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The Impact of Latin American Debt Crisis on U.S., U.K., and Canadian Bank Stocks.

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TABLE OF CONTENTS

LIST OF TABLES

THE IMPACT OF LATIN AMERICAN DEBT CRISIS ON U.S., U.K., AND CANADIAN BANK STOCKS

ABSTRACT

The 1980s have been a decade of crisis for banks engaged in international lending. This dissertation examines the impact of twelve events related to the Latin American debt crisis on the market value of the U.S, U.K, and Canadian bank stocks. The existing literature is extended in several directions. First, different types of events and several events of the same type are analyzed to enhance the generality of the conclusions. Second, a general theoretical framework involving two testable hypotheses is utilized to interpret the economic significance of the events. Third, the capital regulation hypothesis is tested extensively and it helped to clarify some of the ambiguities presented by earlier literature on the Mexican moratorium event. Fourth, the Generalized Autoregressive Conditional Heteroscedasticity (GARCH) model is used to address some of the problems associated with the Ordinary Least Squares (OLS) market model. These include nonnormalities, nonlinearities, and heteroscedasticity, and Cornell and Shapiro's criticism against use of event study methods for studying the impact of the debt crisis. Finally, the international dimension of the Latin American problem is recognized by extending the analysis to the British and the Canadian banks.

Most of the events produced significant event-day excess returns for the U.S. banks with Latin American loans. The market distinguished high-, medium-, and zero- exposure groups among banks. The four moratoria (Mexican, Argentinean, Bolivian, and Brazilian) as a class, produced strong and consistent results, although the underlying dynamics of the moratoria differed. This study provides perspective on the economic impact of capital regulation and demonstrates a link between external exogenous events and bank value.

The analysis suggests that the GARCH model does not make a significant difference to event study results. The results for the British and the Canadian banks differ somewhat from those for the U.S. banks. Differences in capital regulation in the three countries may explain the differential reaction of the three markets for the same set of events related to the Latin American debt crisis.

CHAPTER 1

INTRODUCTION

In August 1982, Mexico declared a moratorium on servicing its external debt, thus triggering a major international debt crisis. Since the Mexican moratorium, other Latin American countries (e.g., Chile, Venezuela, Peru, Bolivia) negotiated debt-rescheduling accords with their bank creditors. In February 1987, Brazil, the world's largest debtor country, unilaterally suspended interest payments on its foreign debt. Throughout the 1980s the Latin American debt crisis has been a major problem demanding the attention of international bankers, the International Monetary Fund (IMF), the World Bank, the United States government, and academicians.

Several major banks of the industrial countries such as the U.S., U.K., Japan, and Canada have been big lenders to Latin America.[1] The possibility of an outright default by Latin American debtors has serious implications for these banks. The debt crisis heightened public concern about the structural soundness and solvency of international banking system. Since the Mexican moratorium, considerable progress has been made toward resolving the debt crisis. The major debtor countries have adopted strong measures for structural

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[1]The exposure of these banks to Latin American debt exceeds 100% of their shareholders' equity.

adjustment in their economies. Banks have significantly boosted their reserves against losses on loans to developing countries and strengthened their capital base. As a result, the threat to the world financial system has receded. However, the debt crisis is far from being resolved.

The international banking industry is poised for significant changes in the 1990s and the market's assessment of bank stocks is going to be one of the important factors in shaping these developments. One of these changes is nationwide interstate banking becoming effective in the U.S. in 1991. Consequently, intense merger activity is expected in the banking industry in the 1990s. Another development is the new capital guidelines approved by bank regulators of ten major industrialized countries. Banks deemed to be inadequately capitalized under these guidelines may lose market share to strongly capitalized banks that will have the flexibility to expand. Thus, analysis of market reaction to several events related to the Latin American debt crisis may shed some light on how the market will assess the changes and events which will shape the banking industry in the '90s. In other words, the analysis will have a bearing on issues of capital adequacy and access to capital markets for major international banks.

Several studies have examined the impact of the Mexican debt moratorium announcement on the market value of the U.S.

bank shares.[2] These studies arrived at conflicting findings. Schoder and Vankudre (1986) and Cornell and Shapiro (1986) find little effect on the event day, suggesting that the announcement had little informational content. Lamy, Marr, and Thompson (1986) find a negative impact on the event day and a negative effect for debt exposure on excess returns. Bruner and Simms (1987) find a significant negative effect on the event day and note that this effect was invariant to the level of bank debt exposure. Only for a time span beginning several days after the announcement do Bruner and Simms find evidence that bank returns are correlated with debt exposure ratios. Thus, there is a need to reconcile these conflicting results.

Other studies examined events such as the Brazilian moratorium, legislative actions and the announcement of debt reschedulings.[3] Several hypotheses (e.g., new information hypothesis, rational pricing hypothesis) have been proposed to explain the results of the Mexican moratorium and other events related to the Latin American debt crisis. But, the regulatory aspect of the banking industry, especially capital regulation, is generally ignored in these theories.

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[2]The major studies are Schoder and Vankudre (1986), Cornell and Shapiro (1986), Lamy, Marr, and Thompson (1986), Smirlock and Kaufold (1987) and Bruner and Simms (1987).

[3]These studies include Cornell, Landsman, and Shapiro (1986), Glascock, Karafiath, and Strand (1986), Billingsley and Lamy (1988), Viswanathan and Philippatos (1989), Ozler (1989), and Musumeci and Sinkey (1990 a,b).

There are several special features of the Latin American debt problem. First, events of similar nature took place over a period of time. Thus, there are four moratoria at different points in time, namely, Mexican in August 1982, Argentinean in September 1982, Bolivian in May 1984, and Brazilian in February 1987. This provides an opportunity to analyze these four similar events and compare investor response to the four events.

Second, different types of events (e.g., borrower-induced events such as moratoria on debt payments, lender-induced events such as the increase in Citicorp's loan-loss-provision, and events exogenous to the borrower-lender relationship such as the Falkland War, Baker plan, and the slump in oil prices) affected the same sample of bank stocks. There is no empirical study exploiting this aspect of the problem.

Third, the Latin American problem has an international dimension in that it affected the major banks of the industrial world. For example, the U.S., British, and Canadian banks held about 36%, 12%, and 9%, respectively, of the total Latin American debt in 1984.[4] Thus, this problem offers an opportunity to study the market reaction to the same events across different markets and to extend the generality of the proposed theoretical models.

This dissertation attempts to exploit these interesting

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[4]Source: *World Financial Markets*, July 1985, Morgan Guarantee Trust Co.

features of the Latin American problem by analyzing a series of events during the period 1982-1987. For each event, the risk and return characteristics of the U.S., U.K., and Canadian bank stocks are examined.

Most of the empirical studies on the Latin American debt crisis have employed event study method. Excess returns during the event period are measured from the market model using the Ordinary Least Squares (OLS) estimation method. However, numerous econometric problems exist with this procedure. Empirical studies (e.g., Brown and Warner 1985, Lee 1976 a,b; McDonald 1983) show that the daily excess returns from the market model exhibit nonnormalities and nonlinearities resulting in a higher Type I error. A number of studies (e.g., Bey and Pinches 1980, Giaccotto and Ali 1982, McDonald and Morris 1983) document the presence of heteroscedasticity in the market model. Studies by Beaver (1968), Patell and Wolfson (1979), Kalay and Lowenstein (1983), Christie (1983), and Ohlson and Penman (1985) document significant increases in variance during the event period. The change in variance results in misspecification of hypotheses tests for the significance of excess returns during the event period. Although the problem of heteroscedasticity is well recognized in the literature, the approach to correcting it is rather *ad hoc*. Cornell and Shapiro (1986) point out that the standard event study method is not suitable for analyzing the Latin American debt problem since it cannot

handle the leakage of information prior to the event. This dissertation attempts to address these empirical issues by employing the Generalized Autoregressive Conditional Heteroscedasticity (GARCH) model.

The structure of the dissertation is as follows. In Chapter 2, two streams of literature, namely, various theories/hypotheses proposed to explain the events related to the Latin American debt crisis, and the empirical studies on different events, are reviewed. In Chapter 3, twelve events are identified for detailed analysis. A brief description of each event and its hypothesized impact on bank stock prices are provided. The chapter also contains a description of the institutional background and data for the U.S., U.K., and the Canadian banks. In Chapter 4, two hypotheses, the new information hypothesis and the capital regulation hypothesis, are proposed to explain the significance of various events and also to reconcile the conflicting results of earlier studies on the Mexican moratorium event. The deficiencies in the OLS market model are addressed by using the GARCH model. In Chapter 5, the results of measuring excess returns using the OLS and the GARCH models are compared. The events for which the event day excess returns are found to be significant are analyzed further in Chapter 6 to test the two hypotheses. In Chapter 7, the analysis of events is extended to the U.K. and the Canadian banks. Chapter 8 contains a summary of the dissertation and suggestions for future research.

CHAPTER 2

LITERATURE REVIEW

The Latin American debt problem generated considerable interest in economics and finance literature due to its potential threat to the viability of the international financial and banking system. Finance literature has traditionally employed event study methodology to analyze the impact of specific events like the Mexican Moratorium on the value of major U.S banks involved in the Latin American debt crisis.

Analysts have offered various theories/hypotheses to explain the impact of Latin American debt crisis on U.S. bank shares. These are reviewed in the next section. Review of the empirical studies examining the excess returns during the event period constitutes the subject of Section B of this chapter. The last section summarizes the discussion.

A. Theoretical Explanations

The diversity of arguments put forward in the literature concerning the debt crisis points to the complexity of the Latin American problem. Although treated as competing explanations, they all capture important dimensions of the crisis. Table 2.1 summarizes extant theoretical explanations in the literature. A detailed review follows.

1. New Information Hypothesis

The new information hypothesis is based on the efficiency of capital markets.[1] From this theoretical underpinnings various authors have argued that stock prices should provide a quick and unbiased reflection of all new information available in the market. In the context of the Latin American debt problem, the new information hypothesis argues that new information provided by an event about the quality of Latin American loans should be immediately incorporated in the stock prices of the affected banks.[2]

2. "Dribs and Drabs" Hypothesis

The information-leakage hypothesis or the "dribs and drabs" hypothesis argues that information about the quality of Latin American loans leaked into the market over a long time (Cornell and Shapiro 1986).[3] According to this hypothesis, bank stock prices reflected the information even prior to the Mexican announcement of moratorium due to the arrival of

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[1]Beighley (1977), Pettway (1980), and Pettway and Sinkey (1980) report evidence that the market for the shares of large commercial banks is semi-strong form efficient.

[2]This hypothesis was proposed by Schoder and Vankudre (1986), Smirlock and Kaufold (1987), Bruner and Simms (1987), Viswanathan and Philippatos (1989), and Musumeci and Sinkey (1990 a,b).

[3]The "dribs and drabs" hypothesis is a modified version of the partially anticipated events model of Malatesta and Thompson (1985). The latter researchers argue that the effect of any event consists of two components: the economic effect and the announcement effect. If an event is partially anticipated, the observed announcement effect will be attenuated compared to an equivalent unanticipated event.

information at the market in dribs and drabs. The leakage of information into the market over a period of time suggests that no single event by itself exerts a significant influence on stock prices but the cumulative effect of all the events combined may be significant. Thus, Cornell and Shapiro propose that an announcement such as the Mexican moratorium may not have any effect on bank stock prices, although the Latin debt crisis as a whole could have an impact on annual and biannual returns of bank stocks.

The above two hypotheses are concerned with the swiftness of market reaction to an event. The next two hypotheses, the rational pricing hypothesis and the contagion hypothesis, deal with the size of investor response.

3. Rational Pricing Hypothesis

Schoder and Vankudre (1986), Smirlock and Kaufold (1987), and Bruner and Simms (1987) argue that the impact of the Mexican moratorium event on bank stock prices should be correlated with their exposure levels. The implication is that banks with high exposure should experience a larger price change than banks with low exposure.

4. Contagion Hypotheses

An alternative to the rational pricing hypothesis is the investor contagion hypothesis, which argues that any negative signal about a bank or a group of banks spills over to other

banks not directly connected with the signal.[4] In the context of the events related to the Latin American debt crisis, the hypothesis implies that the extent of the share price response is not related to the level of Latin American exposure of each bank. The market penalizes all banks irrespective of their degree of exposure because the event (e.g., Mexican moratorium) is treated as a "common type of bad signal".[5]

Bruner and Simms (1987) investigate the contagion hypothesis in the context of Mexican moratorium while Glascock, Karafiath, and Strand (1986) examine five major international defaults and reschedulings in 1982. Musumeci and Sinkey (1990a) propose two different types of contagion while analyzing the Brazilian moratorium event. In addition to the investor contagion effect, they propose country contagion effect, which implies penalizing all banks depending on their non-Brazilian exposure. They argue that country contagion might be rational if investors' expectations of non-Brazilian debt repayment changed.

Although a contagion effect offers an explanation for the excess returns of banks with little exposure, it does not rule out the importance of other confounding variables. One such factor proposed in the literature is the role of the

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[4]Lamy, Marr, and Thompson (1986) refer to the investor contagion hypothesis as the irrelevance of exposure hypothesis.

[5]For a detailed treatment of contagion effect, see Aharony and Swary (1983).

International Monetary Fund (IMF) in providing protection to the major banks involved.

5. <u>IMF Bailout Theory</u>

Lamy, Marr, and Thompson (1986) propose the IMF-Commercial Bank Bailout Theory in the context of the Mexican moratorium event.[6] According to this theory, investors assume that the IMF shields commercial banks from the risk of losses from international lending to prevent collapse of the international financial system. According to this view, IMF is a lender of last resort. Hence, the Mexican moratorium event should have no impact on stock prices of the lender banks.

Billingsley and Lamy (1988) apply the IMF Bailout theory to study the impact of the proposed legislation in 1983 to increase the U.S. quota to the IMF. They argue that the additional U.S. financial support for the IMF implies a greater IMF 'safety-net' against foreign loan losses for the banks and thus should enhance bank value.

6. <u>Federal Bailout Theory</u>

Glascock, Karafiath, and Strand (1986) argue that the informal federal guarantees enjoyed by the eleven multinational banks can be explained within the framework of the Federal Bailout Theory. They cite the example of the bailout of Continental Illinois bank and the statement of the

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[6]Lamy, Marr, and Thompson (1986) also refer to this as regulatory protection hypothesis.

Comptroller of the Currency that the eleven banks were too large to be allowed to fail. They argue that if investors believed that full federal guarantees are extended to the largest eleven banks, then share prices of those banks should not decline as a result of international debt crisis.

7. Market Learning Theory

Viswanathan and Philippatos (1989) compare the impact of the 1982 Mexican moratorium with that of the 1987 Brazilian moratorium. Since several Latin American countries (e.g., Peru, Argentina, Chile) arranged for debt reschedulings subsequent to the Mexican moratorium, they argue that the market should have learned from these events. This learning should result in more accurate assessment of the probability of other Latin American defaults. This hypothesis implies that negative excess returns observed for the Brazilian moratorium event should be attenuated compared to Mexican moratorium event, even though it can be argued that the event could still produce economic impact. This theory in its present form, does not investigate whether learning can be manifested in other variables such as the variance of excess returns and the risk of the portfolio of affected stocks.

8. Bargaining Position Model

Ozler (1989) studies the impact of developing country reschedulings on U.S. bank stocks during the period 1978-1983 and argues that the significance of excess returns is directly related to the relative bargaining positions of the Latin

American countries versus the exposed banks. The proposed model assumes that banks initially operate in a competitive market. When outstanding loans become due, the borrower has the option to default and enter into negotiations for debt-rescheduling. If lenders form a cartel, a bilateral monopoly develops between the lenders and the borrowers. The gain or loss from this confrontation depends on the relative bargaining position of the banks. During 1978-80 the borrowers were illiquid while the banks had a strong bargaining position. The result was positive returns in response to reschedulings during 1978-80. However, during 1981-83, the serious threat of debt repudiation weakened the bargaining position of the banks, resulting in negative returns in response to debt rescheduling announcements.

In summary, each theoretical explanation provided for the specific events related to the Latin American debt crisis focuses on a specific aspect of the debt problem rather than providing a general framework to explain the debt crisis. Another drawback of the studies reviewed is that the regulatory aspect of the banking industry which is traditionally a central aspect of the economics of banking is generally neglected.

B. Empirical Studies on the Latin American Debt Crisis

Although the seriousness of the Latin American debt problem is well recognized both in academic literature and

popular press, there have been relatively few empirical studies on the problem. Empirical studies can be divided into two broad categories: studies on the Mexican moratorium event, and studies on other related events.

1. **Studies on the Mexican Moratorium Event**

The Mexican debt moratorium is the most extensively studied event related to the Latin American debt crisis. Four studies (Schoder and Vankudre 1986, Lamy, Marr, and Thompson 1986, Smirlock and Kaufold 1987, and Bruner and Simms 1987) employ event study analysis to investigate the stock market reaction to the announcement of the Mexican debt moratorium.[7] The analysis consists of two parts:

The first part entails measurement of excess returns of bank stocks around the event day to examine how rapidly the market reacted to new information. This is also a test of the new information hypothesis. Excess returns are calculated using the market model described by Fama *et al.* (1969).

The second part of the analysis tests two alternate hypotheses: the rational pricing hypothesis and the investor-contagion hypothesis. This is done by regressing cross sectional excess returns against the degree of exposure of each bank. It should be noted that bank exposure levels were not publicly known at the time of the Mexican moratorium announcement. Hence, these tests constitute test of strong-

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[7]See Chapter 4 for a description of event study methodology.

form market efficiency.

Schoder and Vankudre (1986) study hour-by-hour reaction of bank stock prices to the Mexican announcement during August 18-20, 1982. They find that money-center/Texas-based banks experienced higher negative excess returns than other exposed banks. They estimate a regression between excess returns and exposure levels and conclude that "stock prices did not correctly reflect the cross-border exposure of individual banks to Mexico." This conclusion suggests either informational inefficiency (strong-form) or a contagion effect. The conclusion of contagion effect is controversial in the light of findings by Aharony and Swary (1983).[8]

One criticism of Schoder and Vankudre's study is that it uses the sum of loan exposure and the foreign exchange exposure to measure the exposure of banks. However, the effect of the moratorium on the two exposures may be different, which would result in specification error and thus biased coefficients.

Smirlock and Kaufold (1987) examine the effectiveness of the mandatory disclosure laws passed in the wake of the

[8]Aharony and Swary (1983) examine the contagion effect in the wake of three bank failures in the 1970s and find that the contagion effect was small and short-lived.

Mexican moratorium.[9] They divide the sample of banks into those exposed to Mexico and those that are not exposed. They measure exposure as Mexican loans divided by the book value of equity. The sample consists of listed firms whose shares are traded continuously (every week) during the estimation period. The continuous trading criterion minimizes the bias in estimating betas that can arise from infrequent trading (Dimson 1979, Scholes and Williams 1977). They argue that since all of the sample firms come from the same industry and are affected by the same event, there may be cross-sectional correlation among the security returns. Hence, they employ the Seemingly Unrelated Regression (SUR) technique to estimate the market model. The results indicate a significant decline in bank stock prices that was proportional to the degree of Mexican exposure. Stock price response was absent for the non-exposed group. They conclude that despite the absence of mandatory disclosure laws, investors were able to distinguish among banks according to their exposure levels. One limitation of this study is that the findings reflect investor knowledge of relative exposure to Mexico and not the assessment of absolute exposure levels.

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[9]After the announcement of the Mexican moratorium the Securities and Exchange Commission and bank regulators required banks to report details of country exposure if loans to a specific country exceed 0.75% of total assets or 15% of primary capital, whichever is less.

Lamy, Marr, and Thompson (1986) test the IMF-Commercial Bank Bailout Theory for the Mexican moratorium event. They divide the sample into exposed and non-exposed banks and measure exposure as the Mexican loans deflated by book value of owners' equity plus loan loss reserve. They obtain the excess returns from the excess returns tape provided by the Center for Research in Security Prices (CRSP). The results indicate that the exposed group had significant negative excess returns and the non-exposed group had significant positive excess returns on the event day. They report significant positive returns prior to the Mexican moratorium announcement and argue that this may be an indication of investor expectation of a lending agreement between Mexico, the IMF, and the Federal Reserve. The subsequent failure to arrive at an agreement may have been viewed as 'bad news'. They contend that the results are consistent with the bailout theory.

Lamy, Marr, and Thompson (1986) also report a significant negative relationship between excess returns and the size of each bank's exposure to Mexico on the event day. They interpret this result as evidence of the market's knowledge of each bank's loan exposure even in the absence of disclosure requirements, implying that the market for U.S. bank shares is strong form efficient. The sample utilized in the regression between excess returns and exposure levels includes both exposed and non-exposed banks. Thus, the regression may be

differentiating between the two groups of banks and not reflecting the marginal effect of increased exposure within the exposed bank group. Other studies (Schoder and Vankudre 1986, and Bruner and Simms 1987) use only the sample of exposed banks in the regression and find no significant relation between exposure and excess returns. Thus, pooling of data among the two groups casts doubt on the validity of conclusions drawn by Lamy, Marr, and Thompson.

Bruner and Simms (1987) attempt to reconcile the conflicting results of the studies by Schoder and Vankudre (1986), Cornell and Shapiro (1986), and Smirlock and Kaufold (1987). They measure exposure as loans to Mexico deflated by the market value of equity and report significant negative returns for both high and low exposure groups on the announcement day. A cross-sectional regression between cumulative excess returns and the Mexican exposure shows a positive, but not significant association on the event day and the next four days. The relationship becomes significantly negative from day +6 to day +9. They attribute the positive association to a temporary investor contagion and argue that, in the absence of publicly available information, investors apparently took longer to discover the Mexican debt exposure levels of individual banks. However, six days is a long time for an effect to be capitalized in an efficient market.

2. Other Studies

Although empirical studies related to the Latin debt problem have focused on the Mexican moratorium, several studies have considered other events such as legislative actions and the announcement of debt reschedulings. A review of these studies follows.

Cornell and Shapiro (1986) estimate cross-sectional regressions of the effect of Latin American exposure on daily, monthly, annual, and biannual returns over the two-year period, 1982-1983. They measure exposure as total Latin American loans divided by total assets. They find that Latin American loan exposure was a significant determinant of annual and biannual returns, but insignificant for monthly and daily returns, including the Mexican moratorium day. They conclude that the results provide support for their "dribs and drabs" hypothesis since the market incorporated the effect of Latin American exposure into the bank stock prices prior to the Mexican announcement. Nevertheless, information arriving on August 18-20 had no material significance.

The time frame adapted by researchers to study the market reaction to specific events is a crucial element of event study analysis. Cornell and Shapiro (1986) argue that an event day cannot be pinpointed in the case of Latin American debt problem and conclude that the standard event study methodology may not be appropriate in this case. Several researchers (e.g., Bruner and Simms 1987) discount this

argument by claiming that the event date effects can be demonstrated. Obviously, observed announcement effect will be attenuated compared to the economic effect of an event in the case of partially anticipated events. But, this does not preclude the possibility of significant event day effects (Malatesta and Thompson 1985).

Glascock, Karafiath, and Strand (1986) examine the impact of five major international defaults and reschedulings (Argentina, Brazil, Chile, Mexico, and Venezuela) in 1982 on the U.S. bank stocks. They divide the sample of banks into three groups: multinational banks, regional wholesale banks, and regional consumer banks. They test three hypotheses: rational pricing hypothesis, pure contagion hypothesis, and federal bailout hypothesis. This study employs the intervention analysis of Box and Tiao (1975). A number of dummy variables are used to capture the effect of the Falkland war and the announcement of defaults and reschedulings. The results indicate that multinational banks and regional wholesale banks show significant negative excess returns on the default day and regional consumer banks show no abnormal performance. The authors conclude that the market was efficient in assimilating the information content of loan defaults and that the results provide strong evidence against the pure contagion hypothesis.

Ozler (1989) studies the impact of announcements of developing country reschedulings on bank stock prices during

the period 1978-1983 employing event study method. The study includes other developing countries besides Latin American countries (e.g., Yugoslavia, Sudan, Nigeria, Poland). It employs a multi-beta asset pricing model to capture the effects of returns to the overall market and industry-specific effects. The results indicate that debt reschedulings had a positive effect on bank returns during 1978-80 and a negative effect during 1981-83. As noted earlier, a bargaining model was proposed as an explanation for these findings.

Two other related studies by Cornell, Landsman and Shapiro (1986), and Billingsley and Lamy (1988) examine the reaction of bank stock prices to legislative actions that took place in 1983. The Mexican crisis resulted in enactment of the International Lending Supervision Act (ILSA) that enhanced U.S. quota to the IMF. The former study examines the dates this legislation was passed while the later study extends the analysis to include the dates that the legislation was introduced in the U.S. Senate and the House. Cornell, Landsman, and Shapiro (1986) and Malatesta and Thompson (1985) argue that the nature of the legislative process is such that it is difficult to isolate and measure the economic impact of a legislative event on stock returns. Hence, Billingsley and Lamy include the dates of various stages (introduction, approval and signing) of the proposed legislation since at each stage investors' uncertainty concerning the impact of the proposed change is progressively lessened. Both utilize an

event study approach and measure excess returns with the market model. Cornell, Landsman and Shapiro conclude that the joint effect of the ILSA and an increased quota for the IMF led to negative returns to bank stocks whereas Billingsley and Lamy arrive at the opposite conclusion. Billingsley and Lamy report that the mean systematic risk of the sample of banks did not change, but there is a significant decrease in unsystematic risk. They conclude that this reduction in unsystematic risk was due to the perception that the IMF would provide a 'safety-net' against foreign loan losses.

Viswanathan and Philippatos (1989) compare the impact of the Mexican and the Brazilian moratoria on bank stock prices. They report significant negative excess returns for Mexican moratorium, but no excess returns for Brazilian moratorium. In the case of Mexican moratorium, the market took six days to price the shares of exposed and non-exposed banks. For the Brazilian moratorium, the high exposure group had positive (but not statistically significant) returns on the event day and negative returns for three days afterwards. They argue that the Brazilian announcement did not convey any new information about the quality of Latin American assets held by the banks probably because it was well anticipated.

Musumeci and Sinkey (1990a) analyze the Brazilian moratorium event and test hypotheses similar to those of Bruner and Simms (1987). Since country exposure figures were publicly available at the time of the Brazilian moratorium,

the event study analysis is a test of semi-strong form efficiency. The results indicate significant negative excess returns for banks with Brazilian debt and a negative relation between exposure and excess returns.

Musumeci and Sinkey (1990a) also test a financial strength hypothesis. They hypothesize that the stronger a bank's capital position, the more resistant it should be to bad news. To test this proposition, they regress cross-sectional excess returns against each bank's ratio of market value of common equity to total assets. Results indicate that the capital variable is positive and significant for event day excess returns. However, when the book value of total equity (which includes preferred stock) is used in the regression, the capital variable is not statistically significant.

They also compare changes in bank equity values with changes in the market prices of the Brazilian debt. They conclude that changes in bank equity values are positively related to the change in the value of Brazil's traded debt.

Musumeci and Sinkey (1990b) examine security returns for U.S. banks around Citicorp's announcement of loan-loss-reserve enhancement in May 1987. Using event study method, they report positive and significant abnormal returns for Citicorp and other banks. They test four alternative forms of new information hypotheses: loan quality, tax savings, capital structure, and corporate restructuring hypotheses. They argue that although loan-loss-reserve provisions are accounting

adjustments, they affect stock prices because they signal economic value-enhancing corporate restructurings.

