

**Market Discipline and Financial Crises**  
**An Analysis of Stock Prices in Japan, Argentina, Chile and Mexico,**  
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## I. Introduction

Many countries, both developed and emerging, have experienced banking and currency crises in recent years. These episodes have been extremely costly posing a substantial burden on individual countries and the global economy. Given the detrimental effects of these crises, a lot has been written in order to learn more about their causes, channels of contagion, indicators of early warnings of distress and the role of supervision or lack thereof, among others. One of the topics that remains relatively unexplored however, is the role of "*market discipline*" in the context of banking crisis. Particularly, if "market discipline" exists and if it has functioned before, during, and after crisis episodes to shape the behavior of market participants.

The studies that focus on this issue mostly concentrate on the behavior of depositors in banking systems under distress. This paper will add to the current literature by analyzing the behavior of stockholders in the banking system instead of that of depositors. In addition, this paper undertakes an empirical comparison of Japanese and Latin American domestic and foreign investors under crisis episodes and evaluates the measures implemented in each country to gauge the influence and development stage of "*market discipline*".

The analysis of market discipline will be reviewed in the context of the Pillar 3 of the new Basle accord. Empirical tests will be undertaken to evaluate the fulfillment of the requirements of the Pillar 3 by determining the presence of disclosure requirements, monitoring of the regulations for disclosure necessary for market discipline to operate and effective impact of market discipline over time and across countries. The countries included in the analysis are Japan, Argentina, Chile and Mexico in order to make comparisons between the behavior and reaction of investors in the banking sector of Japan and Latin America under country specific periods of financial distress.

The rest of the paper will be organized in the following manner. Section II, summarizes recent work on the subject. Section III, defines market discipline and describes the evolution, influence and monitoring mechanisms in place in Japan, Argentina, Chile and Mexico to comply with its requirements. Section IV, describes the methodology and data used in the paper. Section V, presents the empirical results and Section VI, the authors' conclusions.

## II. Literature Review

Most studies of the role of market discipline have focused on depositors, the role of

deposit insurance, bond prices (i.e., bonds issued by banks) and the behavior of bondholders. Recently, however research has shifted to demonstrate that the combination of loose bank supervision, lack of a regulatory framework and limited market discipline may have added to the root causes of recent crises. In spite of these advances, much is still unexplored in the context of market discipline. Very little has been done regarding the behavior of foreign banks operating in local markets at times of crisis and basically nothing analyzing the relationship between stock prices and market discipline and the behavior of stockholders during episodes of turmoil. This paper will attempt to fill this gap by analyzing the response of market discipline given financial institutions' stock prices and the behavior of stockholders during times of financial turmoil.

The definition of market discipline will be more extensively dealt with in the next section of this article and can be characterized as the process by which market investors (i.e., bondholders, depositors and stockholders) evaluate changes in bank's risk and undertake actions which lead bank's management, shareholders, or other players to undertake corrective measures to control the risk level.

A large set of literature argues that market discipline can be enhanced by the attitude of depositors. Theory explains that if financial institutions increase their level of risk, depositors might withdraw funds, or demand a larger return in response. For example, Calomiris and Powell (2000) explain that increases in default risk caused by adverse shocks to bank asset risk and capital should be mean-reverting. In particular, they demonstrate that banks that suffer from those types of shocks face a strong incentive to either reduce asset risk or leverage, or increase capital to avoid disciplinary withdrawals of funds by depositors. Empirical findings show that deposit rates and deposit growth during the banking crises in Argentina are significantly linked to banks' fundamentals. Along the same line, Adolfo Barajas and Roberto Steiner (2000) analyze how depositors in Colombia choose among different banks over time to discipline bank behavior. The study shows that depositors prefer banks with stronger fundamentals. In particular, fundamentals that tend to improve after being punished or disciplined by the market, i.e., the depositors.

Analytical work has also focused on the relationship between deposit insurance and market discipline. Specifically, it is argued that deposit insurance and blanket guarantees have a direct impact on market discipline<sup>1</sup>. Demirgüç Kunt and Huizinga (1999) show empirically that explicit deposit insurance reduces market discipline by abating the sensitivity of liability interest rates to bank risk factors. In addition, they claim that higher explicit coverage and funding from government sources reduce market discipline, while joint or private management of funds improves it. Demirgüç and Detragiache (1999) also find that moral hazard is stronger if the scheme is funded by the government while milder if privately funded. Moreover, they find that the negative impact of deposit insurance is greater in economies with institutions of poor quality. Notwithstanding, Martinez Peria and Schmukler (2001) indicate that, after the Tequila crisis, depositors in Argentina

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<sup>1</sup> Deposit insurance and blanket guarantees may create a moral hazard problem because depositors know that the Government covers their funds in case of bank failure.

exercised a monitoring function on banks for bad behavior despite the existence of a deposit insurance system.

