BANKING ON CRISES:

EXPENSIVE LESSONS FROM RECENT

FINANCIAL CRISES

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ABSTRACT

What has caused the epidemic of financial crises in the last 2 decades of the 20th century, and what steps can be taken -- perhaps are being taken -- to minimize the vulnerability? This paper first summarizes both proximate and more fundamental factors behind financial crises, arguing that although a variety of proximate factors contribute to the explanation, information and incentive problems are the fundamental determinants. Second, a scoring system for the broad regulatory environment is developed for a dozen Asian and Latin American financial systems in 1997, and the Asian economies in crises are those with the poorest scores. Economies with high scores saw relatively little impact. The scoring system also provides a guide for how countries might prioritize improvements in their regulatory environment, though further research is needed to sort out more and less important factors. Third, the conclusion stresses that, given the information problems inherent in finance, regulatory environments that allow 'multiple eyes' to oversee finance should perform best.

BANKING ON CRISES: EXPENSIVE LESSONS

I. INTRODUCTION

Since the writings of John Stuart Mill, an illustrious group of economists have argued either that finance is unimportant or that it matters most when it gets out of order. As evidence of its neglect, generations of economists constructed models without money or a financial sector, and development texts, though routinely mentioning savings and investment, did not feature chapters on the financial system.[1] With the explosion of banking crises around the globe in the last two decades of the 20th century, finance is back in fashion. The turbulence and spread of financial crises in the East Asian 'miracle' economies -- and in Japan -- has raised concerns about the stability of financial systems in many countries, as well as inquiries as to the lessons of this experience. Authorities around the world are concerned about financial crises: how do they happen, why are there more and more costly crises, and what steps can be taken to minimize vulnerability.

This paper will address these issues. Section II will summarize briefly the voluminous literature on proximate and more distant causes of crises. Although both micro and macro factors are associated with crises, beyond lobbying for changes in the international financial system, national authorities are left with following sound macro policies, improving financial sector infrastructure, and upgrading regulation and supervision as means of minimizing the likelihood and

costs of financial crises. Is there a payoff to improving the regulatory framework? Tentative evidence presented in section III, which compares the broad regulatory environment in 12 selected Asian and Latin American countries, suggests that the answer is affirmative. This comparison both reveals how some countries have been progressing, in some cases beyond the BIS minimum standards, and can help as a guide, indicating weak areas of regulation that should be a target for further improvement. Generally, those countries that have higher scores on their regulatory systems appear to have weathered the latest crisis well, suggesting that improving the regulatory environment, broadly interpreted, should be a goal for countries that have not thus far made much headway in this area. The predominance of Asian countries at the bottom of the regulatory ranking (and the jump in interest rates there) provides another explanation of the mostly regional focus of the latest crisis. An added advantage of this scoring system is that it offers a game plan for the authorities in improving the regulatory environment.

A plausible hypothesis then is that authorities are learning -- at great cost -- from the last 2 decades of crises and are moving to raise the cost or otherwise tighten the safety net supporting the banking sector. Section IV will conclude with unresolved issues and suggestions for future research.

II. CRISES: CAUSES NEAR AND FAR

> "Panics do not destroy capital; they merely reveal the extent to which it has been previously destroyed by its betrayal into hopelessly unproductive works." John Stuart Mill, 1867.

The literature on banking crises has grown exponentially with the boom in bust banks in recent years. Indeed, the Asian crisis has spawned several websites, one of which lists, as of June 3, 1998, 43 pages of citations of research papers, country reports, news, and other websites with related information.[2] This section, after clarifying what we mean by crisis, briefly reviews some of the latest contribution to the literature on proximate causes of financial (here, mostly banking) crises, before turning to some of the fundamental causes. Understanding the proximate causes may help with predicting crises, but an understanding of the fundamental factors is necessary to help with their prevention.

Any review of the 'crisis' literature should commence with the warning that not all of the crises discussed are the same; a key issue thus is what constitutes a crisis. In the last few years, as economists have tried to model crises, there has been a tendency to distinguish two types: currency crises and financial crises. The former involve a sudden movement of the exchange rate and sharp change in capital flows. Financial crises regularly originate in or induce insolvency in the banking system, and feature a collapse in asset prices, most often in equity and securities markets. Banking system insolvency has various

manifestations, such as a run on the banks, large bailout programs or bank nationalization (Demirguc-Kunt and Detragiache, 1997) or a large nonperforming loan problem (Caprio and Klingebiel, 1997).

Still, these categorizations require some judgment for determining when a country is in a crisis of either type.[3] Either of these crises may be mild or severe. . But a financial crisis usually involves a corporate debt problem in the nonbank financial sector -- in other words, banks and other intermediaries usually do not get into trouble if borrowers can easily service their debt. Financial crises can occur without any currency crisis, as witnessed in many cases in Africa and in transition countries (though the crisis here, when no run was involved, was rather the insolvency of the banking system). Mild currency crises usually involve neither a corporate debt problem nor a banking crisis, as in the case of the 1992 ERM episode, whereas severe currency crises usually do trigger one or both. That is, severe currency crises usually entail a crisis in the banking and nonbank sectors.

This paper focuses on financial crises, regardless of whether a currency crisis is deemed to be involved.[4] A search for causes can be divided along two lines: more proximate causes, in the sense that they may provide indicators of incipient crises, and more distant, or fundamental factors. Demirguc-Kunt and Detragiache (1997, 1998) look at determinants in the former sense, using a

multivariate logit analysis of the likelihood of a banking crisis, based on the following indicators:

- macro (GDP growth, change in terms of trade, real interest rate, inflation, depreciation of the exchange rate, and government surplus/GDP);
- financial (M2/ foreign exchange reserves, credit growth/GDP, bank cash/bank assets, and private credit/GDP);[5] and
- institutional indicators (GDP per capita, the presence or absence of explicit deposit insurance, and in index of law and order, which is a proxy for the ability to enforce contracts).