C. Chapter Summary

This chapter reviews the literature on various hypotheses and empirical studies proposed to explain the impact of Latin American debt problem on the U.S. bank share prices. The empirical studies on Mexican moratorium event arrive at diverse conclusions. However, there is no general theoretical framework in the existing literature to reconcile these conflicting results. The regulatory aspect, especially capital regulation of the banking industry, is generally ignored in the theories.[10] Most of the studies analyze a single event and cannot evaluate the generality of the results.[11] The analysis of debt crisis is limited to the U.S. banks, despite the fact that the problem has international ramifications.

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[10]Although Musumeci and Sinkey (1990a) mention capital adequacy in analyzing the Brazilian moratorium event, it is not the focus of their article and, hence, is not developed in detail.

[11]An exception is Viswanathan and Philippatos (1989) who compare the Mexican and Brazilian moratoria.

Table 2.1

Theories Proposed to Explain Specific Events of the Latin American Debt Crisis

Theory/Hypothesis	Authors
1. New Information Hypothesis	Schoder and Vankudre (1986) Smirlock and Kaufold (1987) Bruner and Simms (1987) Viswanathan and Philippatos (1989) Musumeci and Sinkey (1990 a,b)
2. Information Leakage Hypothesis	Cornell and Shapiro (1986)
3. Rational Pricing Hypothesis	Schoder and Vankudre (1986) Smirlock and Kaufold (1987) Bruner and Simms (1987)
4. Contagion Hypotheses	Glascock, Karafiath, and Strand (1986) Bruner and Simms (1987) Musumeci and Sinkey (1990a)
5. IMF Bailout Theory	Lamy, Marr, and Thompson (1986) Billingsley and Lamy (1988)
6. Federal Bailout Theory	Glascock, Karafiath, and Strand (1986)
7. Market Learning Theory	Viswanathan and Philippatos (1989)
8. Bargaining Position Model	Ozler (1989)

CHAPTER 3

DESCRIPTION OF EVENTS AND DATA

The Latin American debt problem provides an excellent opportunity to analyze the longitudinal impact of multiple events as shocks to banking system. An important feature of the problem is that an event like the Mexican moratorium was followed by similar actions from Argentina, Bolivia, and Brazil. This allows the possibility of extending the explanatory ability of the proposed theories by replication and generalization. Another interesting aspect of the Latin American problem is that it affected not only the U.S. banking industry but also the British and the Canadian banks due to their substantial concentration on Latin American borrowers. This permits study of international differences in capital adequacy and access to capital markets.

A careful selection of events incorporating all the unique features cited above is thus crucial to the study of debt problem. The description of events selected for detailed study is the subject of this chapter. Section A examines the information content of each event and its perceived *a priori* impact on the stock prices of the affected banks. Section B outlines the differences in the institutional environment that characterize the three banking systems. Section C describes the sample of the U.S., U.K., and Canadian banks used in the

study. The last section summarizes the chapter.

A. Description of Events

The list of events selected for detailed analysis and the corresponding event dates are shown in Table 3.1. The list consists of twelve events reflecting several dimensions of the debt problem as discussed above.

To facilitate generalization of the results, the events are classified into four categories: (1) borrower-induced events, (2) lender-induced events, (3) events initiated by both borrower and lender jointly, and (4) events which are exogenous to the borrower-lender relationship.

Borrower-induced events are those initiated by the Latin American countries. The moratoria declared by Mexico, Argentina, Bolivia and Brazil constitute this category. A typical feature of borrower-induced events is their likely impact on the entire group of banks with Latin American loans.

Lender-induced events relate to the actions taken by banks in response to the debt situation. The loan loss provision made by Citicorp is the sole example of events which are lender-induced. Unlike borrower-induced events, the lender-induced events may or may not affect the other banks.

Events initiated by both borrower and lender reflect agreements arrived at mutually. The debt-rescheduling agreement between Mexico and the creditor banks is the only event of this category.

The last category comprises events that are external to the borrower-lender relationship, but may affect the bank stock prices. The Falkland war, legislative actions, Cartagena declaration, Peru's declaration, Baker plan and oil price slump comprise this category.

One major difference characterizes the first three categories of events on the one hand and the last category on the other. Events of the first three types involve optimization decisions by the borrower or lender or both jointly. Thus, in the case of Mexican moratorium event, the Mexican government has two choices: either to continue servicing the debt or to declare a moratorium on debt repayment. The government weighs the two choices and makes that decision that maximizes its social utility function. On the other hand, the last category of events does not involve decision making by the borrowers or lenders. In that sense, the events are external to the system.

The events are selected in such a way that they are almost evenly distributed in time. The chronological distribution of the events in Table 3.2 shows that there are two events each year during 1984-1987, three in 1982, and one in 1983. A brief description of each event follows.

1. Borrower-Induced Events

<u>Mexican Moratorium</u> (August 1982)

In August 1982, the Mexican government declared a

suspension of interest and principal payments on its $80 billion foreign debt. The Mexican debt moratorium is often considered the commencement of the international debt crisis. The U.S. banks account for about 70% of the $60 billion debt owed by Mexico to foreign banks. Hence, the implications of a possible Mexican default to the U.S. banks are overwhelming. The fragility of the U.S. banking system prompted fears about possible run on the banks as a consequence of the Mexican moratorium. Since the Mexican moratorium was the first major shock of its kind, this event may be expected to result in significant negative excess returns for the banks exposed to Mexico.

Though the Mexican debt crisis is the culmination of several internal and external forces, three factors contributed significantly to the problem. These are: (1) the rise in real interest rates in the early 1980s, (2) the adverse terms of trade, and (3) the faulty economic policies followed by Mexico. The weakening oil market in 1981 contributed significantly to Mexico's balance of payment problem since oil constituted about 70% of Mexico's exports.

In early 1982, Mexico's situation deteriorated rapidly. In February 1982, the peso plunged 28% against the dollar resulting in the decision to let the currency float. Inflation increased from 35% to 60% in 1981. In June 1982, Mexico's primary international reserves plummeted by $1.5 billion in five months. In early August 1982, the government

established two exchange rates for the peso: a floating rate for most transactions, and a "preferential" rate for crucial imports and interest payments on foreign debt. The situation worsened with the government closing the foreign-exchange markets on August 16. Finally, on August 19 the moratorium on all foreign debt was announced.[1]

<u>Argentinean Moratorium</u> (September 1982)

On September 3, 1982, the *Wall Street Journal* (WSJ) reported that a strong rumor swept through the financial markets on the previous day that Argentina would default on its external debt and nationalize the banks. The rumor sent gold prices soaring to the highest level in 11 months. Argentina, with a foreign debt of $39 billion, is the third largest debtor. This event occurred two weeks after the Mexican moratorium, thus providing an opportunity to generalize theoretical explanations of the Mexican moratorium event.

<u>Bolivian Moratorium</u> (May 1984)

The WSJ (5/31/1984) reported that on May 30, 1984, commercial banks voiced concern over rumors of Bolivian default of its external debt. On May 31, Bolivia officially announced suspension of payments because of economic difficulties. The $3.7 billion external debt of Bolivia is insignificant compared to that of the big three (Argentina,

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[1]Kraft (1984) provides an excellent discussion of events leading to the Mexican moratorium.

Brazil, and Mexico account for $287 billion). Hence, this event should have very little impact on bank stock prices. However, if investors perceived that the announcement of Bolivian moratorium indicated impaired value for the entire Latin American loan portfolio (irrespective of the nature of the individual borrowing countries), then this event will result in negative excess returns similar in magnitude to those for the Mexican moratorium event. Thus, an issue is whether to consider the entire debt of Latin America or the debt of individual countries in measuring the impact of debt crisis on bank stocks. Two studies (Schoder and Vankudre 1986, and Cornell and Shapiro 1986) use the total Latin loans outstanding as a measure of exposure whereas two other studies (Smirlock and Kaufold 1987, and Bruner and Simms 1987) employ only the Mexican loans outstanding. This study explores both possibilities, that investors are sensitive to total Latin American loan exposure or, alternatively, they differentiate the debtors on individual basis.

<u>Brazilian Moratorium</u> (February 1987)

On February 20, 1987, Brazil unilaterally suspended interest payments on its external debt. Brazil, with a total foreign debt of $108 billion, is the world's largest debtor country. Brazil's economic performance was so spectacular that bankers considered Brazilian moratorium a remote possibility. Brazil recorded three years (1984-86) of high domestic growth resulting in annual trade surpluses of about

$12 billion. The economy enjoyed the benefits of lower oil prices and lower international interest rates. The moratorium announcement, thus, came as a grim remainder that the debt crisis was not over.

The crisis in the Brazilian economy was the consequence of internal policy snags and not global shocks (Cline 1987). The main cause was the sudden collapse of exports in the fourth quarter of 1986. Unlike the Mexican moratorium event which was preceded by a lot of activity (e.g., devaluation of peso, closing of foreign exchange markets), the Brazilian moratorium announcement had a strong element of surprise.

2. Lender-induced Events

Citicorp's Loan-Loss Provision Enhancement (May 1987)

On May 19, 1987, Citicorp announced a provision of $3 billion against its loans to developing countries that had been experiencing debt-servicing difficulties. This sudden action meant that Citicorp would report a loss of $2.5 billion for the second quarter of 1987, effectively wiping out its 1987 profit. However, increasing loan loss reserves is only an accounting adjustment and should not have any effect on the value of the banks concerned.

Market reaction to Citicorp's action may be theorized as positive due to several reasons. The action was described by the U.S. government officials as a sign of strength. It not only reduced uncertainty among investors but also earned the

bank more bargaining power in negotiations with its troubled debtors. Standard and Poor Corporation described the decision as "a positive response to a deteriorating situation". This move also brought Citicorp's reserve protection more in line with its international peers "restoring confidence in the integrity of its balance sheet" (WSJ 5/20/1987). In summary, it is suggested that market reaction to CitiCorp's announcement would result in positive excess returns.

Although Citicorp's decision is classified as a firm-specific event, there may be industry wide response due to Citicorp's preeminent position in the banking industry. Citicorp was the largest lender to developing countries and it had played a leading role in many debt rescheduling negotiations. Subsequent to Citicorp's action, other major U.S., British and Canadian banks with Latin American loans boosted their loan-loss reserves. Immediately following Citicorp's announcement, the Bank of England urged British banks to step up efforts to increase their loan-loss reserves for Third World debt (WSJ 5/21/87). The market response to Citicorp's announcement on a firm-specific or industry-wide level is an empirical question to be addressed in the study.

3. Events Initiated by Borrower and Lender

Debt-Rescheduling Agreement Between Mexico and Banks

(September 1986)

Since the declaration of moratorium by Mexico in 1982,

there have been numerous debt-rescheduling agreements between Mexico and the creditor banks. However, the rescheduling agreement signed in September 1986 is crucial since it set a precedent for other countries to follow.

Two devastating earthquakes in September 1985 and the slump in oil prices between November 1985 and April 1986 jolted the Mexican economy. After months of disrupted talks with the IMF on an economic program, Mexico reached an agreement with the IMF in July 1986 and with its commercial bank creditors on September 30, 1986. The rescue package provided for additional loans of $12 billion, half from the international development banks and half from the private banks. The terms were the most lenient to be extended to a major debtor, with an interest margin of less than 1% above the London InterBank Offered Rate (LIBOR). The commercial banks agreed to restructure $43 billion debt over a period of 20 years with a seven year grace period. The agreement also envisaged an additional $1.7 billion in loans in case of further deterioration in the Mexican economy.

Although the agreement was hailed as a model for other debtor countries, its usefulness is questionable from the investors' point of view. The decrease in interest margin may result in lower earnings for the banks. Investors may also feel skeptical over the commitment of banks for additional lending and the long maturity period of the existing loans. Hence, the expected effect for this event is ambiguous.

4. External Events

Falkland War (1982)

The Falkland War had a dramatic impact on the Argentinean economy and significantly impaired Argentina's ability to repay its foreign debt. Although the Falkland war spans a rather lengthy period between April 2, 1982, and June 22, 1982 and encompasses a number of events, the following dates are identified as relevant for analysis in this study:

April 2- Argentina invaded the Falklands.

April 3- The British government imposed economic sanctions and froze Argentinean deposits in London Banks.

May 3- An Argentine cruiser was sunk with 1852 men on board.

May 4- A British destroyer was sunk.

May 5- Argentina devalued its peso by 14.3 percent.

This event preceded the Mexican moratorium announcement which is often considered the commencement of the international debt crisis. Analysis of this event provides insights regarding investor perceptions of the impending crisis with the Latin American loans.

Legislative Actions (1983)

The Mexican debt crisis of 1982 triggered a national debate on the role of regulation governing foreign activities of the U.S. banks and resulted in enactment of the International Lending Supervision Act (ILSA) in 1983. The Act has two important features. First, it established a

comprehensive and uniform regulatory framework guiding the foreign operations of the U.S. banks. The provisions of the Act include, among other things, disclosure of detailed data on country exposure, establishing a special Allocated Transfer Risk Reserve against certain categories of international assets, and relating capital adequacy to country exposure. The ILSA marks the first successful effort to directly supervise the concentration of foreign loans in bank portfolios.

The second feature of ILSA is the increase in the U.S. quota in the International Monetary Fund (IMF) by $8.4 billion and an expansion of the IMF's General Arrangements to Borrow. U.S. support for the IMF was important because the IMF's resources were dangerously low, and it is an indication of a positive change in the U.S. administration's attitude towards the international financial institutions (Pastor 1987). The IMF is often considered as a 'lender of last resort' (e.g., Lamy, Marr, and Thompson 1986). Billingsley and Lamy (1988) argue that bank stockholders may view greater U.S. support for the IMF as an increase in the extent to which the IMF can subsidize their bank's international loan risk exposure. Thus, the net effect of ILSA on bank stock prices is determined by stockholders' perception of the trade-off between the benefits of increased IMF quota and the new restrictions that international lending is subjected to. Analysis of this event includes the dates of introduction and

passage of the relative bills in the House or the Senate. The following event dates are identified (these are the same dates used by Billingsley and Lamy 1988):

7 March 1983	Introduction of S.695: Proposal to increase the U.S. quota to IMF
5 May 1983	Introduction of International Recovery and Financial Stability Act (H.R. 2930)
10 May 1983	H.R. 2957 introduced. Continuation of H.R. 2930
8 June 1983	S. 695 passed by the Senate
3 August 1983	H.R. 2957 passed by the House. House passes S. 695
17-18 November 1983	H.R. 3959 passed: supplemental appropriations bill covering the ILSA and increased U.S. quota to the IMF
30 November 1983	President signs legislation into law

<u>Cartagena Declaration</u> (June 1984)

The foreign and finance ministers of eleven Latin American nations with large external debts met at Cartagena (Bolivia) to discuss the debt crisis. They maintained that the Latin American debt problem was largely due to factors beyond the control of the debtor countries, namely, drastic changes in world interest rates, and a decline in commodity prices. They called on industrialized countries and commercial banks to share the burden of resolving the international debt crisis. The proposals of the meeting include:

a) that renegotiation of external debts should not compromise

export revenues beyond reasonable percentages.

b) that debtor countries should be granted much longer terms and more preferential interest rates in the renegotiation of their debts.

The Cartagena declaration is an important event in the debt crisis in the sense that for the first time all the Latin American debtors presented a joint front. However, they shied away from calling themselves a debtors' cartel (WSJ 6/22/1984) and stated that each country is responsible for the negotiation of its own external debt. They reiterated their intention to fulfill their pledges regarding their external debts.

The impact of this event on bank stock returns is difficult to predict. The call for reduction of interest rates and preferential terms in negotiations might prolong uncertainty for a long time. However, investors are reassured by the absence of a debtors' cartel and the promise to fulfill the debt obligations by the Latin American countries. The effect of this event on bank stock prices is determined by the interaction of these positive and negative factors.

Peru's Declaration (July 1985)

Alan Garcia, Peru's president-elect, announced at his inauguration in July 1985 that Peru would not pay more than 10 percent of the value of its annual export earnings towards the servicing of external debt. He tried to persuade his fellow presidents to support and adopt his proposal. Peru's

declaration represented a shock to the markets, *albeit* not as severe as a moratorium. Hence, negative returns may be expected.

Baker Plan **(October 1985)**

The U.S. Treasury Secretary, James Baker III, proposed a plan to resolve the debt crisis at the IMF/World Bank annual meeting on October 8 in Seoul, South Korea. The plan called for a tripartite strategy for dealing with the debt problem: structural adjustment by debtor countries, additional lending by banks, and financial support from international agencies and industrial country governments. In concrete terms, the plan envisages net new lending of $20 billion in bank loans to the developing countries for the next three years, and adoption of less statist, more export-oriented policies (including trade liberalization and encouragement of foreign investment) by the debtor countries.

The importance of the Baker plan lies in its timing. It signified a positive response from the U.S. government at a time when the political and financial strains were intensifying in Latin America. The Latin American countries ('Cartagena Group') were trying to adopt a unified approach to the debt problem. In July 1985, the President of Peru stated that he would limit debt repayments to 10% of Peru's export earnings. In September 1985, the Mexican President predicted a renewed debt crisis unless a 'new formula' was found for dealing with Latin American debtors (WSJ 9/10/1985). The U.S.

Government seized the initiative by launching the Baker plan in October 1985. Hence, positive excess returns may be expected from this event.

Slump in Oil Prices (February 1986)

The price of oil declined dramatically between November, 1985, and April, 1986--from more than $30 a barrel to $11.30 a barrel--a decline of 64 percent. In February 1986, Mexico and Venezuela slashed their oil prices by as much as $4 a barrel in a bid to remain competitive in the world market. They called for an emergency meeting of the Cartagena group to discuss ways to ease the region's $360 billion foreign debt (WSJ 2/3/1986). Both Mexico and Venezuela rely heavily on oil revenue to service their debt. Oil accounts for about 75% of Mexico's foreign exchange earnings. The collapse in oil prices translates to a loss of about $7 billion in oil revenues for Mexico in 1986. International bankers expected Mexico to demand new loans and interest concessions.

This is an unanticipated and external event. The dramatic collapse in oil prices derailed the Baker plan (announced in October, 1985) even before it was given a trial. This event can have a very differential impact on debt crisis. It should help the oil importers (Brazil and Argentina) and hurt oil exporters (Mexico and Venezuela). For example, Mexico experienced a loss of about $7 billion in oil revenue while Brazil had a windfall gain of about $6 billion from lower oil prices. Thus, banks having large amounts of loans

to Brazil and Argentina should experience positive returns while those having heavy loans to Mexico and Venezuela should have negative returns.

B. Institutional Background

1. U.S. Banks

The U.S. banking system is characterized by a large number of banks (nearly 15,000) compared to other industrialized countries. Banks in the U.S. are highly regulated. Banks may obtain charters from either the federal government or the state government. The important regulatory agencies are: Federal Reserve Board, Federal Deposit Insurance Corporation, Comptroller of the Currency, and state agencies. Regulation takes the form of restricting, among other things, the entry of new institutions, consolidation of existing institutions by mergers and acquisitions, the types of products they may offer, and branching across state lines, and establishing minimum reserve and capital ratios. Banks are prohibited from non-banking activities such as underwriting corporate securities. There are limits to the amount that banks can lend to an individual borrower.

2. British Banks[2]

In England there is no legal definition of a bank. There are certain laws that refer to particular activities and the

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[2]Source: Mastropasqua (1978).

banks are only recognized as such within the limits set up by these laws.[3]

The main categories of the British banks are:

i) the deposit banks, 18 in number;

ii) the accepting houses, 29 in number; and

iii) the overseas banks, the consortium banks and the foreign banks forming a total of about 200.

Amongst the British banks, the London "big four" (National Westminster Bank, Midland Bank, Barclays Bank and Lloyds Bank) occupy a special place due to their enormous network of agencies and deposit accounts.

There is no limitation to the opening of agencies (branches) by banks registered in England. Also, there is no restriction on opening of branches abroad by British banks.

An important characteristic of the British banking system is the flexibility of relations between the monetary authorities and the credit institutions. These relations are typically governed by "moral persuasion" and "gentlemen's agreement". The Bank of England's control over banks is traditionally personalized and participative due to the lack of legislative sanctions. The Bank of England has been reluctant to impose a system of rigid ratios uniformly on all banks. Instead, it prefers to tender advice to each bank on

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[3]To be a banker a significant proportion of the business must consist of conduct of current accounts, and collection and payment of cheques (Cf. United Dominions Trust vs. Kirkwood 1965).

the relation between capital and reserves and their employment. An important difference between the American and the British banking systems is that both bonds and equity are recognized by U.K. supervisors as capital.

3. Canadian Banks

The Canadian banking system is governed by the Bank Act. A unique aspect of Canadian banking law is that it expires at the end of every 10 years, thus enabling a systematic and comprehensive review of banking laws on a regular basis. Under the Bank Act charters can be granted to financial institutions to operate as banks. The 1980 revision of the Bank Act allows foreign banks to operate in Canada, but they are subject to a variety of regulations, limitations, and reciprocal arrangements. For example, the total assets of all foreign banks operating in Canada cannot exceed 8% of total domestic assets of all banks in Canada.[4]

There are two classes of banks in Canada: Schedule A banks (also called Chartered banks) and Schedule B banks. Schedule B banks have the same general powers as Schedule A banks, but are subject to additional restrictions regarding size and branch offices. The big five chartered banks are the Royal Bank, Canadian Imperial Bank of Commerce, Bank of Montreal, Bank of Nova Scotia, and Toronto Dominion Bank. Commercial banks offer a wide range of retail and wholesale

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[4]Source: George and Giddy (1983).

banking services. There is no restriction on the amount that Canadian banks can lend to a single borrower.

Canadian banks are regulated by the Inspector General of Banks. There are fewer restrictions on Canadian banks compared to banks in other countries. Like U.S. banks, they are not allowed to underwrite corporate equities. However, they can purchase stock up to a maximum of 10 percent of any Canadian firm.[5]

The equivalent of primary capital is the base capital in Canada. However, the base capital ratios of Canadian banks are not directly comparable to those of U.S. banks because of differences in calculation. Unlike U.S. banks, Canadian banks cannot include reserves for possible loan losses in base capital. Investments in affiliated corporations are deducted from the base capital. Another restriction is that the components of base capital represented by items other than common shareholders' equity may not exceed 20% of total base capital. Also, the off-balance sheet items (letters of credit and guarantees) are added to the asset base to calculate the base capital ratio. Because of a more conservative approach in defining base capital, the capital ratios of Canadian banks are generally lower than those of U.S. banks.

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[5]Source: Madura (1989)

C. Data Description

1. U.S. Banks

The sample consists of the set of banks or bank holding companies (BHCs) listed on either the New York or the American Stock Exchanges. The list of firms used in the study are shown in Table 3.3. The sample consists of 67 firms out of which 60 are listed on the New York Stock Exchange and 7 on the American Stock Exchange. Out of 67 firms, 40 are common to all events, that is, daily return data are available throughout the study period (1982-1987). Since the remaining firms are either listed or delisted during the study period, the sample size varies for each event. To be included in the sample for any event, the firm should have sufficient daily returns available for the event to permit estimation of the market model. Daily return data are obtained from the CRSP tapes.

Data on the dollar amount of loans to Mexico, Brazil, and Latin America are obtained from the annual reports and 10-K reports filed by the banks involved. The exposure of each bank to Mexico/Brazil/Latin America is measured as the ratio of the quantity (face value) of loans to Mexico/Brazil/Latin America divided by the market value of bank equity. The market value of equity is calculated as the number of shares outstanding prior to the relevant event multiplied by the price of shares eleven days prior to the event. The degree of exposure of the sample banks to Latin America at the time of

Mexican, Bolivian, and Brazilian moratoria are presented in Table 3.4. It can be seen from the table that there is a progressive decline in bank exposure levels.

The sample is subdivided into three groups according to the level of exposure to Latin America: high exposure banks, medium exposure banks, and zero exposure banks. Banks with exposure above the mean exposure of the sample of exposed banks are categorized as high exposure group, and those below the mean exposure form the medium exposure group. The definition of high- and medium-exposure is arbitrary. For example, Bruner and Simms (1987) use the median exposure ratio to sort banks into high- or low-exposure groups. Notwithstanding the subjectivity in the determination of the cut off point, most of the money-center banks and other big banks comprise the high exposure group. A discrepancy arises only in the case of a few banks. Hence, the results of the study would not be materially altered due to this problem.

The zero exposure group functions as a control group to isolate industry-specific effects. The arrival of information pertinent to the entire industry at the market during the event period should affect all the three groups. On the other hand, the information content of the events considered in this study should affect only the banks with Latin American exposure and not the zero exposure group. Thus, the zero exposure group is useful to distinguish industry-wide events from the events related to the Latin American debt problem.

The *Wall Street Journal* is used to identify any firm-specific events during the event period. Firms with significant contaminating events during the period immediately before or after events of interest are excluded. For example, three banks--Bancal Tristate Corp., Depositors Corp., and Union Commerce Corp.-- were eliminated for the Mexican moratorium event because they were targets of takeover bids and had abnormally high stock returns during the event period.

Tables 3.5 and 3.6 present descriptive statistics of the sample of U.S. banks with Latin American debt for the years 1982 and 1986. In 1982, the mean Latin American exposure of the sample as a percentage of the market value of equity is 292%. For high exposure banks, the mean ratio is 482%. By 1986, the exposure level has dramatically declined for medium exposure banks from 197% to 40%, whereas for the high exposure group, the ratio is still high at more than 200%. Although the ratio of Latin loans to equity has decreased in absolute terms, the average amount of Latin American loans for the entire group has increased from $1799 million to $2118 million. The primary capital ratio has gone up from 5.6% to 7.3%. For high exposure banks, the improvement is more spectacular-- from 4.6% in 1982 to 7.3% in 1986-- an increase of about 60%. In 1986, the primary capital ratio of both high- and medium-exposure banks are equal. Another interesting observation is the discrepancy between the book value and the market value of equity for the sample of banks.

In 1982, the market value of equity is about half of the book value. In 1986, the two values are almost equal.

2. British Banks

The sample of British banks consists of five banks: Barclays bank, Lloyds bank, Midland bank, National Westminster bank, and Standard Chartered bank. The loan exposure of the U.K. banks to Latin America in 1983 and 1986 is shown in Table 3.7. The mean exposure of the U.K. banks in 1983 is more than 100% of their capital. However, it is much less than the 1982 mean exposure of the U.S banks at 292%. In 1986, the exposure levels of the U.S. and the U.K. banks are comparable. Among the British banks, the Lloyds bank and the Midland bank have considerably higher exposure levels. The daily price data for the British banks are obtained from the *London Financial Times*. The FTSE All Share index is used as a proxy for the market index.

3. Canadian Banks

The sample of Canadian banks consists of six banks: Bank of Montreal, Bank of Nova Scotia, Canadian Imperial Bank of Commerce, National Bank of Canada, Royal Bank of Canada, and Toronto Dominion Bank. These six banks account for more than 90% of the total domestic assets held by the Canadian banks. Table 3.8 shows the Latin American loans as a percentage of total assets and bank capital for the Canadian banks. The exposure of the Canadian banks in 1983 is about 200% of capital or 7.1% of assets. By 1986, the Canadian banks

reduced their exposure level to 132% of capital or 6.0% of assets, although the absolute level of Latin American loans increased from Cdn.$3614 million to Cdn.$4010 million--an increase of 11%. Because of the conservative definition of capital, the exposure of Canadian banks as a percent of capital appears to be higher than what it would be if the U.S. capital standards are applied. Thus, the exposure levels of the Canadian banks may be comparable to the medium exposure group of the U.S. banks.