Another strand of research has focused on the behavior of bondholders<sup>2</sup>. For example, Daniel P. Monger and Kevin J. Stiroh (2001) provide evidence of market discipline for bondholders in the United States. Their research investigates how the spreads of Banking Holding Companies (BHC) and bank's bonds reflect differences in asset portfolios across banks, and changes within a given bank, i.e., "*the asset test*". Findings demonstrate that the spreads increase significantly as banks shift out of cash into commercial and industrial loans. Moreover, Flannery (1998) affirms that bond investors in the United States seem to act as supervisors, since they are concerned primarily with the bank's probability of failure.

A fewer number of authors have focused on the potential positive influence of foreign institutions on market discipline. Mishkin (2001), for example, argues that the entry of foreign banks should be seen as an opportunity to strengthen the domestic banking system. The presence of foreign banks with expertise in risk management, for example, can encourage adopting best practices. Claessens, Demirgüç and Huizinga (1998) corroborate this view and show that in developing countries, the entry of foreign banks reduces the profitability and the overhead expenses of domestically owned banks. This implies that the overall welfare implications of foreign bank entry are positive.

However, it becomes clear from the literature that most authors believe that market discipline constitutes a complement to finance supervision that depends on the development of the financial markets to maintain bank safety in a rapidly variable environment and to reinforce the positive effects of bank supervision and regulation.

The study of the evolution of market discipline during financial crises and the reactions of investors can reveal whether market discipline exist and whether investors have the capability of influencing management and policy makers to undertake measures that bring risk to more acceptable levels. Within this context, we evaluate the behavior of the stock prices of banks and financial institutions that have operated in Japan and selected Latin American countries during the financial crises of the 1990s and early 2000.

### **III. Market Discipline in Japan, Argentina, Chile and Mexico**

Berger (1991) describes market discipline in the banking sector as a situation in which private sector agents (stockholders, depositors or creditors at large) face costs that

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<sup>2</sup> According to the literature market discipline can be enhanced by imposing a mandatory uninsured debt requirement imposed on banks, i.e., requiring banks to issue unsecured bonds. These unsecured bonds act as an important instrument to enhance market discipline. If a bank suffers losses of assets value, it faces an increase in asset risk or has excessive leverage, uninsured debt holders would discipline the bank by raising the spreads and inducing (i.e., forcing) the bank to act in a way to reduce risk or leverage. The reasoning behind the mandatory issuance of bonds by banks is that unsecured bondholders would partly offset the moral hazard invited by insured depositors' indifference to risk and would push bankers towards more efficient and competitive behaviors.

increase with the risks undertaken by banks and take action on the basis of these costs.

Flannery and Sorescu (1996), on the other hand, define market discipline as the process by which informed market investors anticipate changes in bank risk conditions and punish those banks that increase their level of risk or leverage.

Bliss and Flannery (2000) elucidate on the two distinct functions of market discipline: “monitoring”, and “influence”. Monitoring refers to the investors that understand firm’s condition and incorporate the assessments promptly into the prices of securities (i.e., stocks and bonds). Influence refers to the process by which changes in the prices of a security make a firm’s management or other actors to respond in such a way to counteract the adverse changes in the firm’s condition.

The recommendations concerning market discipline have been expressed in the recent document of the New Capital Adequacy Framework of the Basle Committee on Banking Supervision (January 2001). According to this document, market discipline (Pillar 3), is intended to complement the minimum capital requirements (Pillar 1) and the supervisory review process (Pillar 2). In particular, *“the committee aims to encourage market discipline by developing a set of disclosure recommendations and requirements, which would allow market participants to assess key pieces of information on the scope of application, capital, risk exposure, risk assessment and management processes, and hence the capital adequacy of the institution”*.

Some of those recommendations state that Banks and financial institutions should have a formal disclosure policy; and bank supervisors should be satisfied that banks and financial institutions publish regularly financial statements, which reflect their financial conditions. In case of lack of compliance with the disclosure recommendations, supervisors are expected to undertake some action to remedy the situation.

