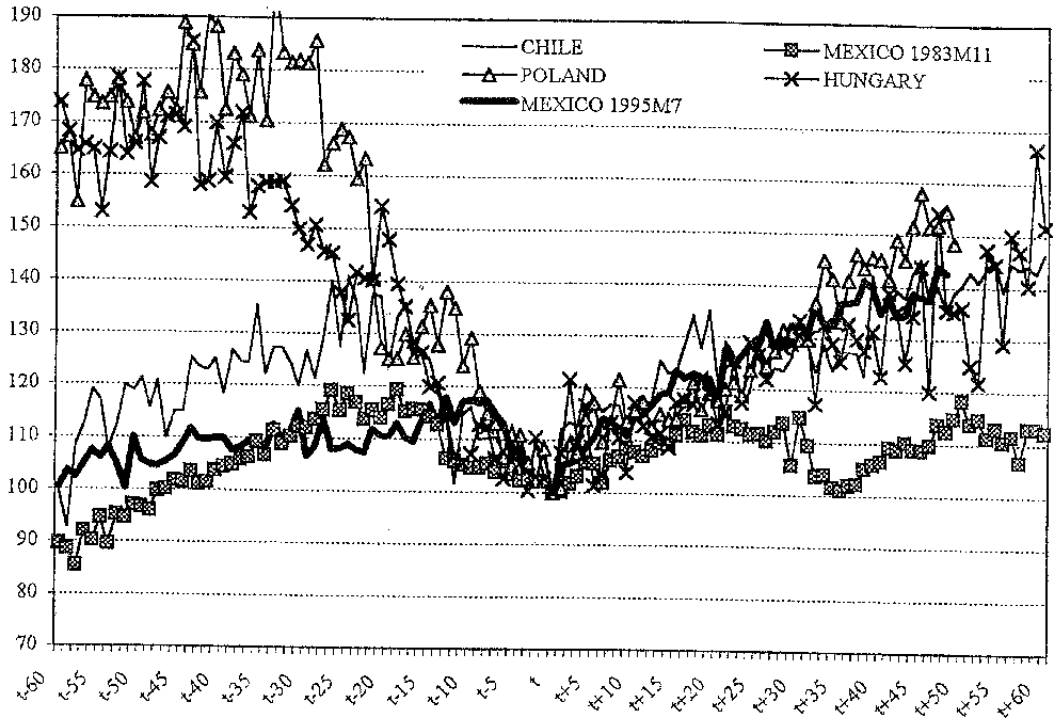
Sources: IFC.

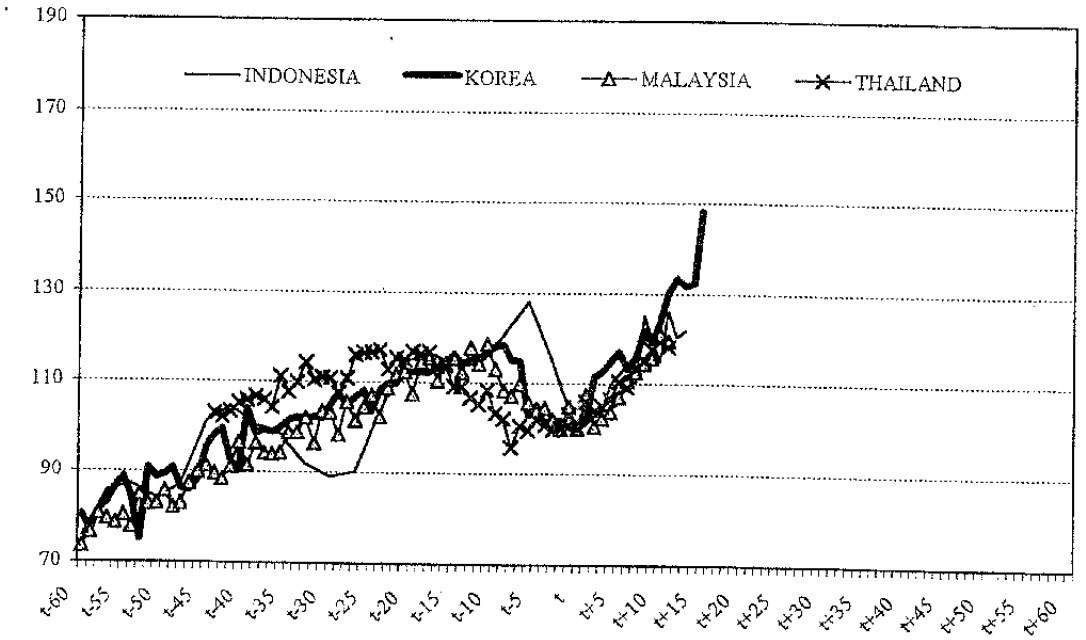
Figure 4. Selected Countries: Corporate Leverage, 1996



Source: Claessens et al. 1998b.