Daily stock price data for the Canadian banks are collected from the *Wall Street Journal*. The return on the equally-weighted index of the Toronto Stock Exchange is used as the market return.

D. Chapter Summary

This chapter identifies twelve events for detailed analysis. The events are classified into four categories: (1) borrower-induced events, (2) lender-induced events, (3) events initiated by borrower and lender jointly, and (4) events exogenous to the borrower-lender relationship. A brief description of each event and its hypothesized impact on bank stock prices are provided. A preliminary analysis of the sample of banks shows that the American, the British, and the Canadian banks are comparable in terms of their level of exposure to Latin America.

Table 3.1

Sample of Events

Event	Date	Type*
1. Falkland War		E
(a) Commencement of war	04/02/82	
(b) Devaluation of Peso	05/05/82	
2. Mexican moratorium	08/19/82	B
3. Argentinean moratorium	09/02/82	B
4. Legislative actions		E
(a) Introduction of S. 695	03/07/83	
(b) Introduction of H.R. 2930	05/05/83	
(c) Introduction of H.R. 2957	05/10/83	
(d) S. 695 passed by the Senate	06/08/83	
(e) S. 695 and H.R. 2957 passed	08/03/83	
(f) H.R. 3959 passed	11/17/83	
(g) President signs legislation	11/30/83	
5. Bolivian moratorium	05/31/84	B
6. Cartagena declaration	06/21/84	E
7. Peru's declaration	07/29/85	E
8. Baker Plan	10/07/85	E
9. Slump in oil prices	02/04/86	E
10. Debt-rescheduling by Mexico	09/30/86	J
11. Brazilian moratorium	02/23/87	B
12. Citicorp's loan loss provision	05/19/87	L

* B = Borrower-induced event
L = Lender-induced event
J = Event induced by borrower and lender jointly
E = Exogenous event

Table 3.2

Chronological Distribution of Events

Year	Number of Events
1982	3
1983	1
1984	2
1985	2
1986	2
1987	2

Table 3.3

Sample of U.S. Banks

Bank	Ticker Symbol	Start date	End date#	Exch*
Amsouth Bancorp	ASO	810520	-	1
Banc One Corp	ONE	830929	-	1
Bancal Tri State Corp	BCL	700109	840618	1
Bank of Boston Corp	BKB	710107	-	1
Bank New York Inc	BK	691204	-	1
BankAmerica Corp	BAC	760628	-	1
Bankers Tr NY Corp	BT	690516	-	1
Barnett Banks Inc	BBI	791217	-	1
Chase Manhattan Bank	CMB	650315	-	1
Chemical NY Corp	CHL	690305	-	1
Citicorp	CCI	681101	-	1
Citizens First Bancorp	CFB	781227	-	2
Continental Ill. Corp	CIL	730910	-	1
Crocker Natl. Corp	CKN	701209	850524	1
Depositors Corp	DEP	680725	840228	2
Equimark Corp	EQK	710720	-	1
Fidelity Un Bancorp	FDU	710510	840404	1
First Atlanta Corp	FAC	810630	851204	1
First Bank Sys Inc	FBS	840507	-	1
First Bankers Corp Florida	FBF	801027	860516	1
First Chicago Corp	FNB	711230	-	1
First City Bancorp Texas	FBT	761201	-	1
First Fidelity Bancorp	FFB	710517	-	1
First Interstate Bancorp	I	620702	-	1
First Penn Corp	FPA	720110	-	1
First Republicbank Corp	FRB	760923	-	1
First Virginia Banks Inc	FVB	710419	-	1
First Wachovia Corp	FWB	851223	-	1
First Wisconsin Corp	FWB	710913	-	1
First Wyoming Bancorp	WYO	730208	-	2
Fleet Finl. Group Inc	FLT	681115	-	1
General Bancshares Corp	GBS	620702	860327	1
Guarantee Bancorp	GB	791227	840117	2
Harris Bancorp	HBC	760421	840904	1
Horizon Bancorp	HZB	800523	-	1
Interfirst corp	IFC	730511	870605	1
Irving Bancorp	V	680923	-	1
Keycorp	KEY	830527	-	1
Landmark Bancshares Corp	LBC	841121	-	1
Mcorp	M	770914	-	1
Manufacturers Hanover Corp	MHC	690428	-	1

Table 3.3 (contd.)

Bank	Ticker Symbol	Start date	End date#	Exch*
Marine Midland Banks Inc	MM	620702	871215	1
Mellon Bank Corp	MEL	810710	-	1
Money Management Corp	MGT	760427	860630	2
J.P. Morgan	JPM	690401	-	1
NCNB Corp	NCB	790605	-	1
NBD Bancorp	NBD	730221	-	1
Norstar Bancorp	NOR	820104	-	1
Northeast Bankshares Assn.	NBA	790124	830531	2
Northwest Bancorp	NOB	621210	-	1
Pan American Banks Inc	PAB	810819	851230	1
Republic NY Corp	RNB	720112	-	1
Seafirst Corp	SFC	771209	830701	1
Security Pacific Corp	SPC	790314	-	1
Signet Banking Corp	SBK	710106	-	1
Southeast Banking Corp	STB	720807	-	1
Southwest Florida Banks Inc.	SFB	780111	840531	1
Sterling Bancorp	STL	620702	-	1
Sun Banks Inc	SU	810821	850628	1
Suntrust Banks Inc	STI	850701	-	1
Texas Amern. Bancshares Inc	TXA	820623	-	1
Texas Commerce Bancshares	TCB	740919	870430	1
Union Commerce Corp	UCM	720515	830330	1
United Jersey Banks	UJB	701123	-	1
Wachovia Corp	WB	700302	851204	1
Wells Fargo	WFC	700209	-	1
Worthen Banking Corp	WOR	830815	-	2

* Exchange 1 = NYSE; 2 = AMEX

'-' indicates that the firm is listed on the exchange beyond 871231.

Table 3.4

Latin American Debt Exposure* of U.S. Banks

Bank	Exposure at the time of moratorium by		
	Mexico	Bolivia	Brazil
Amsouth Bancorp	0.3636	0.2002	0
Bancone Corp	-	-	0
BankAmerica Corp	2.8573	2.5087	4.0943
Bank Calif NA	-	1.1557	-
Bank of Boston	1.7295	1.4198	0.5896
Bank New York Inc.	2.1326	1.4527	0.3426
Bankers Tr NY Corp	3.2949	2.4385	0.8569
Barnett Banks Fla Inc	0	0	0
Chase Manhattan Bank	5.4043	4.0042	2.1739
Chemical NY Corp	6.0438	3.8745	2.1177
Citicorp	3.3762	2.8673	1.5043
Citizens 1st National Bank	0	0	0
Continental Ill. Corp	3.4370	-	3.5452
Crocker Natl. Corp	5.3562	5.0584	0
Depositors Corp	0	-	-
Equimark Corp	3.9382	-	0.3264
Fidelity Un Bancorp	0	-	-
First Atlanta Corp	0.8978	0.3343	-
First Bankers Corp Florida	0	0	-
First Chicago Corp	3.9934	2.5306	1.4260
First City Bancorp Texas	0.5042	0.4995	-
First Intl. Bancshares	0.4416	0.4649	1.2673
First National St. Bancorp	1.2612	0.7421	0.1849
First Penn Corp	11.8103	5.3153	2.0370
First Virginia Bankshares	0	0	0
First Wisconsin Bankshares	4.6760	1.9284	0.6478
General Bancshares Corp	0	0	-
Guarantee Bancorp	0	-	-
Harris Bancorp	1.8905	0.6098	-
Horizon Bancorp	0	0	0
Industrial Bancorp	1.0967	0.4750	0.1068
Irving Bancorp	7.7023	4.1474	2.0460
Keycorp	-	-	0
Landmark Bancshares Corp	-	-	0
Manufacturers Hanover	7.4659	6.5300	4.3558
Marine Midland	4.8407	3.7812	1.7603
Mellon National	2.3902	1.6327	0.9936
Mercantile Texas	0.3625	0.3061	0.4611
Money Management Corp	0	0	0
J.P. Morgan	2.1684	1.5816	0.7561
NCNB Corp	0.7516	0.3121	0.7842
NBD Bancorp	1.1851	0.5161	0.1997

Table 3.4 (contd.)

Bank	Exposure at the time of moratorium by Mexico	Bolivia	Brazil
Northeast Bankshares	0	-	-
Norstar Bancorp	-	0	0
Northwest Bancorp	0.8392	0.5107	0
Pan American Banks	-	0	-
Republic National Bank NY	6.3868	3.3609	0.6876
Republic Texas Corp	1.3506	0.9755	1.5002
Seafirst Corp	2.8590	-	-
Security Pacific Corp	2.2826	1.1468	0.5465
Signet Banking Corp	2.1762	1.2030	0.2877
Sterling Bancorp	0	0	0
Southeast Banking Corp	1.1699	0.7788	0.4042
Southwest Florida Banks	0	-	-
Sun Banks	-	0.3154	-
Suntrust Banks	-	-	0.0564
Texas American Bancshares	-	0.0448	0.1152
Texas Commerce Bancshares	0.5523	0.3085	0.5050
United Jersey Banks	0	0	0
Union Commerce Corp	0	-	-
Wachovia Corp	0.2696	0.4577	0.1064
Wells Fargo	3.1705	4.0747	0.6596
Western Bancorp	1.4331	0.9020	0.6465
Worthen Banking Corp	-	-	0
Wyoming Bancorp	0	0	0

*Latin American exposure is defined as loans to Latin America divided by the market value of shareholders' equity.

Source: Annual Reports and 10-K Reports

Table 3.5

Descriptive Statistics of the Sample of U.S. Banks (1982)
(Mean Values)

Variable	High Exposure Group	Medium Exposure Group	All Exposed
Assets($ mil.)	47447.1	16401.1	26749.7
Equity($ mil.) (book value)	1786.8	795.6	1126.0
Equity($ mil.) (market value)	908.0	467.9	614.6
Primary Capital ($ mil.)	2157.9	820.5	1266.3
Primary Capital Ratio	4.6	6.0	5.6
Latin Loans ($ mil.)	3630.5	853.3	1799.0
LAMVAL# (%)	481.57	197.09	291.92
LATASET@ (%)	7.27	4.69	5.55
N	13	26	39

Source: Annual Reports and 10-K reports.

LAMVAL = Latin American loans outstanding divided by market value of equity.

@ LATASET = Latin American loans outstanding divided by total assets.

Table 3.6

Descriptive Statistics of the Sample of U.S. Banks (1986)
(Mean Values)

Variable	High Exposure Group	Medium Exposure Group	All Exposed
Assets($ mil.)	57471.7	23100.9	37831.3
Equity($ mil.) (book value)	2878.6	1226.9	1934.8
Equity($ mil.) (market value)	2405.4	1465.4	1857.0
Primary Capital ($ mil.)	4152.1	1658.3	2727.1
Primary Capital Ratio (%)	7.3	7.3	7.3
Latin Loans ($ mil.)	4115.9	621.3	2118.9
LAMVAL# (%)	202.90	39.57	109.57
LATASET@ (%)	6.73	2.45	4.29
N	15	21	36

Source: Annual Reports and 10-K reports.

LAMVAL = Latin American loans outstanding divided by the market value of equity.

@ LATASET = Latin American loans outstanding divided by total assets.

Table 3.7

Latin American Debt Held by the U.K. Banks

Bank	1983			1986		
	Amount (£ mil.)	% of Assets	% of Capital	Amount (£ mil.)	% of Assets	%of Cap.
Barclays Bank	1886	2.9	94.0	1870	2.9	61.1
Lloyds Bank	3122	7.1	152.1	2675	6.6	97.4
Midland Bank	2999	5.7	157.9	3298	5.7	178.6
Nat. Westminster Bank	1456	4.5	93.4	1153	1.6	38.8
Std. Chartered Bank	1180	3.4	89.3	895	2.5	69.1
Mean	2129	4.7	117.3	1978	3.9	89.0

Source: Annual Reports

Table 3.8

Latin American Debt Held by the Canadian Banks

Bank	1983 Amount (Cdn.$) (millions)	1983 % of Assets	1983 % of Capital	1986 Amount (Cdn.$) (millions)	1986 % of Assets	1986 %of Capital
Bank of Montreal	4540	7.7	220.6	5402	6.6	180.4
Bank of Nova Scotia	3087	5.6	180.7	3883	6.4	137.7
Can. Imp.Bk. of Commerce	3393	5.0	142.4	4090	4.9	116.5
National Bk. of Canada	1780	10.0	289.9	1848	6.6	135.0
Royal Bank of Canada	6439	8.4	201.3	6166	6.2	135.2
Toronto Dominion Bk.	2442	5.8	143.1	2670	5.2	86.4
Mean	3614	7.1	196.3	4010	6.0	131.9

Source: Annual Reports

CHAPTER 4

THEORY AND METHODOLOGY

Among the various hypotheses (discussed in Chapter 2) that attempted to explain the events related to the Latin American debt crisis, the new information hypothesis has made significant contributions to our understanding of the problem by its focus on the information content of specific events. The capital regulation hypothesis, proposed in this dissertation, analyzes the debt crisis from another crucial perspective, that is, capital regulation of the banking industry. This chapter elaborates on both of these theoretical perspectives and derives testable hypotheses. The proposed methodology to measure the event period excess returns and to test the hypotheses is also discussed. Another important issue addressed in this chapter is the potential shift in risk characteristics of bank stocks around the events.

This chapter consists of four sections. Section A contains a discussion of the two hypotheses proposed in the dissertation, the new information hypothesis and the capital regulation hypothesis. Section B describes the methodology to test the hypotheses. Section C discusses the analysis of the change in risk characteristics of bank stocks as a result of the events. The last section summarizes the chapter.

A. Theory

1. New Information Hypothesis

According to this hypothesis events related to the Latin American debt crisis impound new information about the quality of assets of the banks that are lenders to Latin American countries. In an efficient capital market, any information about bank loans should be reflected immediately and without bias in the stock prices of the banks exposed to Latin American debt. The event has information content if it makes investors reassess their valuation of the bank loans. For example, the announcement of a debt moratorium may adversely affect investors' beliefs about the probability that the Latin American loans may be repaid. Consequently, bank stock prices may decline immediately following the announcement of the moratorium.

If investors are rational, the size of response should be related to the degree of exposure of each bank to Latin America. In other words, investors should be able to discriminate among banks that are exposed to Latin America and those that are not. However, it should be noted that exposure levels of banks to individual countries were not publicly known prior to 1983. Thus, testing of relationship between excess returns and the Latin American exposure of each bank for the events before 1983 is, in fact, a test of the strong-form efficiency of the market. For events after the Mexican moratorium, the test is concerned with semi-strong form

efficiency.

Most of the studies on the Mexican moratorium event have considered the information content of the announcement of the moratorium, but none have analyzed the events from the perspective of bank capital regulation. Studies on other events related to the Latin American debt problem also failed to consider the capital regulation aspect in depth.

2. Capital Regulation Hypothesis

It is argued here that the interaction of bank capital adequacy regulation and bank examination procedures can induce the financial market to alter assessments of bank value in response to external events, even if the announcements contain little new information about the market value of relevant assets. The rationale behind this is that bank regulatory procedures and the application of capital adequacy standards influence levels of permissible leverage. Thus, publicly announced external events can induce regulators to enhance pressures on banks to increase capital. This increases the probability that banking firms will seek external equity financing.

Regulators are concerned about bank capital because capital provides a cushion to absorb losses. When a loan turns bad, a bank has to dip into its retained earnings and then its capital. From the regulators' point of view, as capital increases, the risk exposure of the deposit insurance

system decreases.[1] Shortage of capital curtails banks' freedom of action on issues such as mergers and acquisitions, dividend payments, branch expansion, and advertising expenditures . For example, Federal Reserve approval for Bank Holding Company acquisitions is linked to acceptable capital ratios. Capital regulation can force managers to take actions that would not be taken in the absence of regulation (for example, managers may be forced to go to the capital markets to raise equity in order to satisfy the requirement of minimum regulatory capital ratios).

The capital ratios for large, publicly traded banks declined over a long period during the 1960s and 1970s. Realizing the importance of capital adequacy and the secular decline in capital ratios of major banks, regulators strengthened capital requirements in 1981. In December 1981, minimum primary capital was set at 6% of assets for banks and bank holding companies with assets less than $1 billion and 5% for organizations with assets of $1 billion or more.[2] Primary capital is defined as shareholders' equity, perpetual preferred stock, reserves for loan and lease losses, some

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[1]Deposit insurance can be regarded as a put option on the assets of the bank at a striking price equal to the promised maturity value of the insured deposits (Merton 1977). The value of the option increases as the capital-to-assets ratio decreases or as asset risk increases since both factors increase default risk (Keeley 1989).

[2]Multinational bank holding companies were not formally brought into the purview of capital regulation in 1981, but they were to be judged individually.

mandatory convertible debt, minority interest in consolidated subsidiaries, and net worth certificates. Thus, regulation limits bank leverage by mandating that only certain types of debt qualify as primary capital. Capital regulation can force banks to change their capital structure if they are deficient of regulatory capital.

Regulatory assessments of bank capital (and thus permissible leverage) are directly influenced by examiner decisions about the asset quality of a bank's portfolio. Bank portfolios are generally dominated by non-marketable assets (loans) that impound considerable private information.[3] Under normal circumstances these assets are recorded at cost on bank accounting statements. Nevertheless, regulators irregularly but actively exercise their right to require banks to mark-to-market loans that are deemed to have fallen in quality. Thus, regulatory assessment of bank capital (and in turn permissible leverage) are directly influenced by examiner decisions about the asset quality of a bank's portfolio.[4] In particular the declaration that certain loans are to be regarded as non-performing or classified, reduces permissible leverage and

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[3]The asset services models of the banking firm indicate how banks have a comparative advantage at collecting private information about loan clients. An implication of these models is that bank assets are not easily valued in public securities markets. See Diamond (1984) and Ramakrishnan and Thakor (1984) for models of this type.

[4]Altman (1985) provides an analysis of the bank examination process and how regulators adjust bank book values to reflect perceptions about loan quality.

increases pressure on managers to raise new equity. In effect, regulators' judgments about loan quality reduce bank regulatory capital. In turn, this reduction in regulatory capital (and in permissible leverage) can induce banks to reduce leverage (such as by selling assets or canceling plans to acquire new assets) and thus forego some positive net present value projects or alternatively, to issue seasoned equity. Either action would result in a reduction in the market value of the banking firm. It should be noted that a public event such as the Mexican moratorium can increase the probability that a set of loans will be marked to market even if the event does not directly influence the financial market's assessment of the value of the loans in question. The rationale behind this is that the financial market must continuously estimate both the market value of the loans in question and the probability that the regulator will mark these loans to market and thus increase the pressure on bank managers to take actions to increase capital.

The objective of mark-to-market is that banks would exercise greater restraint in sovereign lending at an early stage.[5] In the absence of mark-to-market policy, banks can indefinitely postpone writeoffs of loans to countries experiencing payment problems. If these loans are periodically marked to market, investors evaluate the

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[5]See Gutentag and Herring (1985).

probability of default as the debtor countries become unstable. Hence, rate spreads will rise to reflect the increase in perceived risk of the loans. Consequently, banks are forced to writeoff the loans to reflect the market value. A mark-to-market policy would make it easier for bank creditors and shareholders to assess the impact of a bank's foreign loan portfolio on its value.

Bank examination procedures are designed to insure that bank capital and loan loss allowances reflect the regulator's assessment of the condition of the bank's loan portfolio. If bank examiners perceive a reduction in the probability that certain loans will be repaid in a timely fashion, those loans may be categorized as "classified". This classification requires that the banks increase loan loss reserves to cover the anticipated losses. Thus, it follows that, at irregular intervals bank examiners may order the adjustment of bank capital ratios to reflect accumulated changes in perceived loan quality. Such downward adjustments may alter the financial market's perception about the probability that a bank will enter the capital market to bolster its regulatory capital. This effect is aside from any impact of the market's assessment of the market value of the loans at issue.

Previous literature documents that seasoned equity issue announcements generate a significant reduction in share prices. Studies of seasoned common stock issues by nonfinancial firms report a negative effect of approximately

2.5% (Smith 1986). For bank seasoned stock issues, Polonchek, Slovin, and Sushka (1989) report a statistically significant negative share price effect of approximately -1.3%. Wansley and Dhillon (1989) examine the valuation effects of six types of securities issuance by BHCs during the period 1978-1985: common stock, preferred stock, convertible preferred stock, straight debt-- non-shelf and shelf-- and debt-for-equity swaps. They find statistically significant excess returns of -1.5% for common stock, significant positive returns of 0.8% for preferred stock and no significant excess returns for other securities. Wall and Peterson (1988) study the valuation effects of common stock, preferred stock, convertible debt, mandatory convertible debt, and subordinated debt issuance by BHCs during the period 1982-1986. They report a statistically significant excess return of -1.5% for common stock issuance, but no significant effects for other types of securities.

It is hypothesized that the financial markets interpret the announcement of the Mexican moratorium and other events in terms of increased probability that this debt would be categorized by regulators as nonperforming. As a result, the events should generate a more deleterious effect for commercial banks that were already poorly capitalized (in terms of regulatory capital) than for banks that were well-capitalized. Thus, according to the capital regulation hypothesis, the subset of banks with both exposure to Latin

American debt and an existing deficiency of regulatory capital would be under increased pressure to strengthen their capital. As a result, these events would be a precursor to either new equity issues or curtailments in bank leverage, actions that would have a negative impact on bank value.

It is worthwhile to note the regulators' response to the Mexican moratorium event. The three U.S. federal bank regulatory agencies--the Federal Deposit Insurance Corporation, the Federal Reserve, and the Comptroller of the Currency-- have explicitly recognized the "transfer" risk in sovereign lending.[6] Among various measures proposed, three are important: a) greater public disclosure of country exposure, b) definition of new loan classifications, and c) higher capital ratios and relating capital to country lending. These three measures are discussed in the following paragraphs.

a) Disclosure Requirements

Immediately following the Mexican moratorium announcement, bank regulators and the Securities and Exchange Commission made it mandatory for banks to disclose to the

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[6]Country risk is defined as the risk that a debtor country fails to accumulate enough foreign exchange to meet debt-service obligations on loans denominated in foreign currency. Country risk is divided into two categories: sovereign risk and transfer risk. Sovereign risk arises when a sovereign borrower reneges on its external obligations and no legal redress may be available. When a private-sector borrower is unable to obtain foreign exchange to service his foreign debt, the risk is classified as transfer risk. See Friedman (1983) for a full discussion.

public information on foreign loan exposure. Banks are required to report individual country exposures that exceed 0.75% of total assets or 15% of primary capital, whichever is less. The purpose of public disclosure is that it would enable financial markets to discipline banks incurring excessive risks.

b) Reserve and Loan Classification

In September 1983, the three federal bank agencies adopted a new classification system for loans affected by transfer risk. The three categories are: substandard, value impaired, and loss.[7] Loans classified as "loss" are deducted from capital.

During February 1984 the regulators implemented a provision of the International Lending Supervision Act (1983) that requires banks to establish a special Allocated Transfer Risk Reserve (ATRR) against certain categories of international loans. The ATRR is charged against current income and is not considered as part of capital and surplus or allowances for possible loan losses for regulatory, supervisory, or disclosure purposes. The ATRR is applicable for value-impaired loans.

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[7]For a full discussion of these categories, see Joint Press Release, Comptroller of the Currency, Federal Deposit Insurance Corporation, and Federal Reserve Board, "Interagency Statement on Examination Treatment of International Loans," December 15, 1983.

c) Capital Adequacy

The most important response of bank regulators to the debt crisis has been to extend and enhance the minimum capital ratios for all banks. In June 1983, the Federal Reserve Board issued guidelines requiring multinational banks to maintain primary capital equal to 5% or more of total assets. It may be noted that the multinational BHCs are highly exposed to Latin America and are operating at capital ratios of about 4%. The joint memorandum of the three federal agencies proposed that the regulators should "highlight certain large concentrations of credit" and factor these "into the evaluation of a bank's capital adequacy".[8] In other words, banks with high exposure to a particular country are expected to maintain higher capital ratios than those with more diversified portfolios.

The International Lending Supervision Act of 1983 required the federal banking agencies to cause banking institutions to achieve and maintain adequate capital by establishing minimum levels of capital and other appropriate measures. It further provided that the agencies may issue directives to banking institutions with deficient capital ratios to submit and adhere to plans to achieve required levels of capital. In June 1985, the federal banking agencies

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[8]Joint memorandum, Conover, Issac, and Volcker, "Program for Improved Supervision of International Lending," April 7, 1983.

issued new capital adequacy standards under which bank holding companies and commercial banks are expected to maintain a minimum primary capital to total assets ratio of 5.5% and a minimum total capital to total assets ratio of 6%.[9] The regulations also provided that capital directives having the force of cease and desist orders may be issued to mandate the maintenance of adequate capital levels.

In 1988, the regulators from twelve leading industrial countries adopted a more stringent set of "risk-based" capital requirements to be implemented in stages.[10] These guidelines are designed to achieve more consistent capital measurements and standards to be applied to banks engaged in international business. Bank assets are divided into four risk classes and are assigned different weights on the basis of estimated counterparty risk. Capital is classified as core ("Tier I") or supplementary ("Tier II"). Tier I capital is basically common shareholders' equity. Tier II capital includes subordinated debt and most preferred shares. For the first time, off-balance sheet items are brought into the purview of capital regulation.[11]

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[9]Total capital is defined as the sum of primary capital and secondary capital, where secondary capital includes limited life preferred stock, subordinated notes and debentures.

[10]These countries include U.S.A., U.K., and Canada.

[11]Under these guidelines, off-balance sheet commitments are converted to equivalent balance sheet risks for determining total risk-weighted assets. A credit conversion factor of zero to 100 per cent is applied to the principal

It is clear from the above discussion that the thrust of regulation after the Mexican moratorium is to strengthen and enforce capital standards on all banks and to factor the country risk into bank capital. As a result, the capital ratios of banks have improved considerably since 1982. For example, the average primary capital ratio for the 15 largest BHCs increased from 4.6% in 1982 to 6.27% at the end of 1984 and to 7.3% in 1986. The nine largest banks raised a primary capital of $5.3 billion between the end of 1982 and September 1984 (Bergsten, Cline, and Williamson 1985). As shown in Table 4.1 there are 69 security issuances between 1982 and 1986 compared to 38 between 1975 and 1981.[12]

In summary, two hypotheses are proposed in this section. The new information hypothesis involves three propositions. The first one is whether the event has information content affecting all banks in general. The second proposition is whether the market differentiated banks with Latin American loans from those which do not have such loans. The third proposition relates to market discrimination of banks within the exposed group according to the level of exposure of each

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amount of credit instruments to arrive at a balance sheet equivalent amount. This is further discounted using the balance sheet risk factor applicable to the counterparty. For example, interest rate and exchange futures are estimated by applying a prescribed risk factor to the notional principal amount of individual contracts outstanding.