This model, originally estimated up to 1994, performs quite well in prediction, explaining about 70% of the crises that occurred, and within sample only predicting a crisis when none occurred in 15% of the cases. Interestingly, in their research thus far, exchange rates or the terms of trade are not that significant in most specifications, though their original data did not include the Mexican and Asian crises. Slower output growth, increases in real interest rates, declining liquidity, faster credit growth, explicit deposit insurance, poor legal systems, and low per capita GDP are found to be associated with a greater likelihood of banking crises.

Previous research had debated whether macro or micro and institutional factors 'caused' banking crises, and Demirguc-Kunt and Detragiache reveal that both play a role in the drama, consistent with the finding of Caprio and Klingebiel

(1997) that out of 80 cases, both macro and micro factors regularly were cited as causes of systemic crises.[6] More recent attempts to explain crises have focused on the Asian episodes, which stand out in a number of respects, not least because the countries most directly involved -- Thailand, Indonesia, and Korea -- for several decades had seen such rapid growth of real incomes and living standards, and all appeared to have relatively favorable macro indicators, especially low inflation, fiscal balance or surpluses, and exceptionally high savings rates.[7] Krugman (1998) focuses on the links between moral hazard and overinvestment: implicit guarantees that governments would stand behind financial intermediaries led to investment based not on expected returns but on those likely in a 'Panglossian' state (best of all possible worlds). Cronyism, here interpreted to be close links between the government and the owner/managers of intermediaries, is featured in this explanation. Although applied to E. Asia in the 1990s, this description fits a number of other financial crises, including the U.S. Thrift institutions in the 1980s and, as Brad De Long has pointed out, the 1873 U.S. financial crisis (DeLong, 1998).

McKinnon and Pill (199 7, 1998) highlight the other side of this relationship, overborrowing, which occurs when the non-bank private sector becomes "...euphoric or triumphalist about the success of reform because of the overly optimistic implicit signal about macroeconomic developments contained in loose credit decisions (McKinnon and Pill, 1998, p. 14)." Both these explanations

are reminiscent of the debt-deflation literature (Fisher , 1936, Kindleberger, 1988, Minsky, 1982, and Bernanke, 1983), and in the East Asian context apply with particular force to Korea, which had debt-equity ratios in 1997 of 3, 4 or higher, depending on when measured, well above those of OECD countries. With such high ratios, firms are vulnerable to the slightest downturn in earnings, since most earnings are committed to paying interest on their debt. [8]

Certainly either version rings true. Excessively high leverage, a reliance on short-term debt, and property market bubbles were featured in E. Asia. Private credit grew substantially in excess of GDP throughout the 1990s, which is consistent with this hypothesis, but as Corsetti et al (1998) note, this explanation fits Thailand better than Korea and Indonesia. In Korea debt-equity ratios had been excessive for some time, making it difficult to highlight a period of demonstrably excessive growth. Consistent with (and encouraged by) the real exchange rate appreciation of their currencies, there was a sharp increase in investment in non-traded goods, especially construction. By 1997, it became clear that much of the new office space -- in Bangkok and Jakarta, capacity reached 5-8 times the level of the early 1990s -- was a misallocation of resourses. Indeed, the property boom appears to have collapsed well in advance of any foreign exchange panic, as property indexes on the stock exchange by the end of 1996 were off their peaks of 1993 in Indonesia (by about one-third) and Thailand

(by three-quarters). Property booms, of varying magnitudes, figured prominently in the Scandinavian, U.S., and Japanese crises, among others.

Radelet and Sachs (1998), again on the Asian crisis, argue that the panic by foreign investors caused the crisis, but given the warning signs of problems in the financial sector, including the declining property market, it is more likely that the panic exacerbated the problem. In other words, John Stuart Mill (above) was only partly right: panics both reveal pre-existing resource misallocation and, to the extent that asset markets overshoot, can significantly deepen the crisis as well. Corsetti, Pesenti, and Roubini (1998) argue that the crisis occurred because investors became aware of the fundamental problems about banking and corporate debt. In this regard, Burnside et al (1998) develop a model in which a currency crisis can be caused by foreigners awakening to the fiscal costs of the financial sector crisis; that is, even if stated fiscal positions are in balance or surplus, the actual position, when there are large contingent liabilities of the banking sector, can be in large deficit. This approach admits the possibility of self-fulfilling crises: if the market decides that banks are weak and run the currency, banks with direct (on balance sheet) or indirect foreign exchange exposure (on their customers' balance sheets) can be rendered insolvent. Thus a panic by investors might be rational or irrational. In addition, the Asian crisis featured a number of policy errors that compounded what might have been a smaller crisis (Corsetti, et al.).

Lastly, not just related to East Asia but on financial crises more generally, Stiglitz (1998) and Demirguc-Kunt-Detragiache (1998) note the role played by premature financial sector liberalization, especially where existing institutions -- regulation, supervision, and other parts of the infrastructure that would support incentive-compatible behavior -- are absent. This view stresses the need for sensible pacing and sequencing of financial reforms.

MORE FUNDAMENTAL FACTORS BEHIND CRISES

The debate among most of the aforementioned authors on the prime cause of the crisis is interesting, but those searching for a single cause of crises miss or at least de-emphasize, a key point, namely that multiple factors were featured most of the time. Thus, of the 86 episodes of bank insolvency (1980-94) in the Caprio-Klingebiel dataset, at least 20 of these featured 'cronyism,' meaning excessive political interference, connected lending, or similar labels, and at least 30 featured overborrowing. Panics by foreign investors played a role in Latin American crises of the 1980s and in East Asia in the 1990s, and premature liberalization could be cited in virtually all cases. And of course, macro factors are common factors in bank insolvency, especially terms of trade declines or recessions.