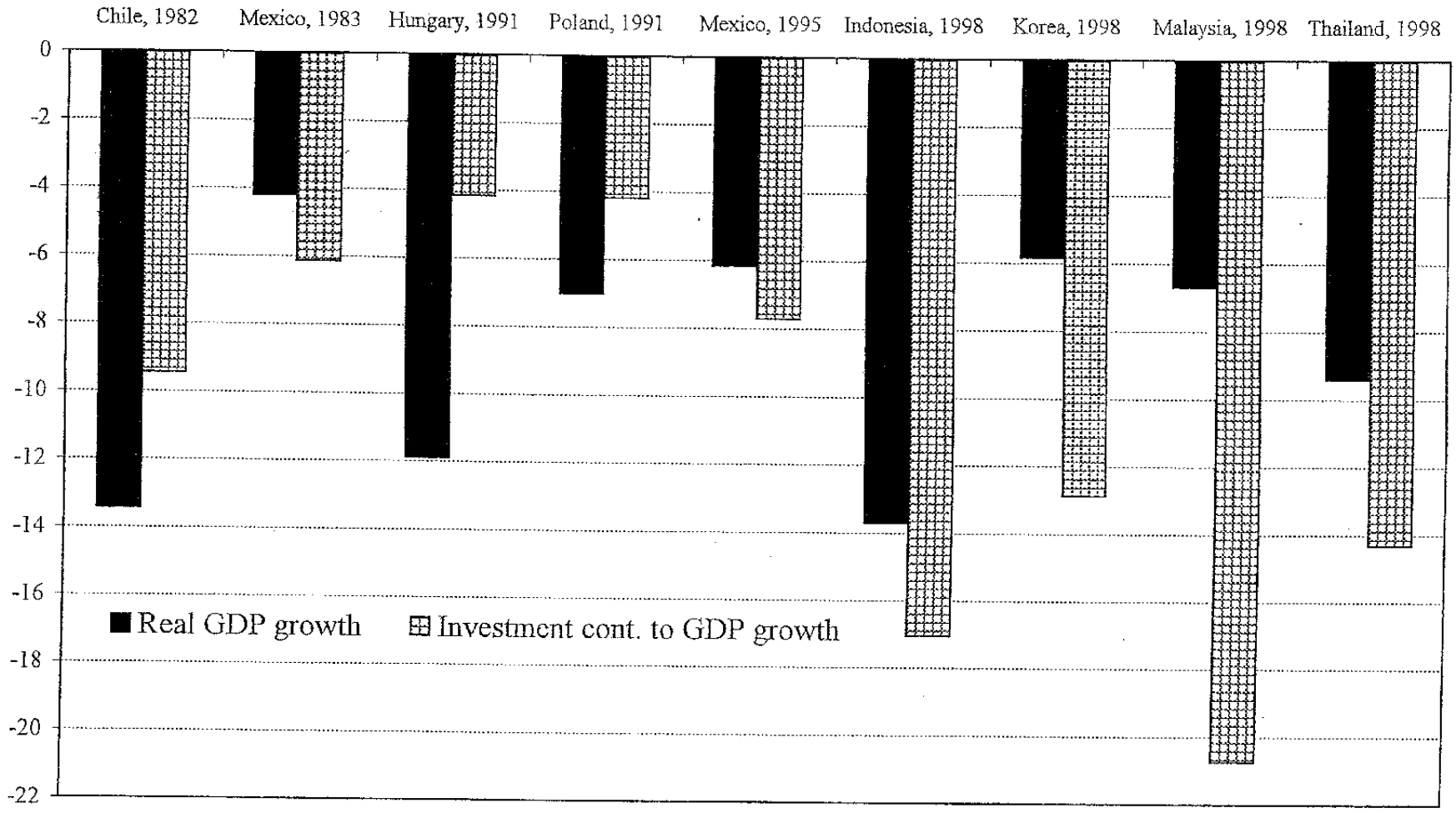
Figure 5. Corporate Crisis Countries: Industrial Production
(Seasonally adjusted, crisis trough month = 100)