[12]The sample consists of securities issued by Bank Holding Companies (BHCs) and the data are from Irving Trust's *Capital Securities Issued: Commercial Banking*. See Keeley (1989).

bank to Latin America. The capital regulation hypothesis tests whether the market could distinguish banks according to capital adequacy. The two hypotheses are not mutually exclusive. An event can have information content about the quality of bank assets having Latin American loans. The event can also induce the financial market to alter assessments as to whether regulators will exercise their authority to require banks to mark to market loans that have sustained reduction in quality. Thus, the market can distinguish banks according to exposure levels or capital adequacy or both.

B. Methodology

The hypotheses testing proceeds in two stages. In the first stage, excess returns during event period are estimated using event study method. Two estimation techniques, the Ordinary Least Squares (OLS) method and the Generalized Autoregressive Conditional Heteroscedasticity (GARCH) method, are employed. If the excess returns for any event are not statistically significant on the event day, it is inferred that the event has no information content. And no further analysis for that event is performed.[13] If the excess returns are significant, then the second stage of analysis is

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[13]Even though the average excess return is not significantly different from zero, the individual excess returns could still be significant and may provide information. Hence, in this study hypotheses testing is performed if a majority of event-day individual excess returns are statistically significant for any event.

undertaken. In this stage, a set of regressions between excess returns and other relevant variables (e.g., Latin American exposure, primary capital ratio) is estimated to test the two hypotheses. The remainder of this section discusses the event study method, the GARCH model as a technique to overcome some shortcomings in the OLS market model, and the regression models to test the two hypotheses proposed in Section A.

1. Event Study Method

Like most other studies on the Latin American debt crisis (except Cornell and Shapiro 1986) this dissertation employs event study method to analyze the events identified in Chapter 3. The basic method for event studies is described in Fama et al. (1969). Since then event studies have become an important tool of empirical research in finance. Event studies examine the impact of specific events on the price/return of the firms affected by the event.

The objective of an event study is to see whether there are any excess returns for the stocks affected by the event in the period surrounding the event. The excess return is the difference between observed return and the return generated by an appropriate model. There are three methods currently in use for measuring excess returns: the mean adjusted returns method, the market adjusted returns method, and the Ordinary Least Squares (OLS) market model.

Brown and Warner (1985) report that when event dates are

clustered, market-adjusted methods are better than non-market adjusted methods. In this study, the entire sample has only one event date for each event, a case of perfect clustering. Also, keeping in view the wide usage of the OLS market model in the literature, this dissertation employs OLS market model, a discussion of which follows next.

2. OLS Market Model

The excess return in OLS market model is specified as

$$\epsilon_{it} = R_{it} - \hat{a}_i - \hat{b}_i R_{mt}$$

$$\epsilon_{it} \sim N(0, \sigma^2_i),$$

where R_{it} is the observed return for security i on day t, R_{mt} is the return on market index on day t, and ϵ_{it} is the corresponding excess return. For each firm, the coefficients, a_i and b_i, are estimated over a 250-day pre-event interval ($t = -260$ to $t = -11$).[14] The average excess return for day t, AR_t, is obtained by averaging the excess returns over all securities:

$$AR_t = (1/n) \sum_{i=1}^{n} \epsilon_{it},$$

[14]The choice of estimation period is arbitrary and is left to the discretion of the researcher. Typical lengths of estimation period range from 100 to 300 days. A longer estimation period results in improved prediction model, but the cost is model parameter instability.

where n is the number of events. The null hypothesis is that the average excess return is equal to zero for each event sub-period. The test statistic for any day is the ratio of average excess return to its estimated standard deviation:

$$\text{t-stat} = AR_t \; / \; \hat{SD}(AR_t) \sim t(T-1),$$

where

$$\hat{SD}(AR_t) = \left[\sum_{t=1}^{T} (AR_t - \overline{AR})^2/(T-1) \right]^{1/2},$$

is the standard deviation of a time series of average excess returns over the estimation period, and

$$\overline{AR} = (1/T) \sum_{t=1}^{T} AR_t,$$

is the average excess return over the estimation period. If AR_t is a stationary, normal process, the test statistic is distributed as a Student-t under the null hypothesis.

To examine the cumulative effect of a particular event over time, the Cumulative Average Excess Return (CAR) approach is used. The CAR from day k to m is defined as

$$CAR_{k,m} = (1/n) \sum_{t=k}^{m} \epsilon_{it},$$

The cumulation is performed over various intervals depending on the nature of the problem. The test statistic is the ratio of mean cumulative excess return to its estimated standard deviation:

$$MCAR_{k,m} \; / \; \hat{SD}(MCAR_{k,m})$$

If the ARs or CARs are statistically significant, then it is inferred that the event has information content affecting the security returns. If the CARs do not return to zero within a reasonable period after the event, the event is said to have a permanent effect on stock prices.

The OLS market model suffers from some drawbacks which are discussed below.

Nonnormalities and nonlinearities:

In testing the statistical significance of the average excess returns (ARs) during the event period, the ARs are assumed to be independent, identically distributed, and normal. The test-statistic is distributed as Student-t under the null hypothesis that the AR on day t is zero. However, empirical studies (e.g., Brown and Warner 1985) show that the daily excess returns from the market model, like daily returns, for an individual security are fat-tailed (leptokurtic) and nonnormal. Nonnormality of the error distribution may result in higher probability of Type-I error (Seber 1977, Brown and Forsythe 1974, Layard 1973, and

Giaccotto and Ali 1982). Thus, the test of significance may be misspecified. A large sample size may diminish the problem of nonnormality.

The market model residuals also exhibit significant departures from a linear model (e.g., Lee 1976 a,b; McDonald 1983). The possible sources for these nonlinearities are: i) nonnormalities, ii) heteroscedasticity in the error variance, and iii) a nonlinear relationship between the variables. McDonald and Lee (1988), using generalized functional form of the market model, conclude that these nonlinearities are due to nonnormalities and unequal variance.

Heteroscedasticity:

A number of studies (e.g., Bey and Pinches 1980, Giaccotto and Ali 1982, Brown 1977, and McDonald and Morris 1983) document the presence of heteroscedasticity in the market model. Bey and Pinches (1980) provide a review of various studies on heteroscedasticity. Heteroscedasticity is also detected in the Canadian and the European markets (e.g., Barone-Adesi and Talwar 1983, and Belkaoui 1977).

The existence of heteroscedasticity in the market model affects the event studies in two ways. First, it results in inefficient parameter estimates and second, it causes biased test statistics.

The market model in matrix notation can be written as,

$$Y = X\beta + \epsilon$$

The variance-covariance matrix of the OLS estimator $(\hat{\beta})$ is:

$$\Omega_1(\hat{\beta}) = \sigma'^2 (X'X)^{-1},$$

where $\hat{\sigma}^2 = \hat{\epsilon}' \hat{\epsilon}/(T - k)$, T is the sample size and k = 2.

In the presence of heteroscedasticity, a consistent estimator of the variance-covariance matrix is:

$$\Omega_2(\hat{\beta}) = (X'X)^{-1}(X'\hat{\Sigma}X)(X'X)^{-1},$$

where $\hat{\Sigma} = \mathrm{diag}(\hat{\epsilon}_1^2, \ldots, \hat{\epsilon}_T^2)$.

The two estimators, Ω_1 and Ω_2, will converge to different limits.

Thus, $\Omega_1(\hat{\beta})$ is inconsistent if heteroscedasticity is present. The variance of β will be overstated, which implies less frequent rejection of the null hypothesis that $\beta = 0$. A second consequence of heteroscedasticity is that estimator of the variance of β is biased. The nature of the bias depends on the assumed form of the heteroscedasticity. Another result is that the use of OLS to estimate a heteroscedastic process could bias the R^2 in a positive direction (Kmenta, 1971, pp. 259-261). It means that the level of systematic risk associated with securities will be overstated.

Variance Increase in Event Studies

The importance of changing variance in event studies is well recognized in the literature. Studies by Beaver (1968), Patell and Wolfson (1979), Kalay and Lowenstein (1983), Christie (1983), Ohlson and Penman (1985), and Billingsley and Lamy (1988) document significant increases in variance around some events. In testing the statistical significance of "events" it is imperative that a correct estimate of the standard errors of the excess returns should be obtained. Since the OLS model assumes homoscedasticity, the increase in variance will result in misspecification of hypothesis tests for testing the significance of excess returns during the event period.

Although the problem of changing variance in event studies is well recognized, the approach to correct it is rather *ad hoc*. Two important methods suggested to deal with increase in variance are the cross-sectional procedures and sample partitioning. In cross-sectional procedures (e.g., Penman 1982, and Mikkelson 1981), the variance of the mean excess returns is estimated each day during the event period by the cross-sectional variance. Brown and Warner (1985, Table 9) show that statistical tests using cross-sectional variance are well-specified even when there is a significant increase in variance during the event period. However, the tests are misspecified if the variance shift differs across sample securities. Moreover, cross-sectional procedures

ignore pre-event period information resulting in less powerful tests. Ball and Brown (1968) suggest partitioning of the sample based on an economic model of the effects of the event to address the issue of variance increase. This procedure can reduce the degree of misspecification in time-series procedures.

Karpoff (1987) argues that the rate of information flow around "event" periods will be higher than that during the non-event period. Hence, the variance of the "true" price process will be higher around the event date, implying that the OLS model, which assumes constant variance, is misspecified. By assuming constant variance, the information arriving around the event period is not incorporated in the price process. Hence, Karpoff suggests that the sample variance around the event period should be adjusted for the increased rate of information flow so that the statistical tests of excess returns are more accurate and well-specified.

Thus, the problem of variance increase and the need for using the appropriate variance estimator in event studies are well recognized. To quote Brown and Warner (1985), "while nonnormality and biases in estimating the market model are unimportant in tests for abnormal performance, the choice of variance estimator to be used in hypothesis tests is of some concern, affecting both the specification and power of the tests...further research is necessary to fully understand the properties of alternative procedures for measuring abnormal

performance in such situations (p26,27)". Since the current treatment of the problem of changing variance is rather *ad hoc* in the literature, this study undertakes a systematic approach based on the GARCH model.

Cornell and Shapiro's criticism

Cornell and Shapiro (1986) raise an important issue regarding the appropriateness of the event study method in the analysis of the Latin American debt crisis. They argue that

> "classical event studies typically assume that information arrives in a form akin to discrete 'quanta' and that the day of arrival of new information can be identified. This makes powerful tests possible since the variance of the rate of return is approximately a linear function of the observation interval. Over short intervals, therefore, the variance of stock returns is quite low assuring a high signal-to-noise ratio and allowing the impact of an event to be isolated fairly easily" (p 58).

They propose the 'dribs and drabs' hypothesis, meaning that information about Latin America reached the market continuously throughout 1982. When information leaks continuously it is incorporated into the stock prices before the event. Thus, the information arriving on a particular date (e.g., the Mexican moratorium announcement day) may not be significant. They argue that since the event date cannot be pinpointed exactly the event study method cannot be used in the case of Latin American debt crisis. Since the OLS model calculates only unconditional moments, the information leaking

prior to the event is not taken into account.

One approach to rectifying deficiencies in OLS market model is to use the Generalized Autoregressive Conditional Heteroscedasticity (GARCH) model. The GARCH model also seeks to address the criticism of Cornell and Shapiro since it calculates the conditional variance for each day, incorporating prior information. A discussion of the GARCH model follows.

3. GARCH Model

The standard approach to heteroscedasticity is to introduce an exogenous variable which is a function of variance. For example, in the studies on heteroscedasticity in the market model, the variance of the residuals is assumed to be a function of the return on the market index. The following functional form is specified (e.g., McDonald and Morris 1983, McDonald and Lee 1988):

$$\sigma^2 = a + bR_{mt} + cR_{mt}^2$$

This conventional solution to the problem of heteroscedasticity seems unsatisfactory since it is often difficult to recognize the exogenous variables that affect the variance. The selection of the variables is rather *ad hoc*.

Engle (1982) proposed a class of models called Autoregressive Conditional Heteroscedastic (ARCH) models to

deal with the problem of heteroscedasticity in time series data and pioneered a rich stream of literature in recent years.[15] These models recognize that both conditional mean and variance jointly evolve over time. Heteroscedasticity is parameterized as a simple linear process facilitating easy statistical estimation.

Consider a process

$$y_t = x_t b + \epsilon_t,$$

where x_t is a known vector, b is a vector of unknown parameters and ϵ_t is the white noise. The conditional mean given the past information set, ψ_{t-1}, is bx_t and unconditional variance is σ^2. If the process follows a conditional normal distribution, then the ARCH regression model is specified as:

$$y_t | \psi_{t-1} \sim N(x_t b, h_t)$$

$$h_t = \omega + \sum_{i=1}^{p} \alpha_i \epsilon^2_{t-i}$$

For the ARCH process to satisfy the regularity conditions, it is assumed that $\omega > 0$, and $\alpha_1, \alpha_2, \ldots, \alpha_p \geq 0$. p is called the order of the ARCH process. If $p = 0$, the process is Gaussian white noise. If the sum of the α_i's exceed one the process will have an infinite unconditional variance.

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[15]For a review of ARCH modeling in finance, see Bollerslev *et al.* (1990).

Engle (1982) established that the information matrix is block diagonal, which implies that the maximum likelihood estimators of α and b are independent. Thus, α and b can be estimated separately without asymptotic loss of efficiency. Engle also established that the maximum likelihood estimators of α and b are asymptotically normal if the conditions of Crowder (1976) are satisfied. The log likelihood function for a sample of size T is the sum of the conditional log likelihoods:

$$L_T = 1/T \sum_{t=1}^{T} l_t,$$

$$l_t = -\tfrac{1}{2}\ln(h_t) - \tfrac{1}{2}\epsilon^2{}_t h_t^{-1} - \tfrac{1}{2}\ln(2\Pi),$$

where l_t is the log likelihood of the t th observation. Engle suggests use of scoring method to obtain the maximum likelihood estimates since it requires only the first derivatives of the likelihood function. The Lagrange Multiplier test is used to test for the presence of the ARCH process.

The ARCH process generates fatter tails for the conditional distribution than the normal. This property is useful in explaining the speculative price behavior. It has long been established that the daily stock returns data exhibit fatter tails than the normal distribution (e.g., Fama 1965). Empirical research showed that the daily excess

returns from the market model, like daily returns, for an individual security are leptokurtic (e.g., Brown and Warner 1985). The stock return distribution also exhibits persistence of volatility (e.g., Mandelbrot 1963, and Fama 1965). Mandelbrot notes that large price changes are followed by large changes of unpredictable sign. These two properties (leptokurtosis and persistence of volatility) can be modeled by the ARCH process. Since the conditional variance is a function of the past squared errors in the ARCH model, large values of variance are followed by large values of either sign. Thus, the ARCH process reflects available information not only in the first moment but also in the second moment.

In empirical applications of the ARCH model it has been found that a high order p is required to fit to the data. Moreover, to avoid the problem of negative variance parameter estimates a fixed lag structure is imposed. Hence, Bollerslev (1986) generalizes the ARCH model as Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model which has a longer memory and a more flexible lag structure. The GARCH model allows the conditional variance to be a simple linear function of the past errors and the past conditional variances. Hence, GARCH model represents some sort of adaptive learning mechanism based on the past variances. The GARCH(p,q) regression model is specified as:

$$y_t = bx_t + \epsilon_t,$$

$$y_t | \psi_{t-1} \sim F(\mu_t, h_t),$$

$$\mu_t = bx_t,$$

$$h_t = \omega + \sum_{i=1}^{p} \alpha_i \epsilon^2_{t-i} + \sum_{j=1}^{q} \beta_j h_{t-j},$$

where

$p > 0$ and $q \geq 0$,

$\omega > 0$, $\alpha_i \geq 0$, $i = 1,....,p$

$\beta_j \geq 0$, $j = 1,....,q$

The non-negativity condition for the parameters ensures a well defined process. When $q = 0$, the ARCH(p) model results and when $p = q = 0$, the process is Gaussian white noise. $F(\mu_t,h_t)$ is the conditional distribution of y_t, conditional on the information set, ψ_{t-1}.

Bollerslev (1986) shows that the GARCH(p,q) process can be approximated by a stationary ARCH(p) process for a sufficiently large value of p. Thus, GARCH is a parsimonious model compared to the ARCH model. Stationarity conditions require that the sum of α_i's and β_j's is less than one. GARCH process, like the ARCH process, is leptokurtic. If α or β is positive , then shocks to volatility persist over time. Since the conditional variance depends on the available information

set, it is affected by large shocks (positive or negative) in y_t. The conditional variance is large when the past errors ($\epsilon^2_{t-1}, \epsilon^2_{t-2}, \ldots$) and past realized variances ($h_{t-1}, h_{t-2}, \ldots$) are large. This property is useful in event studies since the variance is found to increase substantially around the event date and may persist for some time.

Bollerslev shows that the autocorrelations and partial autocorrelations for ϵ^2_t can be used in preliminary identification and checking of the GARCH model in the variance equation. As in the case of the ARCH process, the information matrix for the GARCH model is also block diagonal. Thus, the parameters of the GARCH model can be estimated independently without loss of asymptotic efficiency. For estimating the GARCH model the method of scoring will be very complicated, due to the presence of the recursive part in the derivatives of the variance function, h_t. Hence, Bollerslev recommends the use of the BHHH (Berndt, Hall, Hall, and Hausman 1974) algorithm for maximum likelihood estimation of the GARCH model.

Bollerslev (1987) shows that GARCH(1,1) model is a parsimonious representation of many economic time series. It may so happen that several ARCH(p) and GARCH(p,q) processes may be nested within a higher order GARCH model. Likelihood ratio tests may be used to select the appropriate model. Let

$$\theta = (\omega, \alpha_1, \ldots\ldots, \alpha_p, \beta_1, \ldots\ldots, \beta_q)$$

represent the set of parameters of the GARCH(p,q) model. The log-likelihood function is

$$L(\theta|p,q) = \sum_{t=\max(p,q)}^{T} \log f(\mu_t, h_t),$$

where $f(\mu_t, h_t)$ is the density function. The likelihood function is maximized for several values of p and q. If $L(\theta_0)$ and $L(\theta_a)$ are the maximum log-likelihood function values for the null and alternative hypotheses, then the likelihood ratio,

$$LR = -2\{L(\theta_0) - L(\theta_a)\},$$

is asymptotically chi-square distributed with the number of degrees of freedom equal to the difference in the number of parameters under the two hypotheses (Akgiray 1989, p.68).

To estimate the GARCH model, the distribution function, $F(\mu_t, h_t)$ must be specified. Most of the studies assumed conditional normal distribution for the error terms (e.g., Engle 1982, Bollerslev 1986, Akgiray 1989, and Akgiray, Booth and Loistl 1989). Bollerslev (1987) introduces a conditionally t-distribution assumption in the GARCH model to

explain the behavior of speculative price changes.[16] The unconditional kurtosis in the stock return data can be explained either by conditional heteroscedasticity or by a conditional leptokurtic distribution. The t-distribution assumption allows to distinguish between the two. Bollerslev argues that GARCH model with the conditional normal errors, although leptokurtic, may not explain the observed leptokurtosis in the stock return data. The t-distribution is better in explaining the leptokurtosis because an unobservable error term is added to the conditional variance equation.

Suppose the conditional distribution of y_t is standardized t with mean $y_{t|t-1}$, and variance $h_{t|t-1}$.

$$y_t = E(y_t | \psi_{t-1}) + \epsilon_t = y_{t|t-1} + \epsilon_t,$$

$$\epsilon_t | \psi_{t-1} \sim f_\nu(\epsilon_t | \psi_{t-1}),$$

where ν is the degrees of freedom and $f_\nu(\epsilon_t | \psi_{t-1})$ is the density function of ϵ_t, conditional on the information set, ψ_{t-1}. The conditional variance h_t can be written as

$$h_t = E(h_t | \psi_{t-1}) + e_t = h_{t|t-1} + e_t,$$

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[16]Nelson (1989) extends the GARCH model with a conditional density based on the Generalized Error Distribution or the power-exponential distribution as defined by Box and Tiao (1973). Booth *et al.* (1990) report that the power exponential distribution fits better than the Student-t distribution for Finnish stocks.

where e_t denotes the prediction error in the conditional variance. For large values of ν the t-distribution approaches the normal distribution. However, for small values of ν, the t-distribution has fatter tails than the normal distribution.

The problem of changing variance in event studies and the importance of ARCH models in providing a systematic approach to the problem have been recognized in a few event studies incorporating the ARCH model.[17] For example, Bera, Bubnys, and Park (1988), using monthly returns of individual firms on CRSP tape for 1976-1983, report that conditional heteroscedasticity is more widespread than unconditional heteroscedasticity in the market model. They employ the ARCH(1) model to estimate the beta and find a marked improvement in the efficiency of the market model coefficients across all firms in the sample. Connolly (1989) employs the GARCH(1,1) model to study the weekend effect on three different indices. He reports weaker weekend effects for some sub-sample periods when adjustment for the temporal variation in conditional variance is applied. Poon (1988) uses the GARCH(1,1) model to investigate the stock split event. In this model, the conditional variance is governed by the daily trading volume instead of the past sampling variance.

The GARCH(p,q) model as applied to the market model is

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[17]For a review of ARCH models in event studies, see Bollerslev *et al*. (1990).

given by:

$$R_t = a + bR_{mt} + e_t,$$

$$e_t | \psi_{t-1} \sim f(\mu_t, h_t),$$

$$\mu_t = a + bR_{mt},$$

$$Var(e_t | \psi_{t-1}) = h_t = \omega + \sum_{i=1}^{p} \alpha_i e_{t-i}^2 + \sum_{j=1}^{q} \beta_j h_{t-j},$$

where f is the conditional distribution, μ_t is the conditional mean, and h_t is the conditional variance, depending on the available information set, ψ_{t-1}. Maximum likelihood estimates are obtained by the BHHH algorithm using numerical derivatives. The model is estimated for several combinations of p and q assuming both the conditional normal and Student-t distributions. Likelihood ratio test is used to select the best combination of p and q. However, this test only shows whether t-distribution is better than normal distribution or not. Hence, goodness-of-fit tests may be employed to check whether t-distribution fits to the data.[18]

The Pearson goodness-of-fit test statistic is defined as:

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[18]See Hsieh (1989) for a comprehensive set of diagnostic checks.

$$Q_{k-1} = \sum_{i=1}^{k} (A_{it} - nP_{io})^2/nP_{io},$$

where k is the number of mutually exclusive cells in which the data are subdivided, P_{io} is the probability of an observation occurring in that cell, n is the number of observations, and A_{it} is the standardized residuals for stock i on day t calculated as:

$$A_{it} = e_{it} / \sqrt{h_{it}}$$

Kendall and Stuart (1979) suggest that the class boundaries can be determined using an equal probabilities method, where P_{io} is equal to 1/k. The number of classes is calculated using the following formula:

$$k = b\{2^{1/2}(n-1)/(\lambda_\alpha + G^{-1}[P_o])\}^{2/5},$$

where b is between 2 and 4, n is the sample size, α is the size of the test, λ_α is the corresponding statistic from the normal or Gaussian probability tables, P_o is the approximate power function for the maximization , and G^{-1} is the inverse of the normal or Gaussian probability distribution (Kendall and Stuart 1979, p.463). The statistic is distributed as $\chi^2_{(k-1-m)}$, where m is the number of estimated parameters.

Using e_{t-11} and h_{t-11}, the values of e_t and h_t for each day during the period day -10 to day +10 are calculated for each stock. The test-statistic for a sample of n stocks is

$$AR_t = \sum_{i=1}^{n} A_{it}/\sqrt{n} \sim N(0,1)$$

AR_t is distributed as standard normal under the null hypothesis that the mean excess return on day t is zero.

In summary, the event study method incorporating the GARCH model employed in this study has the following advantages:

a) The heteroscedasticity in the market model, which is widely documented in the literature, is modeled as a simple linear process in GARCH affording easy statistical estimation.

b) The issue of variance increase in event studies is addressed by using a combination of time-series and cross-sectional procedures. The variance for each day during the event period is estimated using the pre-event conditional variance. Thus, the estimation period data is not ignored, unlike in the usual cross-sectional procedures.

c) The benefit of sample partitioning in reducing misspecification (e.g., Brown and Warner 1985) in time-series estimation procedures is obtained in this study by dividing the sample of banks into three categories: high exposure banks, medium exposure banks, and zero exposure banks. It is

hypothesized, a priori, that the effect of any event differs according to the degree of exposure of each subsample.

d) The GARCH model meets the criticism of Cornell and Shapiro against using the event study method. The model addresses the problem of leakage of information prior to the event by calculating the conditional first and second moments (conditional on previous information) for each day. Thus, all information prior to the event is incorporated in the statistical tests of significance.

C. Testing of Hypotheses

If the excess returns on the event day obtained from the OLS market model or the GARCH model are statistically significant, then a series of regressions are performed to test the two hypotheses: the new information hypothesis and the capital regulation hypothesis. A discussion of the regression models follows.

1. New Information Hypothesis

The new information hypothesis is tested in two stages. The first test concerns whether the information arriving during the event period is reflected in the stock prices of banks with Latin American loans. To test whether the market could distinguish between exposed and nonexposed banks, the daily cross-sectional excess returns (ϵ_{it}) estimated from the

market model are regressed against a dummy variable for Latin American exposure:

$$\epsilon_{it} = a + b\ DUMEXP_i + u_{it}, \qquad (t = -1,0),$$

where the dummy variable takes on the value of unity for exposed banks and zero for nonexposed banks.

In the second stage, the exposed group is analyzed to test whether the event conveys information about the quality of Latin American loans. The cross sectional excess returns are regressed on a continuous variable for exposure (Mexican/Brazilian/Latin American) of each bank among the group of exposed banks. The regression equation is:

$$\epsilon_{it} = b_1 + b_2\ EXP_i + u_{it}, \qquad (t = -1,0),$$

where

ϵ_{it} = the excess return for bank i on day t,

EXP_i = the exposure of bank i , where exposure is defined as the loans (Mexican/Brazilian/Latin American) divided by the market value of equity, and

u_{it} = idiosyncratic error term.

If the coefficient b_2 is statistically significant, it indicates that exposure has an effect on event day excess returns.

Capital Regulation Hypothesis

Two regressions are estimated to test the capital regulation hypothesis.[19]

1) The set of exposed banks are disaggregated into subsamples of capital sufficient banks and capital insufficient banks.[20] The significance of the difference in excess returns between the two groups is tested by regressing the full set of announcement returns for exposed banks on a zero one dummy variable for capital sufficiency:

$$\epsilon_{it} = b_1 + b_2 \text{ DUMCAP}_i + u_{it}, \qquad (t = -1,0),$$

where DUMCAP is a dummy variable for capital sufficiency.

DUMCAP = 1 if the primary capital ratio of bank i is less than the required minimum ratio.

= 0 otherwise.

If the coefficient b_2 is negative and significant it

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[19]Musumeci and Sinkey (1990a) perform capital adequacy tests in case of Brazilian moratorium announcement. However, they do not develop the idea further and establish any link between capital inadequacy and regulators' reaction. They use capital adequacy as a common measure of "safety and soundness" (that is financial strength). Moreover, in the regression on capital adequacy tests, they use equity to total assets ratio rather than primary capital ratio which is a measure of adequacy of regulatory capital. Capital adequacy in this study refers to conformance with the regulatory requirement of minimum primary capital ratio.

[20]Capital sufficiency is defined with respect to the ratio of primary capital to total assets in comparison to the applicable regulatory minimum.

indicates that investors could differentiate between capital sufficient and capital deficient banks among the exposed group.