Tables 1 and 2 in the appendix describe the importance of disclosure and transparency for the purposes of banking supervision. Table 3 provides an exposition of the characteristics of disclosure. These include comprehensiveness, relevance, timeliness, reliability, comparability and materiality.

Moreover, it is extremely important to understand the requirements of disclosure and transparency because they provide valuable information to market participants. Information that would be fundamental in introducing market discipline from stockholders, depositors and creditors.

Once agreement has been reached on the definition and importance of market discipline, we can turn to an issue that has been intriguing policymakers and academics alike, namely determining if market discipline exists and how it works.

To determine the existence of market discipline in a particular country, one should go a step further and focus not only on the requirements of the Basle Committee, but also on the legal, judicial, regulatory and administrative instruments in place. These factors

constitute the necessary, but not sufficient, condition to assure participants that market discipline operates in a country and can monitor and influence the decisions of banks and other financial institutions.

The factors, which we deem crucial for the establishment of market discipline, fall under five categories:

Legal and Regulatory Framework: This is essential since it establishes property rights and a culture of credit. Under this heading, we include measures to assure transparency and disclosure, the banking regulatory regime and supervision; the application of accounting and auditing principles and practices, and corporate governance.

Judicial System: This category includes the enforcement of law and contracts, the effective enforcement of bankruptcy provisions and the protection of minority shareholders.

Capital Market Infrastructure: This category includes correct pricing, yield curves, stock exchanges; the functioning of the function of brokers, traders, institutional investors; bond market including banks and financial institutions that issue bonds, issuance of stock, and rating institutions.

Role of the State: This category identifies various forms of government intervention, e.g., credit allocation, the setting of special interest rates and/or granting foreign financial institutions authorization to operate in the country. The government is also responsible for the regulation and supervision of the private sector, and the regulatory functions are included in the first category concerning the legal and regulatory framework.

Deposit Insurance: Deposit insurance schemes should not favor moral hazard behavior.

Tables 4 and 5 describe the framework and factors in place during the last 10 years in each country to qualitatively evaluate the existence of market discipline and assess its potential for success. This information gauges the degree of commitment of local governments to market discipline and to the development of an efficient capital market. However, this framework only highlights important factors and is not intended to provide an exhaustive assessment of pre-requisites for a market to function effectively.

Table 5 clearly shows that Japan and the three Latin American countries have introduced, albeit at different speeds, instruments that propitiate the existence of market discipline. Thus it is only logical to wonder *how well market discipline is being exercised and how influential it is on managerial and policymakers' actions*. Therefore, it is necessary to determine several aspects related with the existence of market discipline: the efficiency of the disclosure rules, the effects on market valuations and the corrective actions that financial institutions could take and do take in face of these market pressures.

To determine the situation of these aspects, it is necessary to identify a set of indicators that would allow stockholders, depositors and creditors at large to gauge the health of

financial institutions and pressure for changes, as well as the remedial responses that financial institutions take. Table 6 in the appendix provides a set of well-known indicators that are usually applied to evaluate mature and emerging market financial institutions. Some of those indicators are: stock prices; bond prices; inter-bank rates; interest rates paid on deposits; the spread between deposit and lending rates; the share of government assets; the share of foreign banks, among others.

In addition, Table 7 in the appendix indicates how the market could influence financial institutions through market discipline and the outcomes that could be expected, among them, reduction of the risk profile, and reduction of leverage. The market, in turn, would evaluate the measures undertaken by the financial institutions and respond accordingly.

Of particular interest to this paper is the evolution of market discipline during episodes of distress. The remainder of the analysis focuses on banking institutions and stock markets in four countries in order to establish whether the market has disciplined financial institutions and exercised influence before, during and after turmoil episodes.

#### **IV. Methodology and Data**

To analyze market discipline, we focus on the behavior and reactions of foreign and domestic investors in the banking sector of four countries during financial turmoil episodes. The focus of this paper, unlike others, will be on stock returns of the countries' major stock indices and on a sample of banking institutions ranging from very strong and solvent to relatively weaker.

Daily Bloomberg stock price data for Argentina, Chile, Japan and Mexico from January 1994 to April 2001 is used in the analysis. Returns of Index or of the particular stocks are calculated as the log first difference of the stock prices. Dividends are excluded because they were missing or not available for most of the emerging market stocks selected for the sample. A list of the financial institutions included in the sample can be found in the appendix.