But rather than emphasize these proximate factors, it is helpful to realize that crises are manifestations of deeper characteristics of the financial sector, which make it prone to such events. Indeed, as Rodrik (1998) has noted, it is

distressing that whenever crises occur the economics profession tends to come up with a new generation model to explain the events, only to find that the next crises do not fit the model. Focusing on more proximate factors makes this continual chase almost inevitable.

Instead, it is useful to consider the fundamental characteristics of finance: information asymmetries, intertemporal trade, and (some) demandable debt. Providers of funds have difficulties monitoring intermediaries, who in turn face the same problem with users of funds. Those receiving funds know better how they will utilize them than the providers, while the exchange of money today for money in the future further complicates the monitoring problem. This information asymmetry affects bank owners, market participants -- depositors and other creditors -- and bank supervisors. [9] Thus most bank loans are illiquid and not easily marked to market, making banking, with demandable debt, especially vulnerable to a revaluation of expectations and contributing to its inherent fragility.[10] Indeed, this feature of banking makes it particularly susceptible to multiple equilibria.

Information asymmetries and intertemporal trade foster incentive problems in finance. Bank managers in a perfect information world would find it more difficult to take risks in excess of shareholders' comfort level, and supervisors could intervene in time if they always knew the true net worth of banks.[11] Thus looting, gambling for resurrection or Ponzi schemes could not

occur with perfect information and any reasonable form of corporate governance. Information and incentive problems worsen during the crisis itself, as markets may not distinguish between better and worse banks, and asset prices, which may have been inflated before the crisis, can overshoot their equilibrium level as investors rush for the door.

While countries are in a 'good' equilibrium, it is perhaps understandable that authorities are not disposed to deal with the weaknesses in their financial systems, even though this is likely the best time to do so. Once the economy slips into crisis -- the bad equilibrium -- it is likely easier to muster political support for reform, though the long delays in responding in the United States and Japan, among other countries, suggest that the process is neither automatic nor necessarily rapid.

III. BANK REGULATION AND OPERATING ENVIRONMENT

In response to the wave of banking crises of the last two decades, authorities in some countries have begun raising the cost and limiting the extent of the safety net supplied to banks. Enacting and tightening the regulations that banks confront is a key way to achieve this goal, and cross-country comparisons of bank regulation can help reveal the relative strengths and weakness of the operating environment for banks, as well as keep track of progress made in this respect. Yet

it is difficult to compare regulatory environments, much less the way in which the regulations are supervised. This section attempts the former task, comparing bank regulation, adapted from the CAMEL framework employed by bank supervisors, variations of which have been used for this purpose by *JP Morgan* (1997) and Ramos (1997) precisely for rating regulations. [12] Just as individual banks can be assessed by their capital, asset quality, management, earnings, and liquidity, regulatory systems can be compared by using similar criteria, assessing not how these measures compare for all the banks in a country, but rather how the country's requirements and overall environment compares with those of others. Unfortunately, data needed to do these assessments were readily available only for a dozen E. Asian and Latin American countries, but a current World Bank research project is extending this information to a wider variety of countries and also quantifying some supervisory variables.

Capital here is assessed here by the minimum required capital-asset ratio, as well as its definition; the more restrictive the allowances for recognizing asset revaluations as part of capital, or the more that risk taking is explicitly accounted for in constituting minimum ratios, the higher the ranking. Asset quality is proxied by the definition of non-performing loans -- the number of days till a loan becomes nonperforming -- and the provisioning required once this judgment is made. Management quality is the most difficult to compare, but the arbitrary assumption made here is that countries with more assets in foreign banks enjoy

better managed assets; foreign ownership also brings better diversification. Management quality could be regarded as separate from regulation, but is included in an index of the regulatory environment as indicating the types of owners that are allowed into the industry. [13] Earnings are not included, as they relate only partly to regulations or the environment, but more to cyclical considerations (as well as to accounting conventions). Minimum liquidity requirements, the inclusion of foreign exchange as a separate reason for liquidity, and the extent of its remuneration are included in the liquidity indicator. [14]

The environment in which banks function is affected by their operating environment and the degree of transparency, which here are included as part of the broad regulatory environment. The overall operating environment is proxied by measures of property rights (the poorer these are defined, the more difficult it becomes to secure credit), creditors' rights, which indicate the ability of creditors to secure repayment, and a measure of the enforcement of the laws (LaPorta et al, 1998, and Levine, 1998). Finally, transparency is perhaps the most difficult to gauge. The ranking here is based on whether bank ratings are required, the number of top 10 banks with ratings from international firms (judged to be superior in emerging markets to local counterparts and less susceptible to corruption), and an index of corruption. The latter is included because the greater the extent of corruption, the less likely it is that disclosed information will be accurate.[15] Appendix A contains the details behind each category.

Several caveats are in order. These measures are as of late 1997, before most of the crisis countries made any significant changes in their regulations, however, the components of the operating environment and the corruption index (part of the transparency measure) are from the early 1990s. Since the latter variables only change slowly, this lag is not likely be a significant drawback. Most importantly, *each category is equally weighted*, clearly an arbitrary rule of thumb. Each category has its proponents: some argue that management is key, others that loan classification and provisioning matters most, and in the wake of the Asian crisis, transparency is receiving a much emphasis. Or, proponents of narrow evaluations of regulations alone would prefer to include only capital, assets, and liquidity, which would change the rankings somewhat, as noted below. Only further research, once a broader dataset is available, will possibly settle this issue. Although capital standards, liquidity ratios, and the share of (majority owned) foreign banks in total assets admit to relatively straightforward measurement, with some scope for interpretations of definitions, the other variables are more difficult to measure. Lastly, until data on or proxies for supervisory effort become available, it is not possible to determine how the regulations are enforced. With these caveats, Table 1 shows the overall 'CAMELOT' rankings, with lower numbers indicating a higher rating.