2) The excess returns are regressed against the primary capital ratio of each bank.

$$\epsilon_{it} = b_1 + b_2 \, PCAP_i + u_{it}, \qquad (t = -1,0),$$

where $PCAP_i$ is the primary capital ratio of bank i. The expected sign of b_2 is positive.

D. Shift in Risk Characteristics

It is interesting to observe how the risk characteristics of bank stocks changed in response to different events of the Latin American problem. Among the empirical studies on the Latin American debt problem, only Billingsley and Lamy (1988) analyze both the return and risk characteristics of stocks around the enacting of International Lending Supervision Act and find that the total riskiness of the sample increased.

The systematic risk is also found to change in some event studies. Thus, Kalay and Lowenstein (1986) report that the systematic risk of a sample of stocks increased on the two days around a dividend announcement. Brennan and Copeland (1988) find a permanent increase in the beta coefficient following stock splits.

The total risk of a portfolio of stock returns, R_p, is calculated as:

$$Var(R_p) = \beta^2_p \; Var(R_m) + Var(\epsilon_p),$$

where Var is the variance function, R_m is the return on the market portfolio, and ϵ_p is the average residual variance of the portfolio of stocks. To test whether the total risk has changed after the event, the null hypothesis is:

$$H_0: \sigma^2_B = \sigma^2_A,$$

where σ^2_B and σ^2_A are the variance of the portfolio before and after the event. The test statistic is given by the ratio of the sample variances before and after the event:

$$s^2_B \;/\; s^2_A,$$

The decision rule is:

If $F(\alpha/2;\; n_B-1,\; n_A-1) \leq s^2_B/s^2_A \leq F(1-\alpha/2;\; n_B-1,\; n_A-1)$,

conclude H_0. Otherwise, conclude H_a. Here n_B and n_A are sample sizes before and after the event.

To test for the change in portfolio beta after the event, the test statistic is:

$$t = (\beta_B - \beta_A)/\sqrt{s^2(1/n_B + 1/n_A)},$$

where s^2 is the pooled variance

$$s^2 = \{(n_B-1)s^2_B + (n_A-1)s^2_A\} / (n_B+n_A-2),$$

and β_B and β_A are the beta coefficients of the portfolio of stocks before and after the event. The test statistic is distributed as Student-t under the null hypothesis that the betas are equal.

E. Chapter Summary

This chapter proposes two testable hypotheses, the new information hypothesis and the capital regulation hypothesis, to interpret the significance of the events related to the Latin American debt crisis. Event study method is employed to estimate excess returns during the event period. The OLS market model, which is widely used in event studies to measure excess returns, suffers from some drawbacks like nonnormality, nonlinearities, and heteroscedasticity. The problem of changing variance during the event period is well recognized in the literature, but the approach to deal with it is rather *ad hoc*. These deficiencies affect the estimates of the market model parameters and the statistical tests of significance for event period excess returns. Cornell and Shapiro point out that the standard event study method is not suitable for the

Latin American debt problem since it cannot handle the leakage of information prior to the event. This study attempts to address these methodological issues by employing the GARCH model which incorporates prior information by calculating the conditional moments. A series of regression models are proposed to test the two hypotheses. Finally, tests for changes in the risk characteristics of the stocks as a result of the events are considered.

Table 4.1

Distribution of Security Issuance by U.S. BHCs (1982-1986)

Security	1982	1983	1984	1985	1986	Total
Common Stock	2	4	4	3	2	15
Preferred Stock	8	12	3	3	1	27
Convertible Debt				1	1	2
Mandatory Convertible Debt	3		12	6	1	22
Multiple Issue	2		1			3
Total	15	16	20	13	5	69

Source: Keeley (1989)

CHAPTER 5

MEASURING EXCESS RETURNS

The purpose of this chapter is to measure the excess returns of the sample of U.S. bank stocks for each of the events identified for analysis in Chapter 3. The first step in measuring excess returns during the event period is to establish the distributional properties of the residuals of the market model. The first section of this chapter discusses the distributional properties of the error terms of the market model using the Ordinary Least Squares (OLS) and the Generalized Autoregressive Conditional Heteroscedasticity (GARCH) estimation methods. Section B contains a description of the event study results for each event. The last section concludes the chapter.

A. Distributional Properties of the Market Model Residuals

The market model is estimated for each stock over a period of 250 days (t = -260 to t = -11) for the Mexican moratorium event using the OLS estimation method. The distributional properties of the OLS market model residuals are shown in Table 5.1. The table reports the Kolmogorov-Smirnov D-statistic for testing normality, mean, variance, skewness, kurtosis, and Durbin-Watson statistics. The market model parameter estimates are also reported. The p-values are shown

in parentheses.

The Kolmogorov-Smirnov test rejects normality in 39 out of 54 firms. Zero skewness cannot be rejected in a majority of cases (30 out of 54) whereas normal kurtosis cannot be rejected in only 8 cases. Thus, the market model residuals, in general, exhibit nonnormality with fat tails. This result is consistent with the findings of previous researchers (e.g., Brown and Warner 1985).

Table 5.2 shows the maximum likelihood estimates of the GARCH market model. The table includes estimates of market model parameters, α_i's, β_j's, $1/\nu$ and the best model (based on the likelihood ratio test). The model is estimated using different starting values for the parameters to ensure that global maxima are obtained in each case. The sum of α_i's and β_j's is less than unity in most of the cases, indicating that the process has a finite conditional variance. Comparing the market model beta estimates of OLS and GARCH models, it can be seen that the GARCH estimates are, on average, about 30%-40% lower than the OLS estimates.

The results from Table 5.2 suggest that the Student-t distributed model provides a better fit than the normal for 37 firms. To check goodness of fit, Pearson χ^2 test is performed on the high exposure group of stocks. This test provides a statistical comparison of the theoretical distribution based on the estimated parameters and the empirical distribution of the standardized residuals, $e_t/\sqrt{h_t}$. The results of Pearson

test, shown in Table 5.3, indicates that the Student-t distribution provides a good fit in 7 cases and the null hypothesis of a good fit is rejected in 6 cases.

B. Event Study Results

This section discusses event study results for each event using the OLS and the GARCH models. Each table shows average excess returns (ARs) and cumulative average excess returns (CARs) for high exposed banks, medium exposed banks, all exposed banks, and non-exposed banks. The t-statistics are shown in parentheses. The event day is designated as day '0'. A discussion of results for each event follows.

1. Borrower-induced Events

Mexican Moratorium

The event study results for the Mexican moratorium announcement using OLS are reported in Table 5.4. For the set of all banks with Latin American debt exposure the results indicate a negative average excess return of -1.77% on the event day with a t-statistic of -7.70. In contrast, for the sample of banks with no exposure to such debt the relevant returns are a positive 0.69% with a t-statistic of 1.93 which is not significant at the conventional 5% significance level. These results are consistent with those reported by previous studies such as Bruner and Simms (1987) and Lamy, Marr, and Thompson (1986). The high exposure group experienced excess

returns of -2.22% (t = -6.56) and the medium exposure group had -1.43% (t = -4.48).

The table also shows the CARs from day -1 through day +10. The CARs taken as the sum of the average excess returns between two points in time show the impact of the event over a period of time. The CARs for the zero exposure group and the exposed banks are mostly non-significant. The CARs for the medium exposure group are not significant till day 5 and become significant afterwards. In contrast, the CARs for the high exposure group remain significant throughout (day -1 to day +10), indicating that the event has a lasting impact on this set of banks. The CARs for the high exposure group increase from -1.83% (t = -3.74) to -4.46% (t = -3.19) between day -1 and day 10. Surprisingly, the medium exposure group have positive CARs from day 5 (1.50%) to day 10 (2.84%).

Table 5.5 shows the event study results using GARCH model. The abnormal return, ϵ_t, and conditional variance, h_t, for day -11 are used to calculate ϵ_t, and h_t from day -10 to day +10. The difference in the OLS and the GARCH models may be analyzed with respect to three measures: the significance level (as measured by the t-statistics), the excess return (AR), and the daily conditional variance, h_t.

Considering the high exposure group, the significance level for OLS and GARCH is different on day -5 and day 8. On day -5, the t-statistics for OLS is -3.19 and for GARCH it is only -1.97. On day 8, the excess return is significant for

OLS at 95% level and insignificant for GARCH. For medium exposure group, the significance levels are different for the two models on day -10, day 1, day 2, and day 6. For zero exposure group, the excess returns are significant (at 95% level) with GARCH on day -9, day 1, day 5 and day 9, and are not significant with OLS. In general, the t-statistics for GARCH model are smaller than that for the OLS model in the case of high exposure group whereas the opposite is true for zero exposure group. For the medium exposure group, no general pattern can be delineated.

A possible explanation of the difference in t-statistics obtained may lie in comparing the daily conditional variances of GARCH and the average residual variance for the OLS, which are used in calculating the respective t-statistics. For high exposure group, the daily conditional variances (h_t) are consistently higher than the average residual variance by about 30%-60% and it is exactly the opposite case (except on days -10 to -6 and day 10) for zero exposure group. For medium exposure group, the h_ts are, in general, higher than the OLS variance. Another interesting observation is that for high exposure group, the conditional variance started increasing from day -1 through day 3 and then started declining. On day -1 there is an increase of about 25% in daily variance. For medium exposure group, the variance increased from day -3 through day 2.

The above findings are in tune with the results of

previous studies by Beaver (1968), Patell and Wolfson (1979), Kalay and Lowenstein (1983), Christie (1983) and Ohlson and Penman (1985), which establish a substantial increase in variance of a security's return around the event dates. The conditional variance remained fairly stable in the case of zero exposure group. Thus, the effect of the event for the three groups on the first and second moments of the security returns is consistent.

The excess returns as measured by the two models do not differ substantially except in a few cases. For example, the AR on day -2 for the medium exposure group using the GARCH is higher by 62% than that for the OLS. For the zero exposure group the AR for GARCH is less than that for the OLS by 37% on day 1. The average beta with the GARCH model is less than the average beta with the OLS by 6% to 13%. However, this difference in beta is not translated into a difference in daily excess returns during the event period due to very low market returns on these days.

The excess returns are significant for the five days (except on day -4) prior to the event date. It seems there is a lot of activity in the market before the Mexican moratorium event. For example, the Wall Street Journal reports that on August 17 (day -2) the stock prices soared and the trading reached near record level. To incorporate all the information prior to the event, the GARCH model is estimated again from day -253 to day -3. The excess returns and the t-statistics

are calculated using the new estimates and the results are shown in Table 5.6. The results are very similar to those in Table 5.5.

Since the Student-t distribution did not provide a good fit in a number of cases (Table 5.3), the GARCH model is estimated again for the high exposure group using normal distribution assumption for all the stocks. The average excess returns and daily conditional variance for the Mexican moratorium event calculated under the normal distribution assumption are found to be similar to the results reported in Table 5.4. Thus, the assumption of the underlying distribution of the market model residuals does not seem to make much difference in the event study results with GARCH model.

In the next stage, the set of exposed banks are disaggregated into subsamples of capital sufficient banks and capital deficient banks based on each bank's ratio of primary capital to assets in comparison to the applicable regulatory minimum. The results are reported in Table 5.7. Average excess returns for the set of exposed banks that possess sufficient regulatory capital is -1.34% while average excess returns for capital deficient banks are -2.64%, a decline that is approximately twice in magnitude. Both figures are statistically significant at the 1% confidence level. The capital deficient group produced highly significant CARs which increase from -2.91% (t = -5.14) to -6.17% (t = -3.38) between

day -1 and day 10. The capital sufficient banks have positive CARs which increase from 1.82% (t = 2.36) to 2.79% (t = 2.63) between day 6 and day 10. Thus, the results indicate that the capital deficient banks experienced highly significant and lasting negative excess returns following the Mexican moratorium announcement.

<u>**Argentinean Moratorium**</u>

The event study results using OLS are reported in Table 5.4, where the event day is t = +10. The non-exposed banks have average excess returns on the event day close to zero and are not statistically significant. In contrast, for the set of all exposed banks the excess return is -0.72% with a t-statistics of -2.70. Among the exposed banks, the high exposed group experienced an average excess return of -1.30% (t = -2.93) and the medium exposure group has statistically non-significant negative excess returns.

The event study results with GARCH model, shown in Table 5.5, and 5.6, are very similar to the OLS results. The only difference is that, for the high exposure group, the average excess returns are significant at 1% confidence level (t = -2.93) for the OLS model and are significant at 5% level (t = -2.15) for the GARCH model.

The disaggregation of exposed banks into capital sufficient and capital deficient subsamples resulted in average excess returns of -1.74% (t = -3.49) for capital deficient banks (Table 5.7). In contrast, the average excess

returns for capital sufficient banks with Latin American debt exposure are close to zero on the announcement day.

Bolivian Moratorium

Information about the Bolivian moratorium arrived on two consecutive days: May 31, 1984, and June 1, 1984. The Wall Street Journal of May 31, 1984, reported an unconfirmed news item that Bolivia may suspend payments on its foreign debt. The next day the Bolivian government officially declared suspension of payments. Hence, a two-day event period (day -1 and day 0) approach was adopted for the analysis.

From Table 5.8, the average excess returns for all exposed banks are -0.60% (t = -2.73) on day 0 and -1.12% (t = -3.53) for two days. The excess returns are not significant for the non-exposed group. Among the exposed group, the high exposure group has two-day excess returns of -2.18% (t = -4.62) which are of similar magnitude to those for the Mexican moratorium event (-2.22%). The medium exposure group experienced insignificant excess returns.

It is seen from Table 5.9 that the capital deficient group had an average excess return of -1.94% (t = -3.97) on day 0 and -4.00% (t = -5.77) for the two-day period. In contrast, the capital sufficient group had insignificant excess returns. Thus, the market clearly distinguished capital deficient and capital sufficient banks.

The CARs also show the differential impact of the event on different categories of banks. The zero exposure group has

insignificant CARs whereas the exposed banks have increasing and significant CARs. Among the exposed banks, the subset of capital sufficient banks have insignificant CARs. For the capital deficient group, the CARs increase from -4.00% (t = -5.77) to -6.46% (t = -3.96), implying that the event has a lasting impact on this group.

Brazilian Moratorium

The OLS results of the Brazilian announcement as shown in Table 5.10, indicate that the group of all exposed banks have average excess returns of -1.12% (t = -4.64) on day 0 and -1.35% (t = -4.08) for the two-day period. On the other hand, the non-exposed banks have insignificant excess returns. For the high exposure group, the event effect is felt on two consecutive days: an average excess return of -0.91% on day -1 and -1.98% on day 0, both being significant at 5% level. The two-day return for this group is -2.88% (t = -5.36). In contrast, the moratorium announcement has no effect on the medium exposure group. The pattern of CARs is similar to that observed for the Mexican and the Bolivian moratoria.

The exposed banks were not partitioned according to sufficiency of capital for this event because all the banks in the sample met the requirement of regulatory capital. The mean primary capital ratio of the group of all exposed banks at the end of 1986 is 7.23%. Between 1982 and 1986, banks have built up sufficient capital to satisfy regulatory requirements.

The event study results of the Brazilian moratorium using the GARCH model are shown in Table 5.11. In general, the results with the OLS and the GARCH models are very similar except in a few cases. For example, the excess returns for the high exposure group on day -8 are significant at 5% confidence level with the GARCH model whereas they are not significant with the OLS model. For the medium exposure group, the average excess return on day 7 is higher for the OLS model than that for the GARCH model by about 21%. They also differ in significance levels ($t = -2.76$ for OLS and $t = -2.01$ for the GARCH). For the zero exposure group, the excess returns on day 6 are significant at 1% level ($t = 2.91$) for the GARCH model and insignificant for the OLS model. The average beta for each group with the GARCH model is less than the corresponding beta for the OLS model: the difference ranging from -6.3% for the high exposure group to -19.3% for the zero exposure group. The differences between the OLS and the GARCH models are less pronounced in the case of the Brazilian moratorium event than for the Mexican moratorium event.

The results for the OLS and the GARCH models suggest that the GARCH model does not make significant difference in this study. Hence, for the remaining events, only the OLS results are reported.

2. Lender-induced Events

Citicorp Loan-Loss-Provision Event

The event study results of the Citicorp loan-loss enhancement are shown in Table 5.12. The results indicate non-significant excess returns for all groups of banks on the event day. On the other hand, Citicorp experienced negative, but insignificant, excess returns of -1.08% on day 0. The next two days (day 1 and day 2) the firm has significant positive excess returns of 5.57% (t = 4.13) and 4.63% (t = 3.43). Hence, the results suggest that investors treated the event as a firm-specific event rather than as an event with industry-wide ramifications. However, logically a mere accounting adjustment (loan-loss-provision involves transfer of funds from profit and loss account to the reserve for loan-loss account) should not result in positive excess returns of about 10% in two days for Citicorp. One possible explanation is that Citicorp's action reduced uncertainty and allowed the bank more bargaining power in its negotiations with the troubled debtor countries.

3. Events Initiated by Borrower and Lender

Mexican Debt-Rescheduling Agreement

The results of the Mexican debt rescheduling agreement event, shown in Table 5.13, indicate average excess returns of -0.83% (t = -3.01) on the event day for the exposed banks and insignificant excess returns for the non-exposed banks. Among

the exposed banks, the high exposure group experienced significant excess returns of -1.12% (t = -2.51) whereas the medium exposure group have insignificant excess returns. But, the pattern of CARs is quite different for the medium- and high-exposure groups for this event as compared to other events. The CARs for the high exposure group are insignificant and return to zero, whereas they increase from day -1 to day 3 and remain significant for the medium exposure group. The group of exposed banks, as a whole, experience significant CARs. As in other events, the CARs for the zero exposure group remain insignificant.

The agreement between Mexico and the creditor banks in 1986 was hailed as a model for other debtor countries. The agreement provides for additional loans and restructuring of the existing loans over a long period. The interest margin is also reduced to less than 1% over the LIBOR rate. These terms of the agreement, especially the new additional lending and reduction in spread that results in reduced earnings for the banks, may have triggered off an unfavorable reaction from the investors resulting in negative returns for the high exposure group of banks.

4. External Events

Falkland War

The Falkland war event is analyzed for two dates: April 2, 1982, when Argentina invaded the Falklands and May 5, 1982,

when Argentina devalued the peso by 14.3%.

Table 5.14 shows the results of Falkland war event for the first event date. The average excess returns for all groups of banks are insignificant on day 0 and day -1. Thus, the beginning of the Falkland war has no effect on stock prices of the banks with Latin American loans, probably because it was treated as a political event. In contrast, the second event has significant effect as shown in Table 5.15. On day 0, the banks exposed to Latin America have average excess returns of -0.57% (t = -2.07) and the zero exposure group have insignificant excess returns. The exposed group experienced significant excess returns of -0.74% (t = -2.78) on day -2 and -0.52% (t = -2.06) on day -1. On day -2 an Argentine cruiser was sunk with 1852 men on board and on day -1 a British destroyer was sunk. These events indicate the intensification of the war. The two-day (day -1 and 0) excess returns for the exposed group are -1.08% (t = -2.94) which are of similar magnitude to the excess returns of moratorium announcements. The high exposure group have significant average excess returns of -0.70% (t = -2.00) on day -2, -0.83% (t = -2.48) on day -1, and -1.02% (t = -2.48) on day 0. The two-day excess returns for the high exposure group add up to -1.84% (t = -3.34) and the corresponding figure for the Mexican moratorium event is -1.83 (t = -3.74). The similarity of investor reaction to the Falkland war and the Mexican moratorium events, suggests that investors started

discounting the Latin American debt even before the Mexican moratorium event.

Legislative Actions

The results of the legislative events are reported in Table 5.16. The exposed banks experienced average excess return of 0.66% (t = 2.26) on the day of introduction of the legislation (S. 695) proposing an increase in the U.S. quota to the IMF. The unexposed sample did not react significantly. Investors may have viewed the increased U.S. support for the IMF favorably. On the other hand, the passage of S. 695 in the Senate on June 8, 1983, evoked a negative reaction by the stockholders. According to Billingsley and Lamy (1988) the reason for this result is the investors' suspicion that the increased IMF protection needs additional constraints on foreign lending.

Perhaps, the negative excess returns for the exposed banks on two consecutive days (day 0 and day 1) may have been caused by another event. The Wall Street Journal of June 10, 1983, reports that capital rules were set by regulators for big banks. The big (multinational) banks were not brought into the purview of the capital regulation in 1981, so as to give them sufficient time to build up required capital. The international debt crisis hastened the process and the capital regulation was extended to the big banks with low capital ratios in 1983. The result is negative reaction by the investors for the exposed banks. Billingsley and Lamy (1988)

did not consider the capital aspect in their explanation of the controversy.

To summarize, the excess returns are significant only on the day of introduction of the proposal to increase the U.S. quota to the IMF and insignificant for the ILSA. The subsequent stages of the legislation evoked no response from the investors. It seems that the investors valued the support of the U.S. to the IMF favorably.

Cartagena Declaration

The results of the Cartagena declaration event are presented in Table 5.17. The exposed group have positive average excess returns of 0.68% (t = 3.08) on the event day and the non-exposed group have no effect. Among the exposed banks, the high exposed group have insignificant excess returns whereas the medium exposure group have significant positive excess returns of 0.73% (t = 2.41). The two-day (day -1 and 0) excess returns for all the groups are not statistically significant. The cumulative excess returns for all the groups are mostly insignificant. Investors recognized the fact that the Latin American countries did not form a debtor cartel at Cartagena and pledged to fulfill their commitments to repay their external debts, resulting in positive returns. However, investor reaction is not strong indicating that the investors treated the event as predominantly political.

Peru's Declaration

The event study results of Peru's declaration (Table 5.18) indicate that the event has no significant effect on any group of banks. Peru, with a foreign debt of $14 billion, is a small debtor. Peru's President-elect declared that his country would limit the repayments to not more than 10% of the country's export earnings. He unsuccessfully tried to organize other Latin American countries to accept his stand. Investors might have treated the declaration as a political event without any economic implications.

Baker Plan

The results of Baker plan event are presented in Table 5.19. The high exposure group have average excess returns of 1.17% (t = 3.08) on day -1 and 0.92% (t = 2.75) on day 0, for a two-day excess return of 2.09% (t = 4.12). The exposed banks as a group have excess returns of 0.58% (t = 2.22) on day -1, 0.61% (t = 2.73) on day 0, and a two-day return of 1.19% (t = 3.50). The event has no effect on medium exposure and zero exposure groups. The CARs for the exposed banks are positive and remain significant, implying a lasting effect of the event. The CARs for the high exposure group increase from 2.09% (t = 4.12) to 3.93% (t = 5.28) between day -1 and day 3. The results suggest a strong positive reaction from the market. The investors treated the announcement of Baker plan as a positive response from the government to the worsening political and economic situation in Latin America. Although

Baker plan does not suggest bailing out of banks by the government, it does indicate that the government is concerned with the problem and is willing to exercise its political and economic clout in solving the debt crisis.

Slump in Oil Prices

The event study results for the slump in oil prices in February 1986 are shown in Table 5.20. The non-exposed group have little effect on any day. The exposed group experienced average excess returns of -1.04% (t = -3.41) on day 0 and -1.43% (t = -5.82) on day 1 for a total two-day (day 0 and 1) excess return of -2.47%. The corresponding excess returns for the high exposure group are -1.94% (t = -6.01%) on day 0 and -2.05% (t = -5.85) on day 1, and about -4.00% for the two days. For the medium exposure group, the excess returns are insignificant on day 0, but on day 1 the excess returns are -0.90% (t = -2.40).

This is a purely exogenous and unanticipated event. The fall in oil prices was steep and sudden. In October 1985, the Baker plan was announced to solve the debt crisis. The decline in oil prices jeopardized the Baker plan even before it was tried. The impact of the declining oil prices on the Mexican and the Venezuelan economies is devastating. Press reports indicated that Mexico may demand for additional debt. Mexico and Venezuela called for an emergency meeting of the 'Cartagena Group' to discuss ways to ease the Latin American debt burden. Another news item reported that banks with big

loans to Mexico were concerned about the impact of the falling oil prices (WSJ 1/27/1986). Thus, this event has information content for banks with Latin American loans as reflected in the stock prices.

The results of all events are summarized in Table 5.21. The table shows the average excess returns on the event day (or for two-day period, wherever appropriate) for all the events analyzed. The non-exposed group of banks have consistently insignificant excess returns for all events (except for two days relating to the legislative actions). Thus, this group serves as an effective control group which helps in distinguishing between industry-wide events and events related to the Latin American problem. The impact of the events on the exposed banks is consistent with prior predictions. The predominantly political events (the beginning of the Falkland war and the declaration by Peru's president) have no effect on the set of all exposed banks. The Cartagena declaration event has a mild effect on medium exposure group and no effect on the high exposure group. The four moratoria, as a class, have consistently negative impact on the exposed banks. The purely exogenous events, the Falkland war involving the devaluation of peso, the Baker plan, and the slump in oil prices, which have wide economic ramifications on the loan portfolios of the banks with Latin American debt have resulted in significant excess returns. The debt-rescheduling agreement between Mexico and the

creditor banks, the only event involving both the borrower and lenders, is considered as unfavorable to the value of the banks, although the agreement is hailed as a model for other debtor countries. Citicorp's loan-loss-provision event, the only event initiated by the creditor banks, is treated as a firm-specific event resulting in significant excess returns only for Citicorp. Baker plan and Cartagena declaration events have positive information content whereas all other events conveyed unfavorable news.

The differential impact of the events on the high- and medium-exposure groups is clearly brought out in Table 5.21. The impact of all events (except, the Cartagena declaration event) is very strong and highly significant for the high exposed banks. The excess returns are close to 2% for each event. On the other hand, the excess returns for the medium exposure group are much less than those for the high exposure group. For most of the events, the impact on the medium exposure banks is insignificant.

The CARs also show a consistent pattern for the events. The CARs for non-exposed group are mostly insignificant for all the events. For the high exposure group, the CARs for most of the events are highly significant, suggesting that the events have a lasting effect. The medium exposure group have mostly insignificant CARs. The exception to this general pattern is the Mexican debt-rescheduling event for which the CARs for the medium exposure group are significant and those

for the high exposure group are not. The events, in general, have a lasting effect on the group of all banks with Latin debt in that the CARs do not return to zero.

5. On the Significance of Excess Returns Before the Event

In a pure (i.e., totally unanticipated) event study, the excess returns in the pre-event period should be insignificant. As information about the event reaches the market on the event day, there will be significant change in the returns of the stocks affected by the event, if the event has information content to affect the net present value of the firm. However, if the event is anticipated (fully or partially) or if information leading to the event reaches the market before the event, then the average excess returns before the event may be significant.

In the present study, the excess returns (during the interval day -10 to day -1) are found to be statistically significant before the event day. For example, in the case of the Mexican moratorium event, the group of banks with Latin American loans, experienced average excess returns of -0.49% on day -5, 1.36% on day -3, 1.03% on day -2, and 1.21% on day -1, which are all statistically significant.

Bruner and Simms (1987) do not report daily average excess returns prior to the event day. Lamy, Marr, and Thompson (1986) report excess returns from day -30 through day +10, but none of them are significant, except the day 0 excess

returns. They point out that the market was driving up the prices of the bank stocks prior to the Mexican moratorium announcement. They argue that such a behavior is consistent with the IMF bailout theory since Mexico, the IMF and the Federal Reserve were close to finalizing a lending agreement. When the agreement was not reached, the market treated it as 'bad news'. Viswanathan and Philippatos (1989) note that the excess returns for the three days before the Mexican moratorium were positive and mostly significant; for the remainder of the test period (day -30 to day +30) the excess returns were evenly split between positive and negative. They attribute the positive excess returns and cumulative excess returns to the upward trend in the stock market from July 1982. Thus, the previous studies on the Mexican moratorium event did not take enough cognizance of the significant pre-event excess returns.