The periods of financial crisis selected for the analysis are the Mexican Crisis and the Brazilian turmoil episode for Mexico, Chile and Argentina. However, Chilean data starts in January 1998 so given the sample limitations only the Brazilian turmoil episode is used for the regressions. The Japanese crisis episode is different from that of the other three countries and extends during most of the sample period. We identified the beginning of the Japanese banking crisis to be December 1996 (i.e., marking Prime Minister Hashimoto's announcement of the Big Bang reform of the financial system) and the end of it to be around November 1999 when the Japanese government announced an economic revival package. We considered the pre-crisis period to extend from January 1994 to November 1996 and the Post crisis period from November 1999 to the end of the sample.

Several econometric and statistical tests were conducted to analyze the property and characteristics of the stock returns.

We primarily test the Normality of the distribution of security returns for the market indices and financial institution stocks by undertaking tests of skewness and kurtosis and using the Shapiro-Wilk and Jarque-Bera tests of normality to verify them. This test plus some measure of the evolution of market efficiency during the period would let us infer whether the market is functioning, able to monitor and therefore, discipline market players.

In addition, the paper analyzes the efficiency of stock prices. This is important because when markets are informationally efficient they allocate resources proficiently. The theory of market efficiency argues that in an informationally efficient market, price changes must be unforecastable if they are properly anticipated. Moreover, Black (1971) explains that a perfect market for a stock is one in which there are no profits to be made by people who have no special information. He explains “*we would like to see randomness in the prices of successive transactions, rather than great continuity*”. Consequently, a measure or test of efficiency, “weak form efficiency” to be more precise, since our information set includes only the history of prices or returns, is to analyze if the series suffer from potential positive correlation.

However, since normality tests revealed that returns were not normally distributed in our sample, theory calls for a different test to analyze efficiency. When returns are not normal, the theory of runs provides a test of weak form of market efficiency or randomness that does not require normality. The run test is a nonparametric test of randomness in a series. Thus a sequence is considered nonrandom if there are either too many or too few runs (i.e., a run is a change in the sign of the stock return), and random otherwise.

To evaluate the behavior of returns, quantify the tradeoff between risk and expected returns and ultimately test if the market has disciplined the sampled institutions, we estimate the following market model and Capital Asset Pricing Model:

The market model is expressed as,

$$R_i = \alpha_i + B_i R_{mi} + e_t$$

$$E[e_t]=0 \text{ and } \text{Var}[e_t]=\sigma^2$$

Where  $R_i$  is a vector of returns;  $R_{mi}$  is the market return and  $e_t$  is the zero mean disturbance term. Therefore, we assume that ordinary least square is a consistent estimation procedure for the market model parameters.

We estimate this regression for each security and corresponding market index separately in order to analyze the behavior of returns of various financial securities in each country during pre-crisis and post-crisis episodes. The regression returns are evaluated in local currency and therefore, mostly capture the behavior of domestic investors in the sector.

The Capital Asset Pricing Model, on the other hand, assumes the existence of lending and borrowing at a risk-free rate of interest. This model allows returns to be expressed in excess of the risk-free rate or in terms of excess returns.

$$E[R_i]=R_f+\beta_{im}(E[R_m]-R_f)$$

Where  $R_m$  is the market return,  $R_i$  is the return on the  $i$ th asset and  $R_f$  is the return on the risk-free asset. If we assume, however, that  $Z=R_i-R_f$ , we can rewrite the Capital Asset Pricing equation in terms of excess returns,

$$E[Z_i]=\beta_{im}E[Z_m]$$

Given data constraints we use as the risk free asset return, the return on a 3-month US Treasury Bill and express the returns on particular assets as well as on the respective market indices in terms of U.S. dollars. Given the data constraints, this equation would basically capture the behavior of foreign investors in the sector.

In both cases, i.e., returns in local currency and in US dollars, we test if the beta coefficient changes significantly during the various periods considered. For example, a significant increase in the Beta coefficient during a crisis period and a significant decline during a post-crisis episode would give us ammunition to argue that investors have disciplined the market. In other words, investors have recognized the increased risk in the particular security and have forced changes and managerial actions to be undertaken or, as might be the case in Japan, actions from policy makers in order to reduce risk.

## V. Empirical Results

In general, econometric and graphical analysis demonstrates that periods of crisis and turmoil are associated with reductions in the average value of bank stock prices in the three Latin American countries and Japan. These reductions are consistently larger for banking institutions than for the countries' stock markets.