As indicated by the shadings, several clusters of economies stand out, with Singapore showing the strongest regulatory environment, followed in the order

shown in the Table. The groupings are highlighted due to the close scores in several categories and because it is unlikely that differences in total scores of a few points will be significant. Also, the rankings may understate the present health of various systems; for example, in Hong Kong, official regulations do not require a given amount of provisioning even once a loan is in arrears by 180 days (hence a lower score here), yet the authorities encourage provisioning, and Hong Kong Shanghai Bank, a very large part of the 'Hong Kong' banking system, may have much stricter standards and a first-rate market and credit risk management system. Still, the comparison in Table 1 is on bank regulation systems, which may only correspond to the health of the banks in the long run. Also, note that some countries, such as Peru, the Philippines and Colombia, score quite well on narrow CAMEL criteria, but have a lower ranking due to their relatively lower scores on the operating environment and transparency.

These regulatory environment rankings are potentially useful for several purposes. First, for the authorities in each country they show areas in which improvements are more important. For example, authorities in the Philippines might find efforts to improve the legal system and transparency, where they have a low score, to be of higher priority than encouraging more foreign bank entry, the latter already being a strength. And Colombian authorities apparently do not need to make improvements in capital or loan classification, but other criteria would appear to need attention. Again, however, it is important to note that these

recommendations assume that further research -- only possible once a broader database is available -- bears out the importance of these criteria. Also, the ratings should not be used as simple 'minimum standards,' in that they are no substitute for the commitment of the political and financial elite of a country to avoid the costs of bad banking. Rather, these ratings could be used as a tool by an already committed elite to effect change in their banking system.

Second, it should be no surprise when econ omies with low scores are hit by crises. Those at the top or middle of the range in Table 1, which may have tighter regulations either because they experienced crises in the 1980s (Argentina, Chile, Hong Kong) or due to concerns about the vulnerability associated with being small, highly open economies (Hong Kong, Singapore), tend to have been less affected by the recent crisis. By early 1998, interest rates in a variety of emerging markets had risen significantly (Table 2), as did the rates at which they borrowed in international markets. As seen in Figure 1, domestic interest rates between the end of 1996 and the spring of 1998 have widened most for economies with the weakest (that is, highest) regulatory scores, though to be sure with only a dozen observations the sample is insufficient for more formal testing. [16] Still, an evaluation of bank regulation may help in understanding the vulnerabilities of financial systems. Strengthening the regulatory environment likely pays off: thus, Argentina was more seriously affected in the wake of the Tequila crisis than by the Asian 'flu,' having in the meantime substantially strengthened capital

regulations and loan classification procedures, allowed the percentage of foreign banks to rise significantly, and markedly improved transparency.

Third, in the emerging debate on contagion, some effort is being devoted to explaining why the Mexican and Asian crises appeared to be largely regional. This literature almost exclusively focuses on 'real' sector explanations (Diwan and Hoekman, 1998; Glick and Rose, 1998), an approach that fits particularly well in Asia, where trade links are larger than in other emerging market regions. Another explanation, by no means mutually exclusive, is that shocks or dislocations come along regularly, and those countries that are the most susceptible to a significant financial crisis are those in which the incentive and information systems are the weakest. This view also helps explain why Singapore and Hong Kong, both with strong real sector links in the E. Asian region, were less affected by the crisis.

IV. CRISIS LESSONS

What lessons can be learned from the crises of the last two decades? The main candidates for explaining the boom in bank failures and the unprecedented fiscal cost of these episodes are that:

- with the demise of colonialism and rise of nation-states, there has been more local banking -- more countries attempting to have banks that specialize in

lending to the home market, leading to greater bank fragility and more banks to fail;

- macro volatility, post-Bretton-Woods, has increased or shocks are transmitted more readily; and/or
- government safety nets are encouraging greater moral hazard, without commensurate improvements in the information and incentive environment.

Although the first factor likely matters, it is not plausible that it alone explains the phenomenal surge in systemic banking problems. Also, while it is evident that interest rate and exchange rate volatility and capital mobility are greater in the 1980s and 1990s than during the Bretton Woods period, the same statement would not be true for a comparison with the nineteenth and early twentieth century, particularly if real interest rates and real GDP volatility were compared. Moreover, the work of Demirguc-Kunt and Detragiache shows that macro factors alone do not explain banking crises. Thus the third factor likely plays an important role in this story.

Correcting information and incentive problems then stands out as a key area for national authorities' attention, and some tentative evidence was presented suggesting that those economies with the most conservative regulatory environment have best weathered crises. Once more systematic information is available to score a wider variety of regulatory and supervisory systems , this tentative evidence can be subjected to more formal econometric testing.

Although improving information should be a clear goal, authorities need to realize that they will never eliminate information asymmetries -- or financial crises! Even the best information environments have banking crises -- notwithstanding the views of some Texans, this state in the 1980s was part of the United States, and shared its accounting, auditing, and corporate governance systems.

Given the natu re of information problems, having bank surveillance by 'multiple eyes' is a recommended approach, meaning that owners, markets, and supervisors all need to be given clear incentives and information to monitor banks. Merely increasing capital ratios in the hope that it will induce better bank performance may not be successful: the quality of bank capital, and of bank balance sheets, is difficult to monitor, and higher required capital ratios could induce more risk taking (Hellmann, Murdoch, and Stiglitz, 1997, and Berger et al, 1995). In Argentina, the required capital ratio most clearly is a function of the risks being taken: banks are required to have higher minimum ratios the lower their individual CAMEL rating, the more they lend in excess of 200 basis points above prime rates, and the greater the market risks they undertake. Also, with the requirement that banks issue subordinated debt, there is now the ability to use both market and supervisory input in making decisions as to their riskiness. Moving to forward-looking risk models as a way to ensure better behavior among bankers should be effective but only if significant penalties are assessed when bankers violate the assumptions of their risk models. Making sure that there are

some uninsured debt holders in the market will help with monitoring from this source.