The events relating to the Latin American debt problem cannot be treated as pure events, wherein the information arrives in one burst on the event day. Information about Latin America reached the market continuously prompting the investors to change the valuation of bank assets as information arrived. In the case of some events, the information prior to the event may suggest the impending event. For example, one week before the Mexican moratorium event, the Mexican government devalued peso. Two days before, the government closed the foreign exchange markets and

announced that all money in foreign-currency accounts could only be withdrawn in pesos. Meanwhile, negotiations were in progress with the IMF and the Federal Reserve to arrange for credits. Thus, it is more appropriate to treat the events of the Latin American problem as 'partially anticipated' events.

Malatesta and Thompson (1985) define a partially anticipated event as an event with an ex ante probability that is positive, but less than one. They distinguish two types of effects for a partially anticipated event: the economic effect and the announcement effect. The economic effect is the difference in firm value given that the event occurs now and firm value given that the even does not occur (p. 237). It is the net present value of the event. An anticipated event still does not provide investors with information about the exact timing of the event. The announcement of the event resolves this uncertainty. Thus, the announcement effect is the change in firm value associated with the resolution of the uncertainty. The economic effect and the announcement effect are equal only when the prior probability of the event is zero. Malatesta and Thompson argue that in the case of partially anticipated events, the announcement effect is an attenuated measure of the event's economic impact. Thus, the event day results reported in this study may be considered as attenuated measures of the economic effect of the events. The results would have been stronger if the events were completely unanticipated.

As discussed in the previous chapter, the GARCH model is employed to incorporate the information arriving prior to the event. The model is estimated in two ways: from day -260 to day -10, and from day -253 to day -3. By estimating the model right up to day -3, all the information prior to the event can be taken into account. The results are not significantly different from the results of Ordinary Least Squares estimation method. The plausible explanation is that the economic impact of the events is very strong and it is not attenuated significantly by prior information.

C. Chapter Summary

This chapter tests the information content of events by measuring excess returns during the event period. The results indicate that all the events (except Peru's declaration event) produced significant excess returns for the group of U.S. banks with Latin American loans. In contrast, the non-exposed banks experienced no effect, which implies that the events convey information about the changing value of Latin American loans. The four moratoria, as a class, produced strong and consistent results. The market distinguished banks broadly as high-, medium-, and zero-exposure groups, as the excess returns vary systematically for each group. The excess returns also vary based on capital adequacy.

The results of the GARCH model, which is used to correct for heteroscedasticity in the OLS market model, show that the

correction has only marginal impact on the statistical tests of significance.

The events for which the event day excess returns are substantial and statistically significant are selected for further analysis in the next chapter. These events include the four moratoria, the Falkland war, and the Oil price slump event. The remaining six events-- Citicorp loan-loss provision event, legislative actions, Cartagena declaration, Peru's declaration, Mexican debt-rescheduling agreement, and Baker plan-- are dropped at this stage, either because the excess returns are not significant or are too low to warrant further analysis.

Table 5.1

Descriptive Statistics of Market Model Residuals for Mexican Moratorium Event Using Ordinary Least Squares Method

	Sym-bol	D-St (P)	Mean	Vari-ance (P)	Skew-ness (P)	Kurt-osis	D-W Stat.	Market Model Parameters a (t)	b (t)
1.	ASO	0.06 (.05)	0.00	0.0008	0.158 (.30)	0.18 (.55)	2.215	-0.0002 (-0.3)	0.19 (2.9)
2.	BAC	0.07 (.01)	0.00	0.0003	-0.035 (.82)	1.26 (.00)	1.783	0.0002 (0.2)	1.05 (9.1)
3.	BBI	0.07 (.01)	0.00	0.0003	0.643 (.00)	3.35 (.00)	2.406	-0.0001 (-0.1)	0.46 (4.0)
4.	BCL	0.08 (.01)	0.00	0.0004	0.470 (.00)	3.42 (.00)	1.922	-0.0010 (-0.9)	0.21 (1.5)
5.	BK	0.06 (.05)	0.00	0.0002	0.433 (.01)	2.42 (.00)	1.960	0.0010 (1.1)	0.56 (5.2)
6.	BKB	0.07 (.01)	0.00	0.0002	0.211 (.17)	3.77 (.00)	1.792	0.0003 (0.3)	0.60 (6.2)
7.	BT	0.04 (.20)	0.00	0.0003	0.083 (.59)	0.03 (.33)	1.991	0.0011 (1.1)	1.14 (9.7)
8.	CCI	0.05 (.15)	0.00	0.0002	0.082 (.59)	1.43 (.00)	1.830	0.0012 (1.3)	1.34 (12.8)
9.	CFB	0.24 (.01)	0.00	0.0004	3.099 (.00)	26.90 (.00)	2.343	0.0012 (0.9)	0.03 (0.8)
10.	CHL	0.05 (.10)	0.00	0.0002	0.124 (.42)	0.47 (.13)	1.946	0.0001 (0.01)	0.82 (8.2)
11.	CIL	0.10 (.01)	0.00	0.0004	-1.422 (.00)	6.64 (.00)	2.008	-0.0021 (-1.8)	0.77 (5.7)
12.	CKN	0.13 (.01)	0.00	0.0003	-4.875 (.00)	50.20 (.00)	2.171	-0.0016 (-1.5)	0.25 (2.1)
13.	CMB	0.09 (.01)	0.00	0.0002	-0.192 (.21)	3.93 (.00)	1.761	-0.0004 (-0.4)	0.98 (9.3)
14.	DEP	0.12 (.01)	0.00	0.0002	3.321 (.00)	31.00 (.00)	1.520	0.0022 (2.8)	0.08 (0.9)
15.	EQK	0.16 (.01)	0.00	0.0011	-2.397 (.00)	20.40 (.00)	2.357	-0.0019 (-0.9)	0.12 (0.5)
16.	FAC	0.09 (.01)	0.00	0.0003	0.114 (.46)	2.20 (.00)	2.023	-0.0002 (-0.2)	0.16 (1.3)

Table 5.1 (contd.)

	Sym-bol	D-St (P)	Mean	Vari-ance (P)	Skew-ness (P)	Kurt-osis	D-W Stat.	Market Model Parameters a (t)	b (t)
17.	FBF	0.08 (.01)	0.00	0.0002	-0.068 (.66)	1.34 (.00)	2.043	0.0000 (0.0)	0.24 (2.5)
18.	FBT	0.05 (.20)	0.00	0.0004	-0.155 (.31)	0.20 (.65)	2.044	-0.0018 (-1.4)	0.99 (6.6)
19.	FDU	0.05 (.10)	0.00	0.0001	0.099 (.52)	0.65 (.04)	1.955	-0.0001 (-0.1)	0.16 (1.9)
20.	FFB	0.07 (.01)	0.00	0.0002	0.181 (.24)	3.57 (.00)	2.354	0.0009 (1.1)	0.33 (3.4)
21.	FLT	0.07 (.01)	0.00	0.0002	0.218 (.16)	2.25 (.00)	1.729	0.0007 (0.8)	0.27 (3.1)
22.	FNB	0.08 (.01)	0.00	0.0003	0.174 (.26)	1.61 (.00)	1.930	0.0001 (0.1)	0.96 (7.3)
23.	FPA	0.09 (.01)	0.00	0.0014	0.052 (.74)	0.46 (.14)	2.494	-0.0009 (-0.3)	0.83 (3.1)
24.	FVB	0.07 (.01)	0.00	0.0004	0.416 (.01)	0.84 (.01)	2.582	0.0005 (0.4)	0.56 (3.8)
25.	FWB	0.06 (.05)	0.00	0.0002	-0.169 (.27)	1.39 (.00)	2.165	-0.0004 (-0.5)	0.31 (3.2)
26.	GB	0.12 (.01)	0.00	0.0013	0.104 (.50)	0.30 (.29)	2.549	-0.0006 (-0.3)	0.22 (0.9)
27.	GBS	0.06 (.05)	0.00	0.0002	0.430 (.01)	1.75 (.00)	1.908	0.0001 (0.10)	0.29 (2.9)
28.	HBC	0.05 (.20)	0.00	0.0003	0.380 (.01)	1.49 (.00)	2.146	0.0005 (0.5)	0.69 (5.8)
29.	HZB	0.08 (.01)	0.00	0.0002	0.212 (.17)	1.55 (.00)	2.471	0.0005 (0.5)	0.27 (2.7)
30.	I	0.09 (.01)	0.00	0.0002	0.856 (.00)	4.29 (.00)	2.141	-0.0007 (-0.7)	0.62 (5.6)
31.	IFC	0.07 (.01)	0.00	0.0004	-0.174 (.26)	2.12 (.00)	1.939	-0.0007 (-0.5)	0.93 (6.2)
32.	JPM	0.05 (.10)	0.00	0.0001	-0.034 (.82)	0.75 (.01)	1.747	0.0006 (0.8)	0.83 (9.9)

Table 5.1 (contd.)

	Sym- bol	D-St (P)	Mean	Vari- ance (P)	Skew- ness (P)	Kurt- osis	D-W Stat.	Market Model Parameters a (t)	b (t)
33.	M	0.06 (.05)	0.00	0.0002	0.412 (.01)	1.94 (.00)	1.859	-0.0008 (-0.8)	0.60 (5.3)
34.	MEL	0.05 (.15)	0.00	0.0002	0.204 (.19)	1.12 (.00)	1.796	-0.0004 (-0.5)	0.27 (2.9)
35.	MGT	0.17 (.01)	0.00	0.0007	-0.284 (.07)	2.19 (.00)	2.247	-0.0001 (-0.2)	0.26 (1.4)
36.	MHC	0.06 (.05)	0.00	0.0002	-0.087 (.57)	0.77 (.01)	1.968	0.0004 (0.4)	0.94 (9.9)
37.	MM	0.03 (.20)	0.00	0.0003	0.116 (.45)	0.15 (.62)	2.025	0.0002 (0.2)	0.91 (7.5)
38.	NBA	0.12 (.01)	0.00	0.0003	1.800 (.00)	11.80 (.00)	1.484	0.0027 (2.5)	0.13 (1.1)
39.	NBD	0.04 (.20)	0.00	0.0001	0.279 (.07)	1.38 (.00)	1.933	-0.0004 (-0.7)	0.30 (3.4)
40.	NCB	0.05 (.10)	0.00	0.0002	0.584 (.00)	0.73 (.02)	2.296	0.0001 (0.1)	0.49 (5.2)
41.	NOB	0.05 (.20)	0.00	0.0003	-0.247 (.11)	0.98 (.00)	2.115	-0.0006 (-0.5)	0.53 (4.1)
42.	RNB	0.07 (.01)	0.00	0.0002	0.918 (.00)	3.66 (.00)	1.778	-0.0013 (-1.6)	0.52 (5.3)
43.	SBK	0.04 (.20)	0.00	0.0002	0.128 (.40)	0.38 (.22)	2.436	0.0013 (1.3)	0.40 (3.6)
44.	SFB	0.06 (.05)	0.00	0.0004	0.324 (.04)	1.98 (.00)	2.253	-0.0005 (-0.4)	0.58 (4.1)
45.	SFC	0.09 (.01)	0.00	0.0004	-1.824 (.00)	13.00 (.00)	1.981	-0.0020 (-1.6)	0.73 (5.0)
46.	SPC	0.07 (.01)	0.00	0.0002	-0.343 (.03)	4.69 (.00)	1.928	-0.0005 (-0.6)	0.55 (5.9)
47.	STB	0.09 (.01)	0.00	0.0004	0.166 (.28)	1.96 (.00)	2.142	-0.0006 (-0.5)	0.24 (1.6)
48.	STL	0.10 (.01)	0.00	0.0005	0.714 (.00)	3.19 (.00)	2.242	-0.0002 (-0.1)	0.39 (2.4)

Table 5.1 (contd.)

	Sym-bol	D-St (P)	Mean	Vari-ance (P)	Skew-ness (P)	Kurt-osis	D-W Stat.	Market Model Parameters a (t)	b (t)
49.	TCB	0.05 (.15)	0.00	0.0003	0.168 (.28)	0.99 (.00)	2.061	-0.0002 (-0.2)	0.68 (5.1)
50.	UJB	0.05 (.15)	0.00	0.0003	0.344 (.03)	0.68 (.03)	2.470	0.0009 (0.8)	0.56 (4.2)
51.	V	0.07 (.01)	0.00	0.0002	-0.172 (.27)	2.22 (.00)	1.813	-0.0007 (-0.8)	0.49 (5.0)
52.	WB	0.06 (.05)	0.00	0.0002	0.265 (.09)	0.91 (.00)	2.085	0.0006 (0.7)	0.45 (4.6)
53.	WFC	0.08 (.01)	0.00	0.0003	1.023 (.00)	3.18 (.00)	2.008	-0.0005 (-0.5)	0.76 (6.2)
54.	WYO	0.09 (.01)	0.00	0.0002	0.752 (.00)	2.71 (.00)	2.108	-0.0006 (-0.6)	0.38 (3.6)

Estimation period 250 days (t = -260 to t = -11) before the Mexican moratorium event.

P = p-value
t = t-statistics
D-St = Kolmogorv-Smirnov D-statistics for normality
D-W Stat. = Durbin-Watson Statistics

Table 5.2

Maximum Likelihood Estimates of GARCH Market Model
For Mexican Moratorium Event

	Symbol	Market Model Parameters a	b	ω ('000)	α_1	β_1	$\alpha_1+\beta_1$	Model	1/ν
1.	ASO	-0.0002 (-0.3)	0.20 (3.0)	0.0853 (11.20)	-	-	-	OLS	-
2.	BAC	-0.0002 (-0.2)	1.10 (10.1)	0.0432 (1.12)	0.1332 (1.65)	0.6929 (3.43)	0.8261	GARCH	-
3.	BBI	-0.0005 (-0.5)	0.43 (4.3)	0.2581 (6.33)	-	-	-	OLS	0.2084 (3.31)
4.	BCL	-0.0019 (-1.7)	0.29 (2.5)	0.4267 (4.43)	-	-	-	OLS	0.2619 (3.57)
5.	BK	0.0007 (0.8)	0.52 (5.7)	0.2159 (8.21)	-	-	-	OLS	0.1570 (2.77)
6.	BKB	-0.0001 (-0.1)	0.50 (6.5)	0.0255 (1.28)	0.1836 (1.64)	0.6951 (4.76)	0.8787	GARCH(t)	0.2237 (14.49)
7.	BT	0.0010 (0.1)	1.14 (9.7)	0.2623 (11.60)	-	-	-	OLS	-
8.	CCI	0.0009 (1.0)	1.38 (14.0)	0.2082 (7.93)	-	-	-	OLS	0.1419 (4.19)
9.	CFB	0.0002 (0.3)	0.04 (0.6)	0.0074 (2.24)	0.0633 (2.54)	0.8802 (24.50)	0.9435	GARCH(t)	0.2839 (6.73)
10.	CHL	0.0001 (0.1)	0.81 (8.5)	0.1948 (12.12)	-	-	-	OLS	-
11.	CIL	-0.0012 (-1.6)	0.50 (6.3)	0.0069 (0.92)	0.1505 (2.08)	0.8578 (12.96)	1.0083	GARCH(t)	0.2510 (20.72)
12.	CKN	-0.0004 (-0.6)	0.46 (5.8)	0.1340 (4.30)	0.3856 (1.89)	-	0.3856	ARCH(t)	0.2543 (17.61)
13.	CMB	0.0001 (0.2)	0.91 (11.7)	0.0000 (0.00)	0.0608 (2.37)	0.9554 (32.85)	1.0162	GARCH(t)	0.2093 (2.74)
14.	DEP	0.0018 (3.5)	-0.03 (-0.6)	0.1554 (1.96)	-	-	-	OLS	0.3824 (5.46)
15.	EQK	-0.0015 (-0.9)	0.13 (0.7)	0.8308 (5.98)	0.1582 (1.04)	-	0.1582	ARCH(t)	0.2329 (11.21)
16.	FAC	-0.0009 (-0.9)	0.16 (1.3)	0.0500 (1.08)	0.1175 (1.45)	0.7315 (3.97)	0.8490	GARCH(t)	0.2037 (4.24)

Table 5.2 (contd.)

	Sym-bol	Market Model Parameters a	b	ω ('000)	α_1	β_1	$\alpha_1+\beta_1$	Model	1/ν
17.	FBF	0.0005 (0.6)	0.22 (2.3)	0.1866 (6.16)	-	-	-	OLS	0.1782 (13.83)
18.	FBT	-0.0018 (-1.3)	1.01 (6.1)	0.4418 (11.14)	-	-	-	OLS	-
19.	FDU	-0.0001 (-0.1)	0.17 (1.8)	0.1342 (11.6)	-	-	-	OLS	-
20.	FFB	0.0007 (1.0)	0.22 (2.5)	0.1602 (4.35)	0.1898 (1.33)	-	0.1898	ARCH(t)	0.2557 (7.74)
21.	FLT	0.0006 (0.9)	0.26 (3.9)	0.0154 (1.37)	0.1950 (1.83)	0.7386 (6.17)	0.9336	GARCH(t)	0.2391 (2.37)
22.	FNB	-0.0006 (-0.7)	0.88 (7.6)	0.0368 (0.99)	0.1135 (1.42)	0.8071 (5.88)	0.9206	GARCH(t)	0.2688 (3.48)
23.	FPA	-0.0006 (-0.3)	0.83 (3.3)	0.1415 (11.75)	-	-	-	OLS	-
24.	FVB	0.0009 (0.6)	0.57 (4.7)	0.4227 (12.55)	-	-	-	OLS	-
25.	FWB	-0.0003 (-0.4)	0.26 (3.3)	0.1322 (5.16)	0.2822 (2.01)	-	0.2822	ARCH(t)	0.1659 (2.33)
26.	GB	-0.0009 (-0.4)	0.20 (0.7)	0.1277 (9.99)	-	-	-	OLS	-
27.	GBS	-0.0001 (-0.1)	0.34 (4.2)	0.0266 (1.36)	0.1736 (1.84)	0.7014 (4.90)	0.8750	GARCH(t)	0.1782 (7.88)
28.	HBC	-0.0003 (-0.3)	0.61 (6.0)	0.0580 (1.44)	0.2447 (1.87)	0.5682 (2.78)	0.8129	GARCH(t)	0.1200 (2.32)
29.	HZB	0.0001 (0.2)	0.22 (2.6)	0.1393 (5.81)	0.3077 (2.37)	-	0.3077	ARCH(t)	0.1187 (8.55)
30.	I	-0.0016 (-2.2)	0.47 (5.4)	0.0259 (1.46)	0.1722 (1.53)	0.7344 (5.55)	0.9066	GARCH(N)	-
31.	IFC	-0.0014 (-1.2)	0.72 (5.6)	0.0001 (0.66)	0.0460 (1.45)	0.9335 (17.52)	0.9795	GARCH(t)	0.2061 (14.41)
32.	JPM	0.0005 (0.7)	0.74 (9.4)	0.1089 (5.84)	0.2193 (1.61)	-	0.2193	ARCH(t)	0.1492 (2.86)

Table 5.2 (contd.)

	Symbol	Market Model Parameters a	b	ω ('000)	α_1	β_1	$\alpha_1+\beta_1$	Model	1/ν
33.	M	-0.0013	0.54	0.2595	-	-	-	OLS	0.2092
		(-1.4)	(5.1)	(5.32)					(11.73)
34.	MEL	-0.0006	0.27	0.1676	-	-	-	OLS	0.1455
		(-0.8)	(3.0)	(7.21)					(7.87)
35.	MGT	0.0005	0.24	0.5982	0.2791	-	0.2791	ARCH(t)	0.2468
		(0.3)	(1.5)	(3.65)	(1.73)				(3.43)
36.	MHC	0.0004	0.88	0.1737	-	-	-	OLS	0.1587
		(0.4)	(10.2)	(5.87)					(5.22)
37.	MM	-0.0001	0.93	0.2791	-	-	-	OLS	-
		(-0.1)	(7.7)	(11.0)					
38.	NBA	0.0013	0.14	0.0263	0.1587	0.7647	0.9234	GARCH(t)	0.2703
		(1.8)	(1.7)	(1.43)	(1.70)	(6.56)			(7.98)
39.	NBD	-0.0007	0.26	0.1495	-	-	-	OLS	0.1309
		(-0.9)	(3.1)	(8.18)					(8.31)
40.	NCB	0.0000	0.48	0.1717	-	-	-	OLS	-
		(0.0)	(4.9)	(11.2)					
41.	NOB	-0.0006	0.41	0.3391	-	-	-	OLS	0.1696
		(-0.5)	(3.0)	(5.83)					(6.16)
42.	RNB	-0.0022	0.39	0.1924	-	-	-	OLS	0.2580
		(-3.0)	(4.3)	(4.84)					(4.98)
43.	SBK	0.0013	0.41	0.2374	-	-	-	OLS	-
		(1.3)	(3.9)	(11.3)					
44.	SFB	-0.0011	0.44	0.0855	0.1316	0.6574	0.7890	GARCH(t)	0.1997
		(-1.0)	(3.7)	(1.13)	(1.33)	(2.72)			(4.95)
45.	SFC	-0.0009	0.52	0.0337	0.1068	0.8021	0.2341	GARCH(t)	0.2341
		(-1.0)	(5.0)	(1.43)	(1.65)	(8.05)			(3.76)
46.	SPC	-0.0002	0.44	0.1618	-	-	-	OLS	-
		(-0.3)	(5.6)	(6.11)					
47.	STB	-0.0010	0.18	0.4739	-	-	-	OLS	0.2719
		(-0.9)	(1.5)	(3.33)					(9.85)
48.	STL	-0.0013	0.23	0.3381	0.2855	-	0.2855	ARCH(t)	0.1817
		(-1.2)	(1.6)	(6.50)	(1.94)				(14.41)

Table 5.2 (contd.)

	Sym-bol	Market Model Parameters a	b	ω ('000)	α_1	β_1	$\alpha_1+\beta_1$	Model	1/ν
49.	TCB	-0.0004 (-0.4)	0.60 (4.8)	0.0554 (1.15)	0.1509 (1.79)	0.6911 (3.62)	0.8420	GARCH(t)	0.1319 (3.09)
50.	UJB	0.0015 (1.4)	0.44 (4.0)	0.0036 (0.40)	0.0644 (1.89)	0.9237 (18.19)	0.9881	GARCH(N)	-
51.	V	-0.0008 (-1.0)	0.41 (4.8)	0.0000 (0.00)	-	-	-	OLS	0.2627 (3.30)
52.	WB	0.0002 (0.2)	0.35 (3.9)	0.0212 (1.83)	0.1948 (2.66)	0.7021 (6.96)	0.8969	GARCH(N)	-
53.	WFC	-0.0016 (-1.6)	0.71 (6.4)	0.2769 (8.23)	-	-	-	OLS	-
54.	WYO	-0.0012 (-1.4)	0.35 (3.6)	0.2207 (5.18)	-	-	-	OLS	0.2348 (6.92)

Estimation period 250 days (t = -260 to t = -11) before the Mexican moratorium event

t-statistics in paretheses

Table 5.3

Goodness of Fit Test Results for High Exposure Group of U.S. Banks for Mexican Moratorium Event (Student-t distribution)

Stock	χ^2 value
BAC	29.67
BK	25.97
CCI	24.35
CIL	38.23*
CKN	26.10
CMB	41.47*
FNB	34.99*
FWB	35.22*
MHC	28.74
RNB	45.17*
SFC	24.58
V	52.12*
WFC	28.05

The critical value at 95% confidence level is 32.67. A '*' indicates that the null hypothesis of t- distribution is rejected.

Table 5.4

Excess Returns and Cumulative Excess Returns around Mexican Moratorium Event Using OLS model (according to exposure level) (Event Date 820819)

Panel A: Daily Average Excess Returns				
Day	High Exposure Group	Medium Exposure Group	All Exposed Group	Zero Exposure Group
-10	0.0021	-0.0042	-0.0015	0.0031
	(0.47)	(-1.43)	(-0.77)	(0.50)
-9	-0.0071	-0.0001	-0.0030	-0.0043
	(-1.24)	(0.10)	(-0.74)	(-1.16)
-8	0.0050	-0.0104	-0.0037	-0.0166
	(1.44)	(-2.79)**	(-1.15)	(-3.00)**
-7	0.0021	0.0015	0.0017	0.0076
	(0.02)	(0.47)	(0.37)	(1.38)
-6	-0.0006	-0.0022	-0.0015	-0.0020
	(0.16)	(-0.74)	(-0.45)	(-0.64)
-5	-0.0114	-0.0002	-0.0049	0.0048
	(-3.19)**	(-0.04)	(-2.14)*	(1.03)
-4	0.0023	-0.0009	0.0005	-0.0075
	(0.69)	(-0.48)	(0.09)	(-1.25)
-3	0.0181	0.0102	0.0136	0.0121
	(3.86)**	(3.06)**	(4.84)**	(2.34)*
-2	0.0172	0.0050	0.0103	0.0019
	(3.99)**	(1.66)	(3.88)**	(-0.18)
-1	0.0039	0.0185	0.0121	0.0105
	(1.28)	(6.20)**	(5.50)**	(2.06)*
0	**-0.0222**	**-0.0143**	**-0.0177**	**0.0069**
	(-6.56)**	**(-4.48)****	**(-7.70)****	**(1.93)**
1	-0.0024	-0.0075	-0.0053	-0.0046
	(-0.69)	(-2.39)*	(-2.25)*	(-0.81)
2	-0.0020	0.0056	0.0023	-0.0037
	(-0.91)	(2.20)*	(1.05)	(-1.09)
3	0.0006	0.0012	0.0010	0.0084
	(0.56)	(0.44)	(0.70)	(1.44)
4	-0.0072	-0.0052	-0.0060	-0.0006
	(-1.85)	(-1.52)	(-2.37)*	(-0.10)
5	-0.0022	0.0166	0.0084	0.0031
	(-0.56)	(4.08)**	(2.70)**	(0.92)
6	-0.0038	0.0107	0.0044	0.0091
	(-0.34)	(2.77)**	(1.86)	(2.05)*

Table 5.4 (contd.)