Periods of larger variance in bank stock returns coincide with identified crisis episodes across all markets in the sample. The highest variance episodes are found in Mexico and the lowest ones in Chile. Moreover, the variance of bank stock returns is consistently larger than that of stock market indices.

None of the markets analyzed show signs of weak form efficiency although there are signs of improvements in efficiency towards the end of the sample period.

Econometric results are somewhat mixed. Nonetheless, we can confidently claim that regressions demonstrate the existence of market discipline exercising a monitoring function and to a certain extent, market influence. Market discipline, reflecting higher degrees of efficiency and a more significant reaction of investors, showed clear signs of improvement towards the culmination of the sample period.



## Japan

In general, we find that the Japanese banking sector has been engulfed in a long crisis that encompassed most of the 1990s decade. The early nineties however, were an exception. During the early part of the sample, graphical analysis demonstrates very stable stock price behavior across all sectors, which can be largely attributed to the lack of monitoring and disclosure mechanisms. During 1995 Japanese financial institutions felt the early signs of turmoil. A few institutions failed and the government felt the necessity of establishing a deposit insurance scheme. Our non-parametric tests reveal a banking sector that behaves more efficiently than the overall market (Nikkei index). And graphical analysis demonstrates that negative and larger returns are associated with periods of turmoil (Graphs 1 and 5), which in turn, reflect losses in bank's stock prices (Graphs 9 and 10).

Econometric analysis reveals that domestic and foreign investors perceive that the banking sector is somewhat safer than the market (beta coefficients significantly lower than 1). However, while domestic investors perceive no additional risk after the crisis episode (as defined above), foreign investors show a decrease in their perception of risk of the Japanese banking sector (Tables 8 and 9). It is obvious that there is no clear perception of additional risk in those institutions that suffered substantially during the crisis and were forced to merge or be re-organized. This finding leads us to conjecture that the market has not fully disciplined banks nor promoted changes. This could be attributed to several factors, including that government intervention packages have mitigated the perception of risk providing investors with a sense of calmness or artificial security. On the other hand, it is apparent that both foreign and domestic investors can clearly distinguish between stronger and weaker banks. In fact, stronger banks, perceived as good banks, tend to show a decrease in investor's perception of risk during the post-crisis period. Weaker banks, which have undergone mergers and/or re-organizations, demonstrate decreasing levels of price efficiency towards the later part of the period in spite of increased levels of disclosure in the sector, while risk seems to remain stable.

## Mexico

The Mexican Market seems to show a decrease in price efficiency after the Tequila crisis episode (Graph 15). The banking sector follows a similar pattern—lower efficiency levels—until the year 2000 when efficiency levels seem to slowly start improving. As it was the case in Japan, Mexican crises are associated with large and negative stock returns, which coincide with lower stock prices throughout the period (Graphs 2, 6 and 11).

Econometric analysis shows a sharp increase in the level of risk perceived by both domestic and foreign investors during the Tequila crisis and beyond (Tables 10 and 11). The level of risk increases continuously until 1999 and only then starts decreasing (higher values of the beta coefficient). In particular, Table 11 shows that foreign investors perceived relatively higher levels of risk than domestic investors during the post-Tequila episode, which also subsided by the end of 1999. The decrease in perceived risk might reflect increased actions undertaken (i.e., managerial actions) to reduce the level of risk of particular banking institutions (i.e., asset risk, leverage and/or liquidity). These actions

were prompted by regulators in an effort to show improved signs of market discipline and increase foreign investment in the sector.

### Argentina

The behavior of the Argentine stock market seems to be surprisingly efficient (Graph 16). The banking sector however, seems to be relatively less efficient, showing no clear signs of improvements by the end of the sample period. Graphical analysis demonstrates that low returns are associated with periods of turmoil and that the market stock returns fluctuate just as much as those of the financial institutions sampled (Graphs 3 and 7).

Econometric evidence shows that, just like in Mexico, both domestic and foreign investors perceived the level of risk of Argentine banks to start increasing since the Tequila crisis episode and continuing non-stop until the end of 1999, when the banking sector weathered the Brazilian turmoil (Tables 12 and 13). Starting in the year 2000 however, results show signs of a lower perception of risk, particularly for the stronger banks in the country. This perception seems to be shared by both domestic and foreign investors. As was clear in the case of Mexico, results concerning Argentine financial institutions show that the market has influenced and disciplined banks after the Tequila crisis. The change might be signaling that the banking sector had successfully overcome the Brazilian turmoil, as explained by Calomiris and Powell (2000).