Owners of banks also can be motivated by increasing their franchise value, such as through limiting entry. Both U.S. and Japanese banks got into difficulties after several decades of declining franchise value (Weisbrod, Lee, and Rojas-Suarez, 1993; Keeley, 1990). But enforcing entry limits will be difficult in higher income economies given that nonbanks can start up banking functions at low cost.

Lastly, supervisors also need incentives . In many countries there are disincentives to monitor when: supervisory agencies have little political independence, pay is a fraction of that in the industry being supervised, supervisors face personal legal liability for their official actions, and former supervisors are allowed to take jobs in banking, in effect raising the possibility that they enjoy deferred compensation for not doing their job well. Calomiris (1997) has documented well examples from the nineteenth century, when deferred compensation for supervisors was used to induce effective supervision, and Kane (1997) actively makes a case for a 'bonded regulator,' arguing that least-cost supervision will not be attained until supervisors are given better incentives.

Governments are not moving significantly on this last point, but instead there is growing support for requiring 'prompt, corrective action' as a way to ensure that supervisors act in a timely fashion. Unfortunately, these rules can be re-written in times of crisis (Caprio, 1997), and whether such rules are more or

less likely to be overturned than a bonded regulator is an unresolved issue. Still, the fact that a number of both high and middle income countries are making improvements in the information and incentive environment in banking suggests, that after some of the costliest financial crises in history, authorities are learning. To the extent that authorities raise the cost or limit the coverage of the safety net for banking, fewer banking crises may be expected. However, with a more limited or more expensive safety net, the nonbank industry will grow rapidly, as it has in Argentina in the last 2 years, in part to escape the costs.

As the Thai authorities discovered most recently, nonbank finance company problems can infect the banking sector, and a cardinal rule of financial regulation should be that all institutions that take deposits and make loans, regardless of what they are called, should be regulated as banks. The challenge for authorities, then, will be to ensure that financial intermediation, wherever it occurs, is well (not over-) regulated. With an improved regulatory environment, governments can more realistically expect that financial intermediation will be more likely to absorb, rather than magnify, shocks.

Appendix A. Components of the CAMELOT Ratings for Banking System Regulation.[17]

Capital

Country	Definition	Minimum Ratio	Ranking
Singapore	Only Tier 1 eligible	12	1
Argentina	Capital ratio geared to CAMEL rating and interest rates; capital req. for market risk added, with bonds of duration over 2.5 years requiring higher capital	11.5	1
Hong Kong	70% of revaluation reserves eligible for inclusion. Minimum can be raised up to 12% for licensed banks, 16% for restricted license or deposit-taking company; institutions required to observe a 'trigger' 1% above the minimum. Capital requirement for market risk as of late-97.	8	3
Chile	Only LT sub debt, up to 20% of capital; risk weight for mortgages above Basle norm.	8	5
Brazil	Reval. reserves, loss reserves, included tier 2	8	7
Peru	No revaluation accounts, sub. debt permitted; min. capital ratio raised by 150-200% for overdue loans.	8	5
Malaysia	Only tier 1 in 8%	8	5
Colombia	150 % risk weight for loans, only 50% of revaluation assets.	9	3
Korea	Up to 45% of revaluation gains included in tier 2 capital	8	7
Philippines	No tier 2, unweighted (all at 100%)	10	4
Thailand	Tier 2 includes revaluation accounts, provisions, unrealized securities profit/loss, subordinated debt	8.5	7
Indonesia	Sub. debt up to 50%,	8	7

Loan Classification

Country	Days to NPL status	Min. initial provision*	Comments	Ranking
Singapore	sub. risk	loan value-.8*collateral (50% min.)		6
Argentina	90	25%	1% provision on normal loans, Max. single, 15%	4
Hong Kong	180	no general rule	Max. single, 25%	9
Chile	30/90	60%/n.a.		1
Brazil	60	100		3
Peru	60/90	50-60%		2
Malaysia	180	0/1% gen. provisions		9
Colombia	90	50%		4
Korea	180	20%		9
Philippines	sub. risk	25%		6
Thailand	360	15%		11
Indonesia	90	10%		8

* On unsecured balances.

Management (Foreign Ownership)

Country	% of assets in foreign banks	Rank
Singapore	61.6	2
Argentina	42.9	3
Hong Kong	65.6	1
Chile	33.1	4
Brazil	33.6	4
Peru	28.0	6
Malaysia	14.6	8
Colombia	5.3	11
Korea	8.0	10
Philippines	15.0	7
Thailand	1.8	12
Indonesia	10.8	9

Liquidity

Country	Ratio(s)	Forex	Remuneration	Ranking
Singapore	24%	Watched closely		5
Argentina	20% on liabilities up to 89 days, 15% for 90-179; 10% for 180-365; and 0 for over 365 days. Approx. 9.7% additional as Repos.	Watched closely	Mostly remunerated, half offshore	4
Hong Kong	25% of liabilities	Watched closely	Mostly remunerated	2
Chile	9% on demand, 3.6% on time			8
Brazil	78/15/20			3
Peru	9%	36% added required	Mostly dollar deposits, so 45%	1
Malaysia	13.5%	No restrictions		8
Colombia	21%, 10%			6
Korea	5% on demand, 2% on time			11
Philippines	13%			7
Thailand	7%			8
Indonesia	3%			12

Note that in ranking for operating environment, those with a "1" on property rights, get ranked first (hence a 4-way tie) ; those with a 2.5 get a 5 (2-way tie), and those with a 2 come next, etc. Creditors' rights are ranked in the same manner (except that ratings range from a low of -2 to a high of 1, and enforcement of the legal system is ranked linearly from the high of Singapore to the low of the Philippines.