		High Exposure Group	Medium Exposure Group	All Exposed Group	Zero Exposure Group
	7	-0.0060	-0.0020	-0.0037	-0.0022
		(-1.82)	(-0.15)	(-1.31)	(-0.92)
	8	0.0063	0.0108	0.0088	-0.0005
		(2.21)*	(2.87)**	(3.61)**	(-0.11)
	9	0.0034	-0.0033	-0.0004	0.0027
		(0.55)	(-0.65)	(-0.13)	(1.00)
	10	**-0.0130**	**-0.0028**	**-0.0072**	**-0.0005**
		(-2.93)**	**(-1.02)**	**(-2.70)****	**(-0.01)**
Panel B: Cumulative Average Excess Returns					
-1	0	-0.0183	0.0042	-0.0056	0.0174
		(-3.74)**	(1.22)	(-1.55)	(2.82)**
-1	+1	-0.0207	-0.0032	-0.0109	0.0128
		(-3.45)**	(-0.38)	(-2.57)*	(1.84)
-1	+2	-0.0227	0.0024	-0.0086	0.0090
		(-3.44)**	(0.77)	(-1.70)	(1.05)
-1	+3	-0.0221	0.0036	-0.0076	0.0175
		(-2.83)**	(0.88)	(-1.21)	(1.58)
-1	+4	-0.0293	-0.0016	-0.0136	0.0181
		(-3.34)**	(0.18)	(-2.07)*	(1.40)
-1	+5	-0.0315	0.0150	-0.0053	0.0211
		(-3.30)**	(1.71)	(-0.90)	(1.64)
-1	+6	-0.0353	0.0257	-0.0009	0.0302
		(-3.21)**	(2.58)**	(-0.18)	(2.26)*
-1	+7	-0.0413	0.0237	-0.0046	0.0280
		(-3.63)**	(2.38)*	(-0.61)	(1.83)
-1	+8	-0.0350	0.0345	0.0042	0.0284
		(-2.75)**	(3.17)**	(0.57)	(1.78)
-1	+9	-0.0316	0.0312	0.0038	0.0311
		(-2.45)*	(2.82)**	(0.50)	(2.00)*
-1	+10	-0.0446	0.0284	-0.0034	0.0306
		(-3.19)**	(2.41)*	(-0.30)	(1.91)
N		17	22	39	14
Avg res var ('000s)		0.31756	0.28150	0.29722	0.39472
Avg Beta		0.7868	0.4931	0.6211	0.3247

t-statistics in parentheses
* Significant at 5% level
** Significant at 1%
Estimation period 250 days (t = -260 to t = -11)

Table 5.5

Average Excess Returns and Conditional Variance around Mexican Moratorium Event Using GARCH model
(Estimation period t = -260 to t = -11)
(Event Date 820819)

	High Exposure Group		Medium Exposure Group		Zero Exposure Group	
Day	AR(ϵ_t)	Var(h_t) (000)	AR(ϵ_t)	Var(h_t) (000)	AR(ϵ_t)	Var(h_t) (000)
-10	0.0017 (0.37)	0.459	-0.0045 (-1.62)	0.274	0.0031 (0.68)	0.485
-9	-0.0076 (-0.84)	0.421	-0.0005 (0.09)	0.292	-0.0044 (-2.16)*	0.472
-8	0.0048 (1.14)	0.427	-0.0106 (-2.90)**	0.293	-0.0166 (-3.71)**	0.415
-7	0.0020 (-0.06)	0.406	0.0015 (0.55)	0.318	0.0078 (0.99)	0.525
-6	-0.0007 (-0.15)	0.388	-0.0022 (-0.69)	0.272	-0.0018 (-1.72)	0.447
-5	-0.0115 (-1.97)*	0.432	0.0002 (-0.04)	0.268	0.0050 (1.78)	0.394
-4	0.0029 (0.23)	0.430	0.0001 (-0.37)	0.269	-0.0068 (-2.33)*	0.378
-3	0.0182 (3.19)**	0.401	0.0106 (3.09)**	0.288	0.0125 (2.61)**	0.363
-2	0.0192 (3.85)**	0.406	0.0081 (2.47)*	0.328	0.0038 (1.74)	0.363
-1	0.0040 (1.22)	0.509	0.0187 (6.27)**	0.342	0.0108 (2.23)*	0.348
0	**-0.0220 (-5.13)****	**0.501**	**-0.0139 (-4.36)****	**0.342**	**0.0073 (1.70)**	**0.370**
1	-0.0009 (-0.41)	0.506	-0.0051 (-1.13)	0.378	-0.0031 (-2.44)*	0.341
2	-0.0008 (0.09)	0.547	0.0076 (2.80)**	0.407	-0.0024 (-1.48)	0.363
3	0.0005 (0.51)	0.555	0.0012 (0.01)	0.366	0.0086 (0.76)	0.404
4	-0.0062 (-1.64)	0.549	-0.0036 (-1.11)	0.358	0.0017 (-0.50)	0.364
5	-0.0017 (-0.36)	0.518	0.0174 (4.16)**	0.366	0.0038 (2.82)**	0.372

Table 5.5 (contd.)

	High Exposure Group		Medium Exposure Group		Zero Exposure Group	
Day	AR(ϵ_t)	Var(h_t) (000)	AR(ϵ_t)	Var(h_t) (000)	AR(ϵ_t)	Var(h_t) (000)
6	-0.0043	0.505	0.0101	0.395	0.0089	0.372
	(-0.40)		(2.18)*		(2.40)*	
7	-0.0057	0.481	-0.0015	0.346	-0.0018	0.345
	(-1.74)		(-0.11)		(-1.78)	
8	0.0070	0.466	0.0120	0.341	0.0013	0.350
	(1.80)		(3.05)**		(0.06)	
9	0.0020	0.459	-0.0037	0.335	0.0027	0.345
	(0.40)		(-0.58)		(4.56)**	
10	**-0.0123**	**0.441**	**-0.0015**	**0.324**	**0.0004**	**0.450**
	(-2.15)*		**(-0.79)**		**(0.02)**	
N	17		22		14	
Avg. Beta	0.7414		0.4278		0.2869	
Avg. h_t	0.467		0.329		0.394	

t-statistics in parentheses
* Significant at 5% level
** Significant at 1% level

Table 5.6

Average Excess Returns and Conditional Variance around Mexican Moratorium Event Using GARCH Model
(Estimation period t = -252 to t = -3)
(Event Date 820819)

	High Exposure Group		Medium Exposure Group		Zero Exposure Group	
Day	AR(ϵ_t)	Var(h_t) (000)	AR (ϵ_t)	Var(h_t) (000)	AR(ϵ_t)	Var(h_t) (000)
-2	0.0190 (4.48)**	0.373	0.0082 (2.52)*	0.327	0.0040 (1.17)	0.371
-1	0.0039 (1.34)	0.502	0.0187 (6.27)**	0.344	0.0105 (2.22)*	0.355
0	**-0.0221** **(-6.03)****	**0.504**	**-0.0139** **(-4.40)****	**0.339**	**0.0070** **(1.94)**	**0.384**
1	-0.0010 (-0.52)	0.489	-0.0050 (-1.15)	0.371	-0.0031 (-0.72)	0.352
2	-0.0009 (0.03)	0.536	0.0077 (2.88)**	0.395	-0.0025 (-1.04)	0.377
3	0.0005 (0.68)	0.546	0.0012 (0.02)	0.362	0.0082 (1.16)	0.420
4	-0.0063 (-1.81)	0.526	-0.0035 (-1.06)	0.353	0.0015 (0.14)	0.380
5	-0.0018 (-0.39)	0.493	0.0174 (4.20)**	0.363	0.0035 (1.80)	0.383
6	-0.0043 (-0.46)	0.477	0.0101 (2.19)*	0.391	0.0085 (2.07)*	0.383
7	-0.0058 (-1.95)	0.449	-0.0015 (-0.14)	0.344	-0.0021 (-1.00)	0.362
8	0.0069 (2.09)*	0.440	0.0121 (3.05)**	0.339	0.0011 (0.08)	0.369
9	0.0030 (0.43)	0.440	-0.0037 (-0.56)	0.336	0.0023 (0.82)	0.368
10	**-0.0124** **(-2.52)***	**0.420**	**-0.0015** **(-0.85)**	**0.322**	**0.0002** **(0.05)**	**0.476**
N	17		22		14	

t-statistics in parentheses
* Significant at 5% level
** Significant at 1% level

Table 5.7

Excess Returns and Cumulative Excess Returns around Mexican Moratorium Event Using OLS Model (according to capital adequacy) (Event Date 820819)

Panel A: Daily Average Excess Returns

Day	Capital Deficient	Capital Sufficient	All Exposed	Zero Exposure
-10	0.0004	-0.0024	-0.0015	0.0031
	(0.11)	(-1.02)	(-0.77)	(0.50)
-9	-0.0088	-0.0001	-0.0030	-0.0043
	(-1.40)	(0.08)	(-0.74)	(-1.16)
-8	0.0038	-0.0074	-0.0037	-0.0166
	(1.47)	(-2.44)*	(-1.15)	(-3.00)**
-7	0.0058	-0.0003	0.0017	0.0076
	(0.75)	(-0.08)	(0.37)	(1.38)
-6	-0.0011	-0.0017	-0.0015	-0.0020
	(0.13)	(-0.64)	(-0.45)	(-0.64)
-5	-0.0133	-0.0006	-0.0049	0.0048
	(-3.39)**	(-0.22)	(-2.14)*	(1.03)
-4	0.0082	-0.0033	-0.0005	-0.0075
	(1.57)	(-1.00)	(0.09)	(-1.25)
-3	0.0139	0.0135	0.0136	0.0121
	(2.38)*	(4.25)**	(4.84)**	(2.34)*
-2	0.0114	0.0098	0.0103	0.0019
	(2.14)*	(3.24)**	(3.88)**	(-0.18)
-1	-0.0026	0.0195	0.0121	0.0105
	(-0.28)	(6.93)**	(5.50)**	(2.06)*
0	**-0.0264**	**-0.0134**	**-0.0177**	**0.0069**
	(-6.99)**	**(-4.48)****	**(-7.70)****	**(1.93)**
1	0.0052	-0.0105	-0.0053	-0.0046
	(0.58)	(-3.16)**	(-2.25)*	(-0.81)
2	-0.0020	0.0044	0.0023	-0.0037
	(-0.43)	(1.59)	(1.05)	(-1.09)
3	-0.0018	0.0023	0.0010	0.0084
	(-0.65)	(1.31)	(0.70)	(1.44)
4	-0.0043	-0.0069	-0.0060	0.0006
	(-1.11)	(-2.12)*	(-2.37)*	(-0.10)
5	0.0011	0.0120	0.0084	0.0031
	(-0.16)	(3.41)**	(2.70)**	(0.92)

Table 5.7 (contd.)

Day	Capital Deficient	Capital Sufficient	All Exposed	Zero Exposure
6	-0.0082	0.0106	0.0044	0.0091
	(-1.30)	(3.20)**	(1.86)	(2.05)*
7	-0.0103	-0.0004	-0.0037	-0.0022
	(-2.10)*	(-0.13)	(-1.31)	(-0.92)
8	0.0003	0.0131	0.0088	0.0004
	(0.34)	(4.19)**	(3.61)**	(0.16)
9	0.0048	-0.0030	-0.0004	0.0027
	(0.89)	(-0.78)	(-0.13)	(1.00)
10	**-0.0174**	**-0.0021**	**-0.0072**	**-0.0005**
	(-3.49)**	**(-0.84)**	**(-2.70)****	**(-0.01)**
11	-0.0208	-0.0125	-0.0153	0.0000
	(-4.54)**	(-3.57)**	(-5.54)**	(0.39)
12	-0.0084	-0.0056	-0.0065	0.0057
	(-2.12)*	(-1.65)	(-2.56)*	(1.30)
13	0.0068	-0.0027	0.0005	-0.0050
	(2.40)*	(-1.00)	(0.57)	(-1.06)
14	0.0093	0.0011	0.0038	0.0006
	(1.20)	(0.32)	(0.96)	(0.71)
15	-0.0001	0.0001	0.0000	-0.0091
	(-0.51)	(-0.26)	(-0.51)	(-1.68)
16	-0.0010	0.0056	0.0034	0.0014
	(-0.04)	(1.62)	(1.30)	(0.30)
17	0.0164	0.0061	0.0095	-0.0056
	(4.08)**	(2.29)*	(4.22)**	(-0.83)
18	0.0146	0.0147	0.0146	-0.0039
	(3.51)**	(4.98)**	(6.09)**	(-0.74)
19	0.0126	0.0154	0.0145	0.0046
	(2.85)**	(5.48)**	(6.12)**	(1.09)
20	0.0101	-0.0008	0.0028	0.0065
	(1.61)	(-0.28)	(0.71)	(0.68)

Table 5.7 (contd.)

Panel B: Cumulative Average Excess Returns

Cumulation Period	Capital Deficient	Capital Sufficient	All Exposed	Zero Exposure
-1 0	-0.0291	0.0062	-0.0056	0.0174
	(-5.14)**	(1.73)	(-1.55)	(2.82)**
-1 +1	-0.0239	-0.0043	-0.0109	0.0128
	(-3.86)**	(-0.41)	(-2.56)*	(1.84)
-1 +2	-0.0259	0.0001	-0.0086	0.0090
	(-3.56)**	(0.44)	(-1.70)	(1.05)
-1 +3	-0.0277	0.0025	-0.0076	0.0175
	(-3.47)**	(0.98)	(-1.21)	(1.58)
-1 +4	-0.0320	-0.0045	-0.0136	0.0181
	(-3.62)**	(0.03)	(-2.07)*	(1.40)
-1 +5	-0.0309	0.0075	-0.0053	0.0211
	(-3.41)**	(1.32)	(-0.90)	(1.64)
-1 +6	-0.0391	0.0182	-0.0009	0.0302
	(-3.65)**	(2.36)*	(-0.18)	(2.26)*
-1 +7	-0.0493	0.0177	-0.0046	0.0280
	(-4.14)**	(2.18)*	(-0.61)	(1.83)
-1 +8	-0.0490	0.0308	0.0042	0.0284
	(-3.83)**	(3.40)**	(0.57)	(1.78)
-1 +9	-0.0442	0.0279	0.0038	0.0311
	(-3.38)**	(3.00)**	(0.50)	(2.00)*
-1 +10	-0.0617	0.0257	-0.0034	0.0306
	(-4.24)**	(2.63)**	(-0.30)	(1.91)
9 +10	-0.0126	-0.0051	-0.0076	0.0022
	(-1.84)	(-1.14)	(-2.00)*	(0.70)
N	13	26	39	14
Avg res var ('000s)	0.39688	0.24739	0.29722	0.39472
Avg Beta	0.7951	0.5341	0.6211	0.3247

t-statistics in parentheses
* Significant at 5% level
** Significant at 1% level

Table 5.8

Excess Returns and Cumulative Excess Returns around Bolivian Moratorium Event Using OLS Model (according to exposure level) (Event Date 840531)

Day		High Exposure Group	Medium Exposure Group	All Exposed Banks	Zero Exposure Group
Panel A: Daily Average Excess Returns					
-3		0.0165	-0.0026	0.0052	-0.0024
		(4.41)**	(-1.02)	(2.04)*	(-0.61)
-2		-0.0053	-0.0006	-0.0025	0.0002
		(-1.03)	(-0.15)	(-0.78)	(0.03)
-1		-0.0097	-0.0021	-0.0052	-0.0029
		(-2.90)**	(-0.53)	(-2.27)*	(-0.45)
0		**-0.0122**	**-0.0017**	**-0.0060**	**-0.0023**
		(-3.64)**	**(-0.52)**	**(-2.73)****	**(-0.52)**
1		-0.0101	-0.0029	-0.0059	-0.0003
		(-2.53)*	(-0.88)	(-2.30)*	(-0.14)
2		0.0088	0.0026	0.0051	-0.0001
		(2.62)**	(1.18)	(2.58)*	(0.15)
3		-0.0052	-0.0006	-0.0025	-0.0002
		(-1.37)	(0.02)	(-0.86)	(-0.11)
Panel B: Cumulative Average Excess Returns					
-1	0	-0.0218	-0.0038	-0.0112	-0.0052
		(-4.62)**	(-0.74)	(-3.53)**	(-0.68)
-1	+1	-0.0319	-0.0067	-0.0171	-0.0055
		(-5.24)**	(-1.12)	(-4.21)**	(-0.64)
-1	+2	-0.0232	-0.0041	-0.0119	-0.0056
		(-3.22)**	(-0.38)	(-2.35)*	(-0.48)
-1	+3	-0.0284	-0.0047	-0.0144	-0.0059
		(-3.50)**	(-0.33)	(-2.49)*	(-0.48)
N		16	23	39	13
Avg res var ('000s)		0.23191	0.23943	0.23634	0.27381
Avg Beta		0.8280	0.4931	0.6305	0.3653

t-statistics in parentheses
* Significant at 5% level
** Significant at 1% level

Table 5.9

Excess Returns and Cumulative Excess Returns around Bolivian Moratorium Event Using OLS Model (according to capital adequacy) (Event Date 840531)

Day		Capital Deficient	Capital Sufficient	All Exposed	Zero Exposure
		Panel A: Daily Average Excess Returns			
-3		0.0079	0.0045	0.0052	-0.0024
		(1.61)	(1.47)	(2.04)*	(-0.61)
-2		-0.0050	-0.0019	-0.0025	0.0002
		(-0.99)	(-0.37)	(-0.78)	(0.03)
-1		-0.0206	-0.0013	-0.0052	-0.0029
		(-4.18)**	(-0.42)	(-2.27)*	(-0.45)
0		**-0.0194**	**-0.0025**	**-0.0060**	**-0.0023**
		(-3.97)**	**(-1.04)**	**(-2.73)****	**(-0.52)**
1		-0.0021	-0.0068	-0.0059	-0.0003
		(-0.33)	(-2.41)*	(-2.30)*	(-0.14)
2		0.0183	0.0018	0.0051	-0.0001
		(3.69)**	(1.02)	(2.58)*	(0.15)
3		-0.0048	-0.0019	-0.0025	-0.0002
		(-0.98)	(-0.47)	(-0.86)	(-0.11)
		Panel B: Cumulative Average Excess Returns			
-1	0	-0.0400	-0.0038	-0.0112	-0.0052
		(-5.77)**	(-1.03)	(-3.53)**	(-0.68)
-1	+1	-0.0421	-0.0106	-0.0171	-0.0055
		(-4.90)**	(-2.23)*	(-4.21)**	(-0.64)
-1	+2	-0.0238	-0.0088	-0.0119	-0.0056
		(-2.40)*	(-1.42)	(-2.35)*	(-0.48)
-1	+3	-0.0286	-0.0108	-0.0144	-0.0059
		(-2.58)**	(-1.48)	(-2.49)*	(-0.48)
N		8	31	39	13
Avg res var ('000s)		0.18423	0.24979	0.23634	0.27381
Avg Beta		0.9000	0.5611	0.6305	0.3653

t-statistics in parentheses
* Significant at 5% level
** Significant at 1% level

Table 5.10

Excess Returns and Cumulative Excess Returns around Brazilian Moratorium Event Using OLS Model (Event Date 870223)

Panel A: Daily Average Excess Returns				
Day	High Exposure Group	Medium Exposure Group	All Exposed Group	Zero Exposure Group
-10	0.0057	0.0061	0.0059	-0.0056
	(0.91)	(1.27)	(1.56)	(-0.83)
-9	0.0005	0.0041	0.0026	0.0002
	(0.28)	(1.13)	(1.04)	(-0.54)
-8	-0.0065	0.0053	0.0002	0.0027
	(-1.60)	(1.38)	(-0.01)	(0.83)
-7	-0.0071	-0.0008	-0.0035	-0.0063
	(-1.67)	(-0.17)	(-1.22)	(-1.28)
-6	0.0030	0.0027	0.0028	0.0062
	(0.38)	(0.76)	(0.83)	(1.24)
-5	0.0040	0.0001	0.0017	-0.0012
	(0.63)	(0.28)	(0.62)	(-0.42)
-4	-0.0136	-0.0068	-0.0097	0.0048
	(-2.75)**	(-1.77)	(-3.13)**	(1.09)
-3	0.0090	0.0125	0.0110	-0.0018
	(2.99)**	(4.08)**	(5.04)**	(-0.44)
-2	0.0096	0.0027	0.0057	0.0026
	(2.62)**	(1.63)	(2.94)**	(0.59)
-1	-0.0091	0.0028	-0.0023	-0.0005
	(-2.35)*	(0.55)	(-1.12)	(0.06)
0	**-0.0198**	**-0.0048**	**-0.0112**	**-0.0080**
	(-5.23)**	**(-1.61)**	**(-4.64)****	**(-1.44)**
1	0.0029	0.0006	0.0016	-0.0009
	(0.15)	(0.18)	(-0.03)	(0.15)
2	-0.0100	-0.0010	-0.0049	0.0093
	(-3.62)**	(-0.25)	(-2.56)*	(1.82)
3	-0.0075	0.0004	-0.0030	0.0053
	(-1.37)	(0.25)	(-0.71)	(1.02)
4	0.0083	0.0018	0.0046	0.0026
	(3.00)**	(0.77)	(2.54)*	(0.25)
5	0.0063	0.0069	0.0066	0.0126
	(1.32)	(2.11)*	(2.46)*	(2.83)**
6	0.0005	-0.0021	-0.0010	0.0096
	(-0.31)	(-0.44)	(-0.53)	(1.92)
7	-0.0100	-0.0100	-0.0100	0.0016
	(-2.63)**	(-2.76)**	(-3.81)**	(0.25)

Table 5.10 (contd.)

Day		High Exposure Group	Medium Exposure Group	All Exposed Group	Zero Exposure Group
	8	0.0049	-0.0026	0.0006	0.0012
		(1.19)	(-1.16)	(-0.09)	(0.22)
	9	0.0009	0.0041	0.0027	-0.0071
		(-1.04)	(0.69)	(-0.16)	(-1.42)
	10	-0.0001	0.0035	0.0020	0.0031
		(-0.44)	(1.02)	(0.49)	(0.31)
Panel B: Cumulative Average Excess Returns					
-1	0	-0.0288	-0.0020	-0.0135	-0.0085
		(-5.36)**	(-0.75)	(-4.08)**	(-0.97)
-1	+1	-0.0259	-0.0015	-0.0120	-0.0094
		(-4.29)**	(-0.71)	(-3.35)**	(-0.71)
-1	+2	-0.0360	-0.0025	-0.0168	-0.0001
		(-5.52)**	(-0.74)	(-4.18)**	(0.30)
-1	+3	-0.0435	-0.0021	-0.0198	0.0053
		(-5.55)**	(-0.55)	(-4.05)**	(0.72)
-1	+4	-0.0352	-0.0002	-0.0152	0.0079
		(-3.85)**	(-0.19)	(-2.66)**	(0.76)
-1	+5	-0.0289	0.0067	-0.0086	0.0205
		(-3.06)**	(0.62)	(-1.53)	(1.77)
-1	+6	-0.0284	0.0046	-0.0096	0.0301
		(-2.97)**	(0.43)	(-1.62)	(2.34)*
-1	+7	-0.0384	-0.0054	-0.0196	0.0317
		(-3.68)**	(-0.52)	(-2.80)**	(2.29)*
-1	+8	-0.0335	-0.0080	-0.0189	0.0328
		(-3.11)**	(-0.86)	(-2.69)**	(2.24)*
-1	+9	-0.0326	-0.0040	-0.0162	0.0257
		(-3.28)**	(-0.61)	(-2.61)**	(1.71)
-1	+10	-0.0326	-0.0004	-0.0142	0.0288
		(-3.27)**	(-0.29)	(-2.36)*	(1.73)
N		15	20	35	13
Avg res var ('000s)		0.36276	0.31057	0.33294	0.33081
Avg Beta		0.9498	0.7522	0.8369	0.5756

t-statistics in parentheses
* Significant at 5% level
** Significant at 1% level
Estimation period 250 days (t = =260 to t = -11)

Table 5.11

Average Excess Returns and Conditional Variance around Brazilian Moratorium Event Using GARCH Model (Event Date 870223)

	High Exposure Group		Medium Exposure Group		Zero Exposure Group	
Day	AR(ϵ_t)	VAR(h_t) (000)	AR(ϵ_t)	VAR(h_t) (000)	AR(ϵ_t)	VAR(h_t) (000)
-10	0.0062	0.286	0.0064	0.338	-0.0051	0.302
	(1.10)		(1.29)		(-0.77)	
-9	0.0007	0.275	0.0040	0.350	0.0003	0.300
	(0.32)		(1.11)		(-0.74)	
-8	-0.0065	0.252	0.0048	0.333	0.0024	0.352
	(-1.97)*		(1.22)		(0.98)	
-7	-0.0060	0.284	0.0007	0.333	-0.0049	0.342
	(-1.50)		(0.34)		(-1.29)	
-6	0.0033	0.287	0.0027	0.331	0.0063	0.331
	(0.53)		(0.69)		(1.48)	
-5	0.0054	0.274	0.0020	0.332	0.0007	0.334
	(1.11)		(0.88)		(-0.06)	
-4	-0.0119	0.267	-0.0043	0.334	0.0071	0.310
	(-2.72)**		(-1.24)		(1.59)	
-3	0.0096	0.283	0.0131	0.327	-0.0011	0.302
	(3.27)**		(3.89)**		(-0.75)	
-2	0.0103	0.327	0.0035	0.518	0.0033	0.311
	(2.56)*		(1.61)		(0.76)	
-1	-0.0084	0.343	0.0034	0.467	0.0001	0.319
	(-2.28)*		(0.85)		(0.03)	
0	**-0.0197**	**0.287**	**-0.0052**	**0.433**	**-0.0082**	**0.327**
	(-5.34)**		**(-1.40)**		**(-1.53)**	
1	0.0036	0.394	0.0014	0.460	-0.0001	0.345
	(0.65)		(0.12)		(0.14)	
2	-0.0092	0.293	0.0001	0.398	0.0103	0.353
	(-3.35)**		(-0.15)		(1.91)	
3	-0.0070	0.353	0.0007	0.376	0.0057	0.357
	(-1.39)		(0.16)		(1.02)	
4	0.0091	0.288	0.0029	0.367	0.0036	0.339
	(3.21)**		(1.00)		(0.65)	
5	0.0068	0.299	0.0073	0.379	0.0131	0.348
	(1.54)		(2.02)*		(2.91)**	

Table 5.11 (contd.)