### Chile

Between the years 1998 and 2001 we find an efficiently behaved Chilean banking sector, which as expected, does not seem to have been influenced by the Brazilian turmoil (Graphs 4, 8 and 13). The same cannot be said of the Chilean stock market index IPSA, which according to statistical analysis, seems to behave in a less efficient manner during the same period (Graph 17).

Regression results demonstrate that during the last three years of analysis the perception of risk of domestic investors seems to have declined slightly while that of foreign investors seems to have stayed constant (Tables 14 and 15). Beta coefficients for the banks in Chile are relatively lower than those found for other countries in the sample, which reflects an overall lower level of risk.

### Event Studies

To analyze the rate at which markets respond to particular events, we analyzed the Mexican Crisis of 1994 and a Japanese bank merger in 1999 (Sanwa Bank-Toyo Trust). We considered December 1994 and January 1999 as the “event” or crisis episode and analyze the change in responses during the two months before and after the event.

Econometric results reveal that Argentine banks during the “event” or tequila episode suffered from a substantial increase in their beta coefficients. Interestingly enough, this increase in beta coefficients, which denotes a higher perception of risk, quickly dissipated in the eyes of domestic investors following the announcement of the implementation of a rescue package during the early 1995. The reaction of foreign investors, however, was not the same. The perception of risk of foreign investors did not decline at all during the

post-crisis event window.

For Mexican banks the situation was similar but the increase in risk was more abrupt and lasted longer. Graphical and econometric analysis demonstrates that risk levels increased continuously during the two months following the “event”. Obviously, to the eyes of both foreign and domestic investors the crisis was not over.

The event study capturing the effects of the merger of the Sanwa Bank and Toyo Trust during January 1999 failed to reveal significant domestic and foreign investor’s reactions or changes in their perception of risk. The beta coefficients were mostly insignificant and therefore, we cannot say that we were capturing the effects of the “event”. This might, however, be a reflection of the relatively slower reaction of the Japanese stock market and the higher levels of government intervention.

## **VI. Conclusion**

This paper set out to study the existence and evolution of market discipline in Japan, Mexico, Chile and Argentina during times of financial turmoil by analyzing the behavior of foreign and domestic investors in the banking sector. The qualitative analysis reveals that regulators are actively considering the formal use of market discipline in the supervisory process. However, during financial crisis episodes, empirical results do not fully support such a claim across all sampled countries.

Market discipline stemming from stocks exercises a signaling role whose influence seems to be mostly over policymakers and not institutions. This is seen particularly in the emerging markets in our sample and also in Japan, a country that has a more developed capital market. The influence over policymakers serves to speed up their interventions and to mitigate the impact of the financial crises.

When comparing empirical results we find that Latin American countries react relatively faster to market disciplining signals during times of crisis than Japan. The study also finds evidence of the different phases of market discipline: existence, monitoring and influence and corroborates the fact that governments in both Latin America and Japan have undertaken strategies directed towards the development of capital markets and the implementation of market discipline. However, as already mentioned, the response to market discipline has been stronger and more market oriented in Latin Americas than in Japan. In Japan, the government more than the market has, albeit slowly, reacted to the signals of market discipline by trying to guide the banks out of the crisis.

There is much left to be done in this field. In particular, further research should focus on finding additional indicators of market discipline such as bonds issued by banks; stock and bond prices of corporations in distress; deposit and lending rates of particular banks; inter-banking rates that have yet to be studied in this context.

Other important areas of future research are the behavior of foreign banks during times of

crisis in order to make analogies with the U.S. banking crisis i.e., Bank of America and Saving and Loans episodes.

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## **Appendix**

Sample of Countries:

Japan  
Argentina  
Mexico  
Chile

Data:

Daily from January 1994 to March 2001.  
Stock price index  
Banking index  
Nominal Exchange Rates (national currency per US\$)  
3 month US Treasury bill (returns)  
Stock prices (returns) of individual banks affected by the crises

Returns are the log first difference of prices. Dividends not included

Japanese Banks:

Bank77  
Fuji  
Sanwa  
Shizuoka  
Sumitomo

Mexican Banks:

Banamex  
Bancomer  
Banorte

Argentine Banks:

Bansud  
Frances  
Galicia

Chilean Banks:

De Chile  
Edwards  
Santander  
Santiago