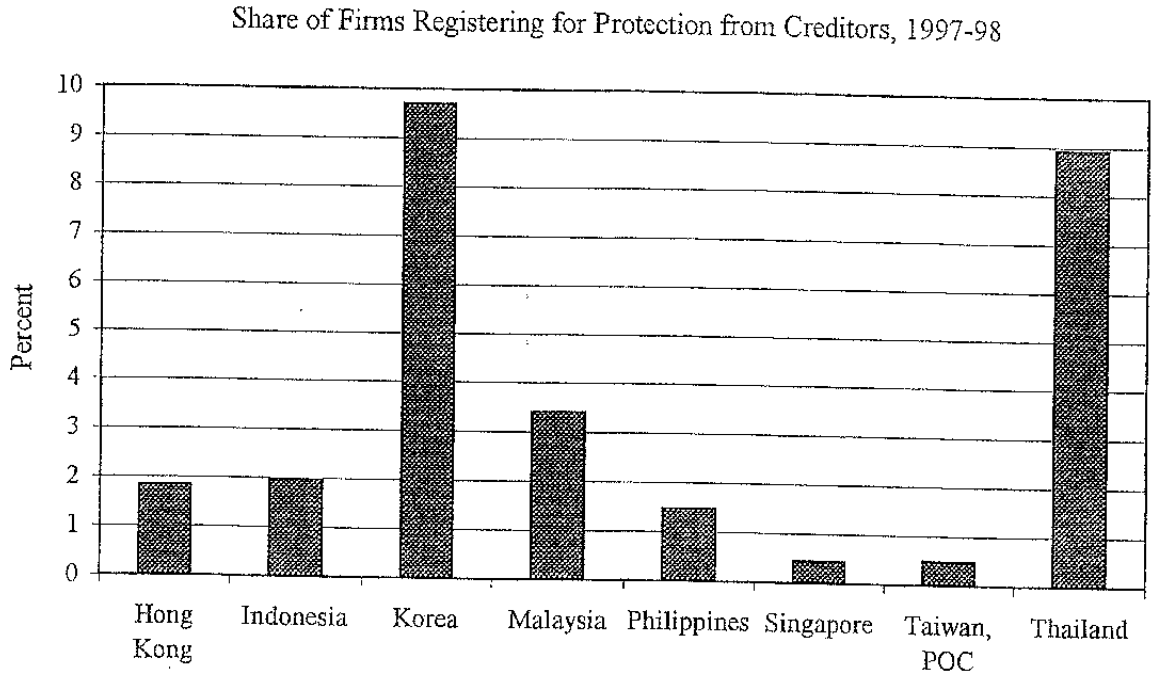
Source: IFS.