Operating Environment

Country	**Property Rights***	**Creditor Rights****	**Enforcement****	**Ranking**
Singapore	1	1	8.715	1
Argentina	2	-1	5.13	7
Hong Kong	1	1	8.52	2
Chile	1	-1	6.91	5
Brazil	3+	-2	6.31	8
Peru	3	-2	3.59	11
Malaysia	2	1	7.105	3
Colombia	3	-2	4.55	10
Korea	1	1	6.97	3
Philippines	2	-2	3.765	11
Thailand	2.5	1	6.91	6
Indonesia	2.5	1	5.035	8

*1998 Index of Economic Freedom ..
** Levine (1997) and La Porta, Lopez de Silanes, Shleifer and Vishny (1997).

For transparency, those countries requiring banks to be rated get a 1, those without this requirement get a 0; the number of top 10 banks and the corruption measure are ranked as above, and rankings then totaled in the same manner, with the lowest score getting a first place, etc.

Transparency

Country	**Bank Rating Required***	**Top 10 Banks with Int'l Ratings***	**Corruption****	**Ranking**
Singapore	No	All	8.22	1
Argentina	Yes	10	6.02	2
Hong Kong	No	3	8.52	4
Chile	Yes, 2	10	5.3	2
Brazil	No	9	6.32	5
Peru	Yes	6	4.7	10
Malaysia	No	2	7.38	8
Colombia	No	5	5.0	10
Korea	No	10	5.3	5
Philippines	No	8	2.92	12
Thailand	No	9	5.18	7
Indonesia	No	10	2.15	8

*BIS Annual Report, 1997, and World Bank data
** Laporta, et. al.

REFERENCES

Bernanke, Ben, 1983. " Nonmonetary Effects of the Financial Crisis in the Propagation of the Great Depression," American Economic Review , vol. 73, no. 3, June.

Berger, Allan, 1995. "The Relationship between Capital and Earnings in Banking," JMCB, 27, pp 432-56.

Burnside, Craig, Martin Eichenbaum, and Sergio Rebelo, 1998. "Prospective Deficits and the Asian Currency Crises," mimeo, The World Bank.

Calomiris, Charles, 1997. *The Post-Modern Bank Safety Net: Lessons for Developed and Developing Countries,* AEI Press: Washington, D.C.

Caprio, Gerard, Jr., 1997. "Safe and Sound Banking in Developing Countries: We're Not in Kansas Anymore," World Bank Policy Research Working Paper 1739, March 1997, and in *FDICIA: Bank Reform Five Years Later and Five Years Ahead, JAI Press*, 1997.

Caprio, Gerard, Jr. and Daniela Klingebiel, 1997. "Bank Insolvency: Bad Luck, Bad Policy, and Bad Banking," in Michael Bruno and Boris Pleskovic, eds ., *Annual Bank Conference on Development Economics 1996*, The World Bank.

Corsetti, Giancarlo, Paolo Pesenti, and Nouriel Roubini, 1998. "What Caused the Asian Currency and Financial Crisis," Paper presented at the CEPR/World Bank Conference, May 8-9, London.

DeLong, Brad, 1998. "Asia's Flu: A History Lesson," mimeo, Jan. 11, http://econ161.berkeley.edu/.

Diwan, Ishac, and Bernard Hoekman, 1998. "Financial Crises: Contagion and Market Volatility," paper presented at the CEPR/World Bank Conference, London, May 8-9.

Demirguc-Kunt, Asli and Enrica Detragiache, 1997. "The Determinants of Banking Crises: Evidence from Industrial and Developing Countries, World Bank Policy Research Working Paper 1828, September, www.worldbank.org/html/prddr/prdhome/IBNNewsletter.htm.

_____, 1998. "Financial Liberalization and Financial Fragility," paper presented at the April 1998 Annual Bank Conference on Development Economics, The World Bank, www.worldbank.org/html/prddr/prdhome/IBNNewsletter.htm.

Fisher, Irving, 1997. *The works of Irving Fisher: Vol. 10. Booms and depressions and related writings,* London: Pickering and Chatto.

Glick, Reuven, and Andrew Rose, 1998. Contagion and Trade: Why are Currency Crises Regional?" Paper presented at the CEPR/World Bank Conference, May 8-9, London.

Goldstein, Morris, 1998. *The Asian Financial Crisis: Causes, Cures, and Systemic Implications,* Institute for International Economics: Washington, D.C. June.

Hong Kong Monetary Authority, 1997. *Prudential Supervision in Hong Kong*, December.

International Monetary Fund, 1997. *International Capital Markets: Developments, Prospects, and Key Policy Issues,* Appendix 2. International Monetary Fund: Washington, D.C.

J.P. Morgan, 1997. "Latin American Banks: How Conservative Regulations Help Create Profits," in JP Morgan *Equity Research*, January 22.

Kane, Edward, 1997. "Comment on Understanding Financial Crises: A Developing Country Perspective, in Michael Bruno and Boris Pleskovic, eds ., *Annual Bank Conference on Development Economics 1996*, The World Bank.

Keeley, Michael C., 1990. "Deposit Insurance, Risk, and Market Power in Banking," American Economic Review , vol. 80, no 5.

Kindleberger, Charles Poor, 1978. Manias, Panics, and Crashes: A History of Financial Crises, Basic Books.