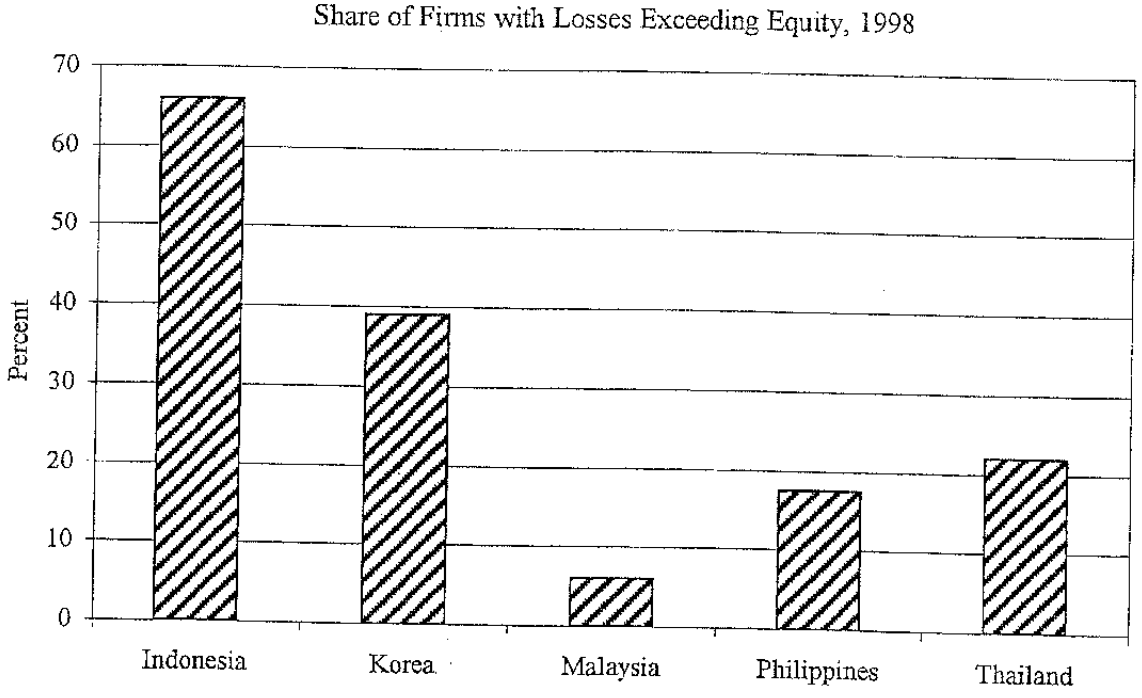
Figure 6. Corporate Crisis Countries, Real GDP Growth and Contribution of Investment to Real GDP Growth



Source: WEO database.

Figure 7. East Asia Corporate Crisis Countries, Corporate Viability Indicators, 1997-98





Source: World Bank.

References

Adams Charles, Donald J. Mathieson, Garry Schinasi, and Bankim Chadha, 1998, "International Capital Markets Developments, Prospects, and Key Policy Issues," IMF *World Economic Outlook,* September.

Aghion, Philippe, Olivier Jean Blanchard, and Wendy Carlin, 1994, "Economics of Enterprise Restructuring in Central and Eastern Europe," Discussion Paper Series No. 1058 (November), pp.1–39 (London: Centre for Economic Policy Research).

Aghion, Philippe, Olivier Blanchard and R. Burgess, 1996, "The Behavior of State Firms in Eastern Europe Pre-privatization," *European Economic Review* 38, 1327–49.

Aghion, P. Bacchetta, P., and Banarjee, A., 1999, "A Simple Model of Monetary Policy and Currency Crises," mimeo.

Alexander, William E, Jeffrey Davis, Liam P. Ebrill, Carl-Johan Lindgren, eds., 1997, *Systemic Bank Restructuring and Macroeconomic Policy* (Washington: International Monetary Fund).

Bank of International Settlements, 1999, "Bank Restructuring in Practice," Policy Paper No. 6, August, Basel.

Begg, David, and Richard Portes, 1992, "Enterprise Debt and Economic Transformation: Financial Restructuring of the State Sector in Central and Eastern Europe," Discussion Paper Series No. 695 (June), pp. 1–43 (London: Centre for Economic Policy Research).

Begg, David, 1996, "Monetary Policy in Central and Eastern Europe: Lessons after Half Decade of Transition," IMF Working Paper No. 96/108 (Washington: International Monetary Fund).

Berg, Andrew, and Catherine Pattillo, 1999, "Are Currency Crises Predictable? A Test," *Journal of International Money and Finance*, Vol. 18; No. 4, pp. 561–86.

Bernanke, Ben S. and Cara S. Lown, 1991, "Credit Crunch," *Brookings Papers on Economic Activity* (U.S.), No. 2, pp. 205–47 (Washington).

Bernanke, Ben Mark Gertler and Simon Gilchrist, 1998, "The Financial Accelerator in a Quantitative Business Cycle Framework," NBER Working Paper No. 6455, March.

Borensztein, Eduardo and Jonathan D. Ostry, 1992, "Structural and Macroeconoic Determinants of the Output Decline in Poland, 1990–91," IMF Working Paper No. 92/86 (Washington: International Monetary Fund).

Borensztein, Eduardo and Jong-Wha Lee, 1999, "Credit Allocation and Financial Crisis in Korea", IMF Working Paper No. 99/20 (Washington: International Monetary Fund).

_____, 2000, "Financial Crisis and Credit Crunch in Korea: Evidence from Firm-Level Data", IMF Working Paper No. 00/25 (Washington: International Monetary Fund).

Calvo, Guillermo, and Enrique Mendoza, 1998, "Rational Herd Behavior and the Globalization of Securities Markets," mimeo.

Caprio, Gerald, Izak Atiyas and James A. Hanson, eds., 1994, *Financial Return: Theory and Experience* (Cambridge: England, Cambridge University Press).

Caprio, Gerald and Daniela Klingebiel, 1996, "Bank Insolvencies: Cross-Country Experience," World Bank Working Paper 1620, July.

Carlin, Wendy, and Michael Landesmann, 1997, "From Theory into Practice? Restructuring and Dynamism in Transition Economies," *Oxford Review of Economic Policy*, Vol. 13, pp. 77–105, Summer.

Chatu Mongol, M.R., 2000, "Keynote Address on the Occasion of the ADB Conference on Government Bond Market and Financial Sector Development in Developing Asian Economies", Bangkok, March.

Claessens, Stijn, Simeon Djankov, and Giovanni Ferri, 1999, "Corporate Distress in East Asia: Assessing the Impact of Interest and Exchange Rate Shocks," Emerging Markets Quarterly, 3 (Summer): 4-9.

Claessens, Stijn, Simeon Djankov, and Larry Lang, 1998a, "Who Controls East Asian Corporations," mimeo (Washington: World Bank).

_____, 1998b, "Corporate Growth, Financing, and Risks in the Decade before East Asia's Financial Crisis," Policy Research Working Paper 2017, November.

_____, 2000, "East Asian Corporations: Heroes or Villains?," World Bank Discussion Paper No. 409, January.

Claessens, Stijn, Simeon Djankov, and Daniela Klingebiel, 1999, "Financial Restructuring in East Asia: Halfway There?," World Bank Financial Sector Discussion Paper No. 3, September.

Corsetti, Giancarlo, Paolo Pesenti and Nouriel Roubini, 1998, "Paper Tigers? A Model of the Asia Crisis," NBER Working Paper No. 6783.

Cottarelli, Carlo, Thomas Krueger, Reza Moghadam, Perry Perone, Edgardo Ruggiero, and Rachel van Elkan, 1998, *Hungary: Economic Policies for Sustainable Growth,* IMF Occasional Paper No. 159 (Washington, International Monetary Fund).

Demirgüç-Kunt, Asli and Enrica Detragiache, 1999, "The Determinants of Banking Crises : Evidence from Developing and Developed Countries," *IMF Staff Papers*, Vol. 45:1, pp. 81–109, March (Washington: International Monetary Fund).

Dooley, Michael, 1997, "A Model of Crises in Emerging Markets," NBER Working Paper No. 6300, December.

Dziobek, Claudia and Ceyla Pazarbaşioğlu, 1997, "Lessons from Systemic Bank Restructuring: A Survey of 24 Countries," IMF Working Paper No. 97/161 (Washington: International Monetary Fund).

Eichengreen, Barry, Andrew Rose and Charles Wyplosz, 1996, "Contagious Currency Crises," NBER No. 5681, July.

Fisher, Irving, 1993, "The Debt-Deflation Theory of Great Depressions," Econometrica 1, pp. 337–57.

Fries, Steven M., and Timothy D. Lane, 1994, "Financial and Enterprise Restructuring in Emerging Market Economies," IMF Working Paper No. 94/34 (Washington: International Monetary Fund).

Furman, Jason, and Joseph Stiglitz, 1998, "Economic Crises: Evidence and Insights from East Asia, Brookings Papers on Economic Activities (U.S.); No. 2:1, pp. 135.

Frydl, Edward, J., 1999, "The Length and Cost of Banking Crises," IMF Working Paper No. 99/30 (Washington: International Monetary Fund).

Ghosh, Swati, and Atish Ghosh, 1999, "East Asia in the Aftermath - Was There a Crunch?," IMF Working Paper No. 99/38 (Washington: International Monetary Fund).

Ghosh, Atish and Gabriela Basurto, 2000, "The Interest Rate-Exchange Rate Nexus in the Asian Crisis Countries," IMF Working Paper No. 00/19 (Washington: International Monetary Fund).