Krugman, Paul, 1998 "What happened to Asia," mimeo , January.

Kaminsky, Graciela L., and Carmen M. Reinhart, 1996. "The Twin Crises: The Causes of Banking and Balance of Payments Problems, " mimeo, Board of Governors of the Federal Reserve System and University of Maryland, September.

LaPorta, Rafael, Florencio Lopez-do-Silanes, Andrei Shleifer, and Robert W. Vishny, 1998. "Law and Finance," forthcoming, *Journal of Political Economy*.

Levine, Ross, Norman Loayza, and Thorsten Beck, 1998. "Financial Intermediation and Growth: Causality and Causes," mimeo, The World Bank, April.

McKinnon, Ronald and Huw Pill, 1998. "International Overborrowing: A Decomposition of Credit and Currency Risks," mimeo, Stanford University, February.

Minsky, Hyman P., 1982. Can 'It' Happen Again: Essays on Instability and Finance, M.E. Sharpe.

Mishkin, Frederic S., 1997. Understanding Financial Crises: A Developing Country Perspective, in Michael Bruno and Boris Pleskovic, eds ., *Annual Bank Conference on Development Economics 1996*, The World Bank.

Peek and Rosengren (1997), "Collateral Damage: Effects of the Japanese Real Estate Collapse on Credit Availability and Real Activity in the United States," mimeo, Federal Reserve Bank of Boston.

Radelet, Steven, and Jeffrey Sachs, 1998. "The Onset of the East Asian Financial Crisis," Harvard Institute for International Development, mimeo, February.

Ramos, Roy, 1997. "A Comparison of Prudential Norms Across Asia and in the U.S. Using the CAMELOT Framework," in Goldman Sachs Asia Banking Research, January 8.

Stiglitz, Joseph, 1998. "Sound Finance and Sustainable Development in Asia: Keynote Address to the Asia Development Forum," mimeo, The World Bank, March 12. Available at: http://www.worldbank.org/html/extdr/extme/speech.html .

Weisbrod, Steven, Howard Lee, and Liliana Rojas-Suarez, 1993. "Bank Risk and the Declining Franchise Value of the Banking Systems in the United States and Japan," IMF Working Paper 92/45, International Monetary Fund, Washington, D.C.

Wyplosz, Charles, 1998. Globalized Financial Markets and Financial Crises," mimeo, Graduate Institute of International Studies, Geneva, April.

World Bank, 1998. *Global Development Finance*, The World Bank: Washington, D.C.

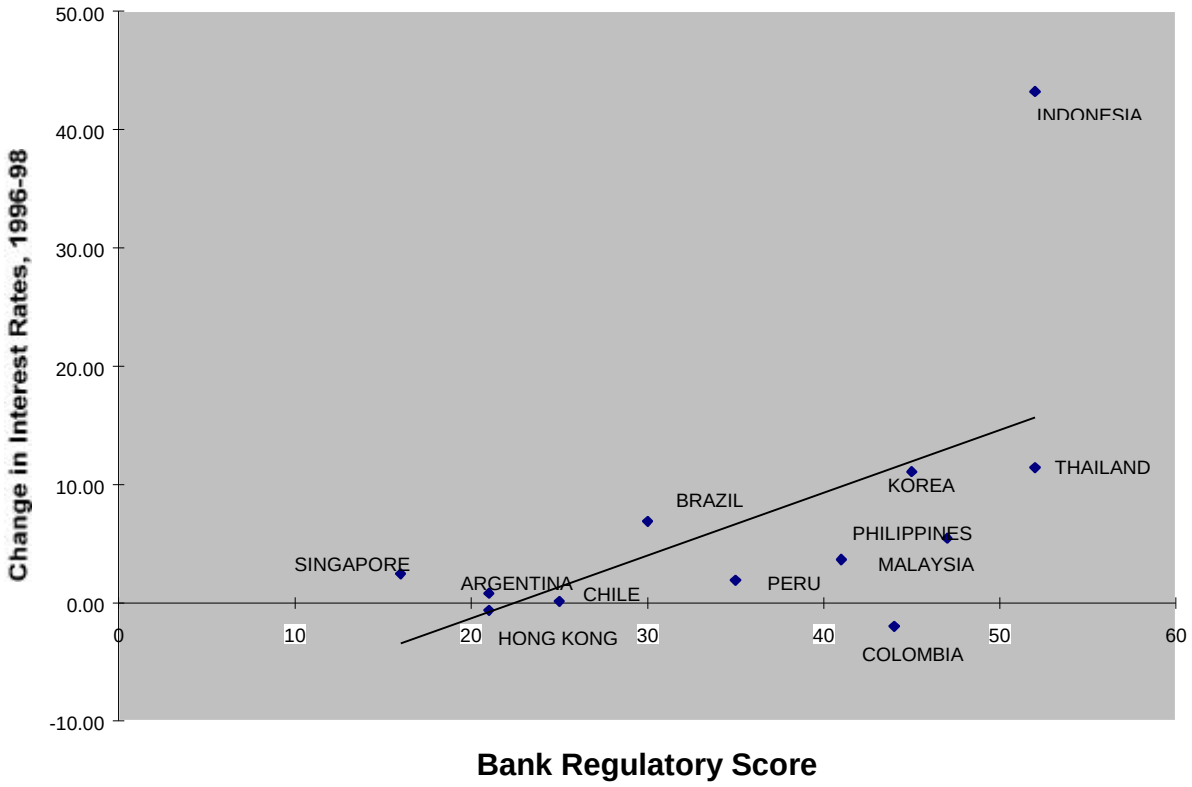
Table 1. Summary Measures of the Bank Regulatory Environment