Goldfajn, Ilan, and Poonam Gupta, 1999, "Does Monetary Policy Stabilize the Exchange Rate Following a Currency Crisis?," IMF Working Paper No. 99/42 (Washington: International Monetary Fund).

Goldfajn, Ilan and Valdes, Rodrigo O., 1995, "Currency Crises and Collapses," Brookings Papers on Economic Activity, June, No. 2, pp. 219–70.

Goldfajn, Ilan, and Taimur Baig, 1998, "Monetary Policy in the Aftermath of Currency Crises: The Case of Asia," IMF Working Paper No. 98/170 (Washington: International Monetary Fund).

Goldstein, Morris and Philip Turner, 1996, "Banking Crises in Emerging Economies: Origins and Policy Options," BIS Economic Papers No. 46 (Basel).

Gray, Dale, 1999, "Assessment of Corporate Sector Value and Vulnerability: Links to Exchange Rate and Financial Crises," World Bank Technical Paper No. 455 (Washington: World Bank).

Greenspan, Alan, 1999, "Do Efficient Financial Markets Mitigate Financial Crises?," speech to the 1999 Financial Markets Conference of the Federal Reserve Bank of Atlanta, October.

Gupta, Sanjeev, Calvin McDonald, Christian Schiller, Marijn Verhoeven, Z. Bogetic, and Gerd Schwartz, 1998, "Mitigating the Social Costs of the Economic Crisis and the Reform Programs in Asia," IMF Paper on Policy Analysis and Assessments No. 98/7 (Washington: International Monetary Fund).

Hardy, Daniel C. and Ceyla Pazarbaşioğlu, 1998, "Leading Indicators of Banking Crises–Was Asia Different?" IMF Working Paper No. 98/91, June (Washington: International Monetary Fund).

International Monetary Fund, 1998, *World Economic Outlook*, May (Washington).

_____, 1999, *World Economic Outlook*, August (Washington).

_____, 1999, *Financial Sector Crisis and Restructuring – Lessons from Asia* (Washington).

Johnson, Simon, Peter Boone, Alistair Breach, and Eric Friedman, 1999, "Corporate Governance in the Asian Financial Crisis, 1997–98," mimeo, July (city:organization).

Kamin, Steven, Philip Turner and Jozef Van 't dack, 1999, "The Transmission Mechanism Of Monetary Policy In Emerging Market Economies: An Overview", in *The Transmission Mechanism Of Monetary Policy In Emerging Market Economies*, Bank For International Settlements Policy Paper No. 3 (Basel).

Kaminsky, Graciela L. and Carmen M. Reinhart, 1999, "The Twin Crises: The Causes of Banking and Balance-of-Payments Problems," *The American Economic Review*; Vol. 89:3, pp. 473–500, June.

Kaminsky, Graciela L. and Sergio L., Schmukler, 1999, "What Triggers Market Jitters? A Chronicle of the Asian Crisis," International Finance Discussion Papers, No. 634, April.

Kim, Se-Jik, 1999, "Bailout and Conglomeration," IMF Working Paper No. 99/108 (Washington: International Monetary Fund).

Kim, Se-Jik and Mark R. Stone, 1999, "Corporate Leverage and Output Adjustment in Post-Crisis East Asia," IMF Working Paper No. 99/143 (Washington: International Monetary Fund).

Kochhar, Kalpana, Prakash Loungani, and Mark R. Stone, 1998, "The East Asian Crisis: Macroeconomic Developments and Policy Lessons," IMF Working Paper No. 98/128 (Washington: International Monetary Fund).

Krugman, Paul, "A Model of Balance-of-Payments Crises," *Journal of Money, Credit, and Banking*, August 1979, Vol. 11 (3), pp. 311–25.

_____, 1998, "What Happened to Asia?," available via the Internet at web.mit.edu/krugman/www/DISINTER.html, January.

_____, 1999a, "Balance Sheets, Financial Crises, and the Transfer Problem," available via the Internet at web.mit.edu/krugman/www/DISINTER.html, January.

_____, 1999b, "Analytical Afterthoughts on the Asian Crisis," available via the Internet at web.mit.edu/krugman/www/MINICRIS.htm, September.

Kwon, Jae-Jung and Joo-Ha Nam, "Distressed Corporate Debts in Korea", Korea Institute for International Economic Policy Working Paper No. 99–11, April.

Lane, Timothy, Atish R. Ghosh, Javier Hamann, Steven Phillips, Marianne Schulze-Ghattas, and Tsidi Tsikata, 1999, "IMF-Supported Programs in Indonesia, Korea, and Thailand: A Preliminary Assessment," IMF Occasional Paper No. 178 (Washington: International Monetary Fund).

Lopez-Mejia, Alejandro, 1999, "Large Capital Flows – A Survey of the Causes, Consequences, and Policy Responses," IMF Working Paper No. 99/17 (Washington: International Monetary Fund).

Lubrano, Michael, 1996, "Practical Difficulties in Mexican Workouts and Bankruptcies," *North American Corporate Lawyer*, Vol. III, No. 3.

Masson, Paul, 1998, "Contagion: Monsoonal Effects, Spillovers, and Jumps Between Multiple Equilibria," IMF Working Paper No. 98/142 (Washington: International Monetary Fund).

Mishkin, Frederic S., 1997, "The Causes and Propagation of Financial Instability: Lessons for Policymakers," in *Maintaining Financial Stability in a Global Economy: A Symposium*, U.S. Federal Reserve Bank of Kansas City, August.

Natalucci, Fabio, 1999, "Is There Evidence of a Financial Accelerator Mechanism in the Asian Crisis,?" mimeo.

Pyo, Hak, 1999, "Excess Competition, Moral Hazard, and Industrial Trauma in Korea (1997–98)" in *The Aftermath of the Asian Crisis*, D. Dasgupta, U. Dadush and M. Uzan, eds., Edward Elgar Publishing.

Rodrik, Dani, 1996, "Understanding Economic Policy Reform", *Journal of Economic Literature*, Vol. 34, pp. 9–41, March.

Roubini, Nouriel, Giancarlo Corsetti and Paolo Pesenti, 1998, "What Caused the Asian Currency and Financial Crisis?," available via the Internet at www.stern.nyu.edu/~nroubini/asia/AsiaHomepage.

Sachs, Jeffrey and Steve Radelet, 1998, "The Onset of the East Asian Financial Crisis," mimeo, Harvard Institute for International Development (Boston).

Stone, Mark R., 1998, "Corporate Debt Restructuring in East Asia: Some Lessons from International Experience," IMF Paper on Policy Analysis and Assessment, No. 98/13 (Washington: International Monetary Fund).

Stone, Mark R., 2000, "Large-Scale Post-Crisis Corporate Restructuring," IMF Working Paper (Washington: International Monetary Fund).

Sundararajan, V., and Tomás J.T. Baliño, 1991, *Banking Crises: Cases and Issues* (Washington: International Monetary Fund).

Velasco, Andres, 1987, "Financial Crises and Balance of Payments Crises: A Simple Model of the Southern Cone Experience," *Journal of Development Economics*, October, Vol.. 27 (1–2), pp. 263–83.

_____, 1991, "Liberalization, Crisis, Intervention: the Chilean Financial System, 1975–1985," in *Banking Crises: Cases and Issues*, ed. by Vasudevan Sundararajan and Tomás J.T. Baliño (Washington: International Monetary Fund).

Wijnbergen, Sweder van, 1992, "Enterprise Reform in Eastern Europe," Discussion Paper Series, No. 738 (November), pp. 1–36 (London: Centre for Economic Policy Research).

_____, 1994, "On the Role of Banks in Enterprise Restructuring: the Polish Example," Discussion Paper Series, No. 898 (February), pp. 1–26 (London: Centre for Economic Policy Research).

_____, 1998, "Bank Restructuring and Enterprise Reform," European Bank for Reconstruction and Development Working Paper No. 29, June (London).

Woo, David, 2000, "Two Approaches to Resolving Nonperforming Assets During Financial Crises", IMF Working Paper WP/00/33 (Washington: International Monetary Fund).

World Bank, 1996, *World Development Report 1996: From Plan to Markets* (New York: Oxford University Press).

_____, 1999, "East Asia: The Road to Recovery."

_____, 2000, "East Asia: From Recovery to Sustained Growth, An Update, March."