Country	Total Score	Capital Position	Loan Classification	Foreign Ownership (Management)	Liquidity	Operating Environment
Singapore	16	1	6	2	5	1
Argentina	21	1	4	3	4	7
Hong Kong	21	3	9	1	2	2
Chile	25	5	1	4	8	5
Brazil	30	7	3	4	3	8
Peru	35	5	2	6	1	11
Malaysia	41	5	9	8	8	3
Colombia	44	3	4	11	6	10
Korea	45	7	9	10	11	3
Philippines	47	4	6	7	7	11
Thailand	52	7	12	12	8	6
Indonesia	52	7	8	9	12	8

Table 2. Money Market Interest Rates

Country	1995	1996	1997	Latest 1998	Change Dec. 96 to Spring 1998	Regulat
Singapore	2.56	2.93	4.35	5.38	2.45	1
Argentina	9.46	6.23	6.63	7.02	0.79	2
Hong Kong	6.00	5.13	4.50	4.50	-0.63	2
Chile	15.7	14.03	13.49	14.16	0.13	2
Brazil	53.37	27.45	25.00	34.32	6.87	3
Peru	16.3	13.9	11.7	15.8	1.90	3
Malaysia	na	7.30	10.32	10.95	3.65	4
Colombia	22.40	28.37	23.83	26.38	-1.99	4
Korea	12.57	12.44	13.24	23.53	11.09	4
Philippines	11.76	12.34	12.89	17.79	5.45	4
Thailand	10.27	9.16	na	20.57	11.41	5
Indonesia	13.64	13.96	27.82	57.18	43.22	5

Figure 1. Bank Regulatory Environment and Interest Rates



ENDNOTES

[1] I am indebted to Ross Levine for the point on development texts.

[2] The web page is Nouriel Roubini's at www.stern.nyu.edu/~nroubini/asia/AsiaHomepage.html. Paul Krugman, in an observation on the extensive nature of this website, raised the question of whether Roubini 'had a day job.' For discussions of the Asian crisis, see in particular The World Bank, 1998 ; Krugman 1998, Goldstein, 1998, and Corsetti, Pesenti, and Roubini, 1998.

[3] That it, it is not clear what constitutes a 'sudden' move of the exchange rate, a sharp change in capital flows, when a bank run is systemic (or merely represents a flow of deposits from weak banks to strong ones), etc.

[4] In the Kaminsky-Reinhart (1996) database, in 38 cases there was an exchange rate crisis without a banking crisis. The time from a banking crisis to an exchange rate crisis was minus (that is, the banking crisis led the exchange rate crisis by) 5 years to plus six years (if one omits the plus 14-15 year cases!).

[5] Since thus far there are no comparable data cross-country on domestic private debt or debt equity ratios, the model could not include such indicators.

[6] They found that terms of trade shocks, recessions, or credit booms, on the macro side , and deficient management, faulty supervision and regulation, government intervention, or some degree of connected or politically motivated lending , on the micro side, were cited as causes of most systemic crises.

[7] Yet macro indicators were not uniformly strong. Thailand, Indonesia, and Korea all lost some competitiveness from the Chinese devaluation of 1994 and the slide of the yen in 1996-97; by the end of 1996, the real exchange rate in Indonesia, Malaysia, and Thailand had appreciated by 30-40% since the early 1990s. Thailand in particular kept its exchange rate fixed and interest rates above international levels since the early 1990s; given the boom in domestic credit, only rising fiscal surpluses would have been consistent with the pegged exchange rate. The problem, of course, was that capital inflows continued regardless of this inconsistency.

[8] With high debt equity ratios, raising interest rates will only worsen insolvency. The only solutions are: injecting equity (unlikely in crisis environments), reducing the real value of debt through higher inflation, or a debt-equity swap, which means wiping out existing equity holders and telling (some) debt holders that they now have an equity claim.

[9] Mishkin (1997) and Wyplosz (1998) elaborate on these information problems.

[10] When a sufficient information becomes available on a firm so that its credit can be easily priced, the firm graduates to direct market finance. Information technology may reduce the cost of disseminating information on firms, but small and medium-size firms still rely on banks for most of their credit, even in industrial economies.

[11] In fact, with perfect information, there would be no need for supervision -- everyone would know what risks banks were taking!

[12] Note that this effort is distinguished from that of Morgan in including the operating environment and transparency as part of the broad regulatory environment, and from Ramos in quantifying and ranking the countries, as well as on the content of the various indicators.

[13] There is no intention to suggest that authorities should admit more foreign banks regardless of the initial conditions in banking and at a rapid pace, as foreign banks in some settings could be a source of instability. There are solid banks in developing countries that are domestic banks. But it is at least arguable that foreign banks, the majority of which are from OECD countries, have better banking and in particular risk management skills. Claessens, Demirguc-Kunt, and Huizinga show that foreign bank entry leads to lower profits and overheads for domestic banks, increases the stability of the financial system and promotes long term growth. If this variable were dropped, it turns out that only the positions of Colombia and the Philippines are reversed, and Thailand moves from 11th to tied for 10th place with the Philippines.

[14] If liquidity requirements are not well-remunerated, then bankers will do their best to avoid them.

[15] Thus this ranking goes beyond what was attempted in Morgan (1997) and is more rigorous that Ramos (1997). A more thorough classification of financial sector regulation will be attempted in a World Bank research project, which is just beginning, and which will be compiling more extensive information on how financial systems are regulated *and supervised*. Note, the LaPorta et al measure of accounting was not used as no data were available for Indonesia, and the indicator for Argentina, which dated back to the early 1990s, is known to be out of date.

[16] Spreads on sovereign borrowing would be more informative but are not available for all these countries.
[17] In addition to various national sources and those noted following various tables, sources included: JP Morgan (1997), Ramos (1997), Hong Kong Monetary Authority (1997) and IMF (1997).