	High Exposure Group		Medium Exposure Group		Zero Exposure Group	
Day	AR(ϵ_t)	VAR(h_t) (000)	AR(ϵ_t)	VAR(h_t) (000)	AR(ϵ_t)	VAR(h_t) (000)
6	0.0013 (-0.07)	0.292	-0.0012 (-0.29)	0.345	0.0105 (2.12)*	0.332
7	-0.0085 (-2.49)*	0.269	-0.0079 (-2.01)*	0.344	0.0035 (0.58)	0.313
8	0.0059 (1.23)	0.291	-0.0013 (-1.04)	0.345	0.0024 (0.39)	0.309
9	0.0015 (-0.73)	0.365	0.0047 (0.96)	0.349	-0.0064 (-1.28)	0.307
10	0.0002 (-0.17)	0.360	0.0034 (0.77)	0.352	0.0031 (0.40)	0.300
N	15		20		13	
Avg. beta	0.8927		0.6417		0.4825	
Avg. h_t	0.303		0.372		0.325	

t-statistics in parentheses
* Significant at 5% level
** Significant at 1% level
Estimation period 250 days (t = -260 to t = -11)

Table 5.12

Excess Returns and Cumulative Excess Returns around Citicorp Loan-Loss-Provision Event Using OLS Model (Event Date 870519)

Day		High Exposure Group	Medium Exposure Group	Zero Exposure Group	Citicorp
Panel A: Daily Average Excess Returns					
-3		0.0016	0.0033	0.0017	-0.0019
		(0.49)	(-0.14)	(0.23)	(-0.14)
-2		-0.0008	0.0046	0.0022	-0.0201
		(-0.39)	(0.61)	(0.33)	(-1.48)
-1		0.0018	-0.0018	-0.0152	0.0228
		(0.29)	(-1.16)	(-2.95)**	(1.69)
0		**-0.0039**	**-0.0030**	**-0.0012**	**-0.0108**
		(-1.25)	**(-0.82)**	**(-0.06)**	**(-0.79)**
1		-0.0061	-0.0019	-0.0070	0.0557
		(-1.53)	(-0.09)	(-1.61)	(4.13)**
2		0.0129	0.0004	0.0027	0.0463
		(4.04)**	(0.62)	(0.86)	(3.43)**
3		-0.0026	0.0036	-0.0001	-0.0131
		(0.05)	(1.19)	(-0.23)	(-0.97)
Panel B: Cumulative Average Excess Returns					
-1	0	-0.0022	-0.0048	-0.0164	0.0120
		(-0.68)	(-1.40)	(-2.13)*	(0.63)
-1	+1	-0.0082	-0.0067	-0.0233	0.0676
		(-1.44)	(-1.09)	(-2.67)**	(2.90)**
-1	+2	0.0047	-0.0063	-0.0207	0.1140
		(0.78)	(-0.63)	(-1.88)	(4.23)**
-1	+3	0.0021	-0.0027	-0.0208	0.1009
		(0.72)	(-0.04)	(-1.78)	(3.35)**
N		15	22	12	1
Avg res var ('000s)		0.27670	0.47014	0.28717	0.18225
Avg Beta		0.6830	0.7636	0.5820	0.9288

t-statistics in parentheses
* Significant at 5% level
** Significant at 1% level

Table 5.13

Excess Returns and Cumulative Excess Returns around Mexican Debt-Rescheduling Event Using OLS Model (Event Date 860930)

Day		High Exposure Group	Medium Exposure Group	All Exposed Group	Zero Exposure Group
Panel A: Daily Average Excess Returns					
-3		0.0046	0.0144	0.0102	0.0014
		(0.60)	(3.31)**	(2.89)**	(0.15)
-2		0.0009	0.0007	0.0008	-0.0024
		(0.31)	(-0.40)	(-0.10)	(-0.54)
-1		0.0017	-0.0066	-0.0030	-0.0018
		(0.39)	(-2.16)*	(-1.38)	(-0.51)
0		**-0.0112**	**-0.0062**	**-0.0083**	**0.0001**
		(-2.51)*	**(-1.81)**	**(-3.01)****	**(0.14)**
1		-0.0027	-0.0108	-0.0073	0.0096
		(-0.49)	(-2.75)**	(-2.40)*	(1.72)
2		-0.0049	-0.0036	-0.0042	0.0046
		(-1.45)	(-1.18)	(-1.84)	(0.68)
3		0.0074	-0.0053	0.0001	-0.0056
		(1.80)	(-1.10)	(0.35)	(-0.75)
Panel B: Cumulative Average Excess Returns					
-1	0	-0.0095	-0.0128	-0.0114	-0.0016
		(-1.50)	(-2.81)**	(-3.10)**	(-0.26)
-1	+1	-0.0122	-0.0236	-0.0187	0.0080
		(-1.51)	(-3.88)**	(-3.92)**	(0.78)
-1	+2	-0.0171	-0.0272	-0.0229	0.0126
		(-2.03)*	(-3.95)**	(-4.32)**	(1.02)
-1	+3	-0.0097	-0.0325	-0.0227	0.0070
		(-1.01)	(-4.03)**	(-3.70)**	(0.57)
N		15	20	35	13
Avg res var('000s)		0.32029	0.30020	0.30881	0.31494
Avg Beta		1.0792	0.7938	0.9161	0.5874

t-statistics in parentheses
* Significant at 5% level
** Significant at 1% level

Table 5.14

Excess Returns and Cumulative Excess Returns around Falkland War Event Using OLS Model (Event Date 820402)

Day	High Exposure Group	Medium Exposure Group	All Exposed Group	Zero Exposure Group
	Panel A: Daily Average Excess Returns			
-3	-0.0016	-0.0022	-0.0019	-0.0005
	(-0.37)	(-0.59)	(-0.68)	(-0.71)
-2	0.0003	0.0009	0.0006	0.0020
	(0.41)	(0.20)	(0.43)	(0.45)
-1	-0.0039	-0.0025	-0.0032	-0.0025
	(-1.04)	(-0.79)	(-1.29)	(-0.03)
0	**0.0053**	**0.0015**	**0.0033**	**-0.0028**
	(1.58)	**(0.50)**	**(1.45)**	**(-0.63)**
1	0.0028	-0.0054	-0.0015	-0.0040
	(0.28)	(-1.31)	(-0.76)	(-0.88)
2	0.0006	-0.0011	-0.0003	-0.0029
	(-0.05)	(-0.38)	(-0.31)	(-1.16)
3	0.0027	-0.0006	0.0010	0.0041
	(0.28)	(-0.36)	(-0.07)	(0.95)
	Panel B: Cumulative Average Excess Returns			
-1 0	0.0013	-0.0010	0.0001	-0.0052
	(0.38)	(-0.21)	(0.11)	(-0.47)
-1 +1	0.0042	-0.0064	-0.0014	-0.0093
	(0.47)	(-0.92)	(-0.35)	(-0.89)
-1 +2	0.0048	-0.0075	-0.0017	-0.0121
	(0.38)	(-0.99)	(-0.46)	(-1.35)
-1 +3	0.0075	-0.0081	-0.0007	-0.0080
	(0.47)	(-1.05)	(-0.44)	(-0.78)
N	17	19	36	14
Avg res var ('000s)	0.27649	0.22907	0.25146	0.39729
Avg Beta	0.7563	0.5344	0.6392	0.3644

t-statistics in parentheses
* Significant at 5% level
** Significant at 1% level

Table 5.15

Excess Returns and Cumulative Excess Returns around Falkland War Event Using OLS Model (Event Date 820505)

Day	High Exposure Group	Medium Exposure Group	All Exposed Banks	Zero Exposure Group
Panel A: Daily Average Excess Returns				
-3	0.0058	0.0055	0.0056	-0.0034
	(1.12)	(1.61)	(1.94)	(-0.75)
-2	-0.0070	-0.0078	-0.0074	-0.0063
	(-2.00)*	(-1.93)	(-2.78)**	(-1.11)
-1	-0.0083	-0.0024	-0.0052	0.0019
	(-2.24)*	(-0.71)	(-2.06)*	(0.43)
0	**-0.0102**	**-0.0016**	**-0.0057**	**0.0051**
	(-2.48)*	**(-0.53)**	**(-2.07)***	**(0.61)**
1	0.0064	-0.0013	0.0023	-0.0017
	(1.06)	(-0.25)	(0.54)	(-0.14)
2	-0.0045	-0.0045	-0.0045	-0.0028
	(-1.10)	(-1.56)	(-1.89)	(-0.63)
3	0.0045	0.0069	0.0058	0.0019
	(0.36)	(1.88)	(1.61)	(0.57)
Panel B: Cumulative Average Excess Returns				
-1 0	-0.0184	-0.0041	-0.0108	0.0070
	(-3.34)**	(-0.88)	(-2.94)**	(0.74)
-1 +1	-0.0121	-0.0054	-0.0085	0.0053
	(-2.12)*	(-0.87)	(-2.08)*	(0.52)
-1 +2	-0.0165	-0.0099	-0.0130	0.0025
	(-2.38)*	(-1.53)	(-2.75)**	(0.14)
-1 +3	-0.0120	-0.0030	-0.0073	0.0044
	-(1.96)	(-0.53)	(-1.74)	(0.38)
N	17	19	36	14
Avg res var ('000s)	0.27520	0.23181	0.25230	0.40164
Avg Beta	0.7528	0.5389	0.6399	0.3506

t-statistics in parentheses
* Significant at 5% level
** Significant at 1% level

Table 5.16

Average Excess Returns around Legislative Actions
Using OLS Model

Day		High Exposure Group	Medium Exposure Group	All Exposed Group	Zero Exposure Group
		Average Excess Returns			
-3		0.0068	0.0026	0.0044	-0.0067
		(1.36)	(0.72)	(1.43)	(-1.27)
-2		0.0271	0.0235	0.0250	0.0024
		(5.74)**	(5.60)**	(7.99)**	(0.24)
-1		0.0364	0.0149	0.0240	-0.0030
		(7.74)**	(4.06)**	(8.13)**	(-0.48)
(a) **0**	**7 March 1983**	**0.0054**	**0.0075**	**0.0066**	**0.0097**
		(1.34)	**(1.83)**	**(2.26)***	**(1.92)**
+1		-0.0107	0.0002	-0.0044	0.0013
		(-2.20)*	(0.06)	(-1.39)	(-0.03)
+2		-0.0067	-0.0008	-0.0033	-0.0013
		(-1.22)	(-0.45)	(-1.14)	(-0.33)
+3		0.0012	0.0057	0.0038	0.0102
		(-0.03)	(1.47)	(1.10)	(1.97)*
-3		-0.0037	-0.0042	-0.0040	-0.0007
		(-0.91)	(-1.37)	(-1.63)	(-0.19)
-2		-0.0059	-0.0044	-0.0050	-0.0027
		(-1.23)	(-1.53)	(-1.95)	(-1.28)
-1		0.0001	-0.0052	-0.0030	0.0055
		(-0.03)	(-1.20)	(-0.93)	(1.23)
(b) **0**	**5 May 1983**	**-0.0067**	**-0.0003**	**-0.0030**	**0.0034**
		(-1.17)	**(-0.05)**	**(-0.80)**	**(0.91)**
+1		0.0038	0.0028	0.0032	0.0024
		(0.87)	(0.44)	(0.90)	(0.41)
+2		0.0013	-0.0001	0.0005	0.0079
		(0.25)	(0.16)	(0.28)	(1.98)*
(c) +3	10 May 1983	-0.0021	-0.0018	-0.0019	0.0078
		(-0.3403)	(-0.23)	(-0.40)	(2.13)*
-3		-0.0041	0.0056	0.0015	-0.0049
		(-0.99)	(1.60)	(0.56)	(-0.60)
-2		-0.0050	0.0054	0.0010	-0.0020
		(-1.09)	(1.54)	(0.46)	(-0.51)

Table 5.16 (contd.)

Day			Average Excess Returns			
			High Exposure Group	Medium Exposure Group	All Exposed Group	Zero Exposure Group
	-1		0.0015 (0.50)	-0.0031 (-0.71)	-0.0011 (-0.22)	-0.0043 (-0.84)
(d)	**0**	**8 June 1983**	**-0.0140** **(-2.80)****	**-0.0052** **(-2.08)***	**-0.0089** **(-3.40)****	**-0.0113** **(-2.13)***
	+1		-0.0045 (-1.27)	-0.0077 (-1.97)*	-0.0063 (-2.32)*	-0.0029 (-0.94)
	+2		-0.0010 (-0.32)	0.0006 (0.17)	-0.0001 (-0.08)	-0.0046 (-0.60)
	+3		-0.0072 (-1.50)	-0.0036 (-0.87)	-0.0052 (-1.64)	-0.0015 (-0.53)
	-3		-0.0060 (-1.43)	-0.0018 (-0.23)	-0.0035 (-1.08)	-0.0067 (-1.39)
	-2		0.0036 (0.68)	-0.0071 (-1.95)	-0.0028 (-1.10)	-0.0042 (-0.88)
	-1		-0.0033 (-0.61)	0.0029 (0.92)	0.0004 (0.33)	-0.0048 (-1.14)
(e)	**0**	**3 Aug. 1983**	**-0.0006** **(0.10)**	**0.0026** **(0.28)**	**0.0013** **(0.28)**	**-0.0057** **(-1.28)**
	+1		-0.0025 (-0.20)	-0.0030 (-0.53)	-0.0028 (-0.53)	-0.0094 (-2.32)*
	+2		-0.0001 (-0.25)	-0.0023 (-0.39)	-0.0014 (-0.46)	-0.0020 (-0.70)
	+3		0.0042 (0.84)	-0.0031 (-1.15)	-0.0002 (-0.36)	-0.0157 (-3.64)**
	-3		0.0062 (1.70)	0.0062 (2.28)*	0.0062 (2.84)**	0.0048 (1.06)
	-2		0.0010 (0.12)	-0.0023 (-0.58)	-0.0010 (-0.37)	0.0055 (0.99)
	-1		0.0001 (-0.19)	0.0016 (0.60)	0.0010 (0.34)	-0.0067 (-1.40)
(f)	**0**	**17 Nov. 1983**	**-0.0016** **(-0.40)**	**0.0029** **(1.03)**	**0.0011** **(0.54)**	**0.0259** **(6.92)****
	+1	18 Nov. 1983	0.0038 (0.95)	0.0015 (0.75)	0.0024 (1.18)	0.0012 (0.06)

Table 5.16 (contd.)

Day	High Exposure Group	Medium Exposure Group	All Exposed Group	Zero Exposure Group
	Average Excess Returns			
+2	-0.0053	0.0037	0.0001	0.0029
	(-1.21)	(1.27)	(0.21)	(0.78)
+3	0.0152	0.0040	0.0085	0.0009
	(3.81)**	(1.15)	(3.30)**	(0.18)
-3	0.0003	-0.0013	-0.0006	-0.0009
	(0.25)	(-0.43)	(-0.17)	(-0.18)
-2	0.0044	0.0039	0.0041	0.0010
	(0.87)	(1.19)	(1.47)	(0.36)
-1	0.0028	-0.0005	0.0008	-0.0015
	(0.67)	(-0.19)	(0.27)	(-0.38)
(h) **0 30 Nov. 1983**	**0.0074**	**0.0005**	**0.0033**	**0.0016**
	(1.85)	**(0.35)**	**(1.44)**	**(0.12)**
+1	0.0008	-0.0040	-0.0021	-0.0091
	(0.15)	(-1.23)	(-0.86)	(-2.10)*
+2	-0.0045	0.0004	-0.0016	0.0032
	(-1.20)	(0.14)	(-0.65)	(0.51)
+3	-0.0044	-0.0048	-0.0046	-0.0020
	(-1.20)	(-1.50)	(-1.92)	(-0.27)
N	16	24	40	15
Avg res. var. ('000s)	0.29864	0.32515	0.31455	0.33887
Avg Beta	0.8802	0.5052	0.6552	0.3384

t-statistics in parentheses
* Significant at 5% level
** Significant at 1% level

Table 5.17

Excess Returns and Cumulative Excess Returns around Cartagena Declaration Event Using OLS Model (Event Date 840621)

Day	High Exposure Group	Medium Exposure Group	All Exposed Group	Zero Exposure Group
Panel A: Daily Average Excess Returns				
-3	0.0076	-0.0023	0.0017	-0.0118
	(2.12)*	(-0.62)	(0.87)	(-2.74)**
-2	0.0055	0.0016	0.0032	0.0045
	(1.46)	(0.80)	(1.54)	(0.90)
-1	-0.0023	-0.0033	-0.0029	-0.0054
	(-0.54)	(-0.94)	(-1.07)	(-1.36)
0	**0.0060**	**0.0073**	**0.0068**	**0.0014**
	(1.92)	**(2.41)***	**(3.08)****	**(0.45)**
1	-0.0093	-0.0020	-0.0050	0.0017
	(-2.75)**	(-0.63)	(-2.26)*	(0.38)
2	0.0022	0.0019	0.0020	0.0042
	(0.34)	(0.39)	(0.52)	(0.74)
3	0.0020	-0.0031	-0.0010	0.0024
	(0.75)	(-1.14)	(-0.39)	(0.61)
Panel B: Cumulative Average Excess Returns				
-1 0	0.0037	0.0040	0.0039	-0.0040
	(0.98)	(1.03)	(1.42)	(-0.64)
-1 +1	-0.0056	0.0021	-0.0011	-0.0023
	(-0.79)	(0.48)	(-0.14)	(-0.30)
-1 +2	-0.0034	0.0040	0.0009	0.0018
	(-0.51)	(0.61)	(0.13)	(0.11)
-1 +3	-0.0014	0.0008	-0.0001	0.0043
	(-0.12)	(0.04)	(-0.05)	(0.37)
N	15	22	37	13
Avg res var ('000s)	0.22966	0.24577	0.23924	0.26954
Avg Beta	0.8599	0.5207	0.6582	0.3556

t-statistics in parentheses
* Significant at 5% level
** Significant at 1% level

Table 5.18

Excess Returns and Cumulative Excess Returns around Peru's Declaration Event Using OLS Model (Event Date 850729)

Day	High Exposure Group	Medium Exposure Group	All Exposed Banks	Zero Exposure Group
Panel A: Daily Average Excess Returns				
-3	-0.0052	-0.0097	-0.0078	-0.0092
	(-1.79)	(-3.84)**	(-4.10)**	(-3.09)**
-2	-0.0001	-0.0087	-0.0053	-0.0085
	(-0.19)	(-3.14)**	(-2.55)*	(-2.76)**
-1	0.0021	-0.0065	-0.0030	-0.0049
	(-0.09)	(-2.19)*	(-1.75)	(-1.39)
0	**-0.0013**	**-0.0056**	**-0.0039**	**-0.0060**
	(-0.02)	**(-1.59)**	**(-1.24)**	**(-1.74)**
1	-0.0069	-0.0014	-0.0036	-0.0071
	(-1.47)	(-0.67)	(-1.46)	(-2.17)*
2	0.0018	0.0030	0.0025	0.0002
	(0.25)	(1.17)	(1.06)	(0.08)
3	-0.0061	0.0024	-0.0010	-0.0001
	(-1.58)	(0.82)	(-0.37)	(0.06)
Panel B: Cumulative Average Excess Returns				
-1 0	0.0007	-0.0121	-0.0069	-0.0110
	(-0.08)	(-2.68)**	(-2.12)*	(-2.21)*
-1 +1	-0.0062	-0.0135	-0.0105	-0.0181
	(-0.92)	(-2.56)*	(-2.56)*	(-3.06)**
-1 +2	-0.0043	-0.0105	-0.0080	-0.0178
	(-0.67)	(-1.64)	(-1.69)	(-2.61)**
-1 +3	-0.0104	-0.0080	-0.0090	-0.0179
	(-1.31)	(-1.10)	(-1.68)	(-2.31)*
N	15	22	37	16
Avg res var ('000s)	0.45935	0.25551	0.33815	0.22080
Avg Beta	1.0576	0.7050	0.8480	0.3540

t-statistics in parentheses
* Significant at 5% level
** Significant at 1% level

Table 5.19

Excess Returns and Cumulative Excess Returns around Baker Plan Event Using OLS Model (Event Date 851007)

Day	High Exposure Group	Medium Exposure Group	All Exposed Banks	Zero Exposure Group
	Panel A: Daily Average Excess Returns			
-3	0.0110	0.0027	0.0063	0.0054
	(3.51)**	(0.72)	(2.84)**	(1.32)
-2	0.0001	0.0020	0.0012	0.0001
	(0.22)	(0.94)	(0.88)	(0.25)
-1	0.0117	0.0015	0.0058	0.0025
	(3.08)**	(0.26)	(2.22)*	(1.08)
0	**0.0092**	**0.0038**	**0.0061**	**-0.0037**
	(2.75)**	**(1.23)**	**(2.73)****	**(-1.07)**
1	0.0022	0.0030	0.0027	-0.0018
	(1.16)	(0.89)	(1.44)	(-0.27)
2	0.0058	0.0012	0.0032	0.0120
	(1.63)	(0.40)	(1.37)	(3.33)**
3	0.0105	0.0083	0.0092	0.0020
	(3.18)**	(3.20)**	(4.50)**	(0.85)
	Panel B: Cumulative Average Excess Returns			
-1 0	0.0209	0.0052	0.0119	-0.0013
	(4.12)**	(1.06)	(3.50)**	(-0.01)
-1 +1	0.0231	0.0083	0.0146	-0.0031
	(4.04)**	(1.38)	(3.69)**	(-0.15)
-1 +2	0.0288	0.0095	0.0178	0.0090
	(4.31)**	(1.39)	(3.88)**	(1.54)
-1 +3	0.0393	0.0178	0.0270	0.0109
	(5.28)**	(2.68)**	(5.48)**	(1.75)
N	15	20	35	14
Avg res var ('000s)	0.32686	0.18597	0.24635	0.24706
Avg Beta	1.0385	0.7106	0.8511	0.4316

t-statistics in parentheses
* Significant at 5% level
** Significant at 1% level

Table 5.20

Excess Returns and Cumulative Excess Returns around Oil Price Slump Event Using OLS Model (Event Date 860204)

Day	High Exposure Group	Medium Exposure Group	All Exposed Group	Zero Exposure Group
Panel A: Daily Average Excess Returns				
-3	-0.0005	0.0032	0.0008	-0.0032
	(-0.31)	(1.12)	(0.31)	(-0.32)
-2	-0.0069	0.0006	-0.0030	0.0014
	(-2.19)*	(0.10)	(-1.49)	(-0.02)
-1	0.0011	0.0008	0.0010	-0.0025
	(0.56)	(0.05)	(0.47)	(-0.36)
0	**-0.0194**	**-0.0045**	**-0.0104**	**0.0015**
	(-6.01)**	**(-1.54)**	**(-3.41)****	**(0.53)**
1	-0.0205	-0.0090	-0.0143	0.0036
	(-5.85)**	(-2.40)*	(-5.82)**	(1.13)
2	0.0040	-0.0051	-0.0008	0.0016
	(1.22)	(-1.67)	(-0.36)	(0.54)
3	0.0010	0.0006	0.0007	-0.0021
	(1.00)	(0.96)	(1.36)	(-0.24)
Panel B: Cumulative Average Excess Returns				
-1 0	-0.0183	-0.0037	-0.0104	-0.0010
	(-3.85)**	(-1.06)	(-3.41)**	(0.12)
-1 +1	-0.0387	-0.0128	-0.0247	0.0026
	(-6.53)**	(-2.25)*	(-6.14)**	(0.75)
-1 +2	-0.0348	-0.0179	-0.0255	0.0042
	(-5.04)**	(-2.78)**	(-5.50)**	(0.92)
-1 +3	-0.0338	-0.0173	-0.0247	0.0021
	(-4.06)**	(-2.06)*	(-4.31)**	(0.72)
N	15	17	32	14
Avg res var ('000s)	0.21761	0.18687	0.20051	0.29519
Avg Beta	0.9986	0.7399	0.8612	0.4335

t-statistics in parentheses
* Significant at 5% level
** Significant at 1% level

Table 5.21

Summary of Event-Day Average Excess Returns for U.S. Banks

Event	High Exposure	Medium Exposure	All Exposed	Zero Exposure
1. Falkland War				
(a)@	0.0053	0.0015	0.0033	-0.0028
	(1.58)	(0.50)	(1.45)	(-0.63)
(b)#	-0.0184	-0.0041	-0.0108	0.0070
	(-3.34)**	(-0.88)	(-2.94)**	(0.74)
2. Mexican@ Moratorium	-0.0222	-0.0143	-0.0177	0.0069
	(-6.56)**	(-4.48)**	(-7.70)**	(1.93)
3. Argentinean@ Moratorium	-0.0130	-0.0028	-0.0072	-0.0005
	(-2.93)**	(-1.02)	(-2.70)**	(-0.01)
4. Legislative Actions@				
(a)	0.0054	0.0075	0.0066	0.0097
	(1.34)	(1.83)	(2.26)*	(1.92)
(b)	-0.0067	-0.0003	-0.0030	0.0034
	(-1.17)	(-0.05)	(-0.80)	(0.91)
(c)	-0.0021	-0.0018	-0.0019	0.0078
	(-0.34)	(-0.23)	(-0.40)	(2.13)*
(d)	-0.0140	-0.0052	-0.0089	-0.0113
	(-2.80)**	(-2.08)*	(-3.40)**	(-2.13)*
(e)	-0.0006	0.0026	0.0013	-0.0057
	(0.10)	(0.28)	(0.28)	(-1.28)
(f)	-0.0016	0.0029	0.0011	0.0024
	(-0.40)	(1.03)	(0.54)	(0.89)
(g)	0.0074	0.0005	0.0033	0.0016
	(1.85)	(0.35)	(1.44)	(0.12)
5. Bolivian# Moratorium	-0.0218	-0.0038	-0.0112	-0.0052
	(-4.62)**	(-0.74)	(-3.53)**	(-0.68)

Table 5.21 (contd.)

Event	High Exposure	Medium Exposure	All Exposed	Zero Exposure
6. Cartagena@ Declaration	0.0060 (1.92)	0.0073 (2.41)*	0.0068 (3.08)**	0.0014 (0.45)
7. Peru's@ Declaration	-0.0013 (-0.02)	-0.0056 (-1.59)	-0.0039 (-1.24)	-0.0060 (-1.74)
8. Baker Plan #	0.0209 (4.12)**	0.0052 (1.06)	0.0119 (3.50)**	-0.0013 (-0.01)
9. Oil Price@ Slump	-0.0194 (-6.01)**	-0.0045 (-1.54)	-0.0104 (-3.41)**	0.0015 (0.53)
10. Debt-Resch.@ Agreement	-0.0112 (-2.51)*	-0.0062 (-1.81)	-0.0083 (-3.01)**	0.0001 (0.14)
11. Brazilian# Moratorium	-0.0288 (-5.36)**	-0.0020 (-0.75)	-0.0135 (-4.08)**	-0.0085 (-0.97)
12 Citicorp@ Loan Loss Provision	-0.0039 (-1.25)	-0.0030 (-0.82)	-0.0024 (-1.32)	-0.0012 (-0.79)

t-statistics in parentheses
* Significant at 5% level
** Significant at 1% level
@ Day 0 returns
# Two-day (-1,0) returns

CHAPTER 6

HYPOTHESES TESTING

The significance of excess returns obtained during the event period, as discussed in the previous chapter, paves way to the testing of various hypotheses proposed to explain the Latin American debt problem.

In the next section, the results of new information and capital regulation hypotheses tests for each event are presented. The results of tests for risk characteristics of the sample are discussed in Section B. The last section summarizes the chapter.

A. Results of Hypotheses Tests

1. Borrower Induced Events

Mexican Moratorium

The results of regressions are reported in Table 6.1. From Panel (a) of Table 6.1, it is evident that the banks with Latin American loans experienced excess returns of nearly -2.5% compared to those without the Latin debt. Thus, the market could broadly distinguish between the exposed and non-exposed banks. But, the results of the regression between excess returns and the Latin American exposure (Table 6.1 (e)) show that there is no effect of exposure on event day excess

returns.[1] This result is consistent with Bruner and Simms (1987), but in sharp contrast to Lamy, Marr, and Thompson (1986) who find a significant impact of debt exposure on event day excess returns. Their regression sample includes both exposed and non-exposed banks. When this regression is re-estimated to encompass the set of both exposed and non-exposed banks, the estimated coefficient, shown below, is close to that of Lamy, Marr, and Thompson although not significant at the conventional 5% level.

$$\epsilon_i = \underset{(-0.46)}{-.0026} \; \underset{(-1.73)}{-.0111} \, LAEXP_i; \qquad R^2 = .054; \quad F = 3.0$$

Thus, the results indicate that although there is a difference in average excess returns between exposed and non-exposed banks, there is no systematic relation between excess returns and debt exposure within the group of banks that had exposure to Latin American debt.

Two plausible explanations can be offered as to why the market could not differentiate banks among the exposed group according to the level of exposure of each bank. The first explanation is that bank exposure levels to individual countries were not publicly known at the time of the Mexican announcement. Hence, the market could broadly categorize

[1]The regression model is also estimated using the Mexican exposure as a dependent variable. The results are similar to those with total Latin American exposure. Hence, only the results with total Latin American exposure are reported here for all the events.

banks as high-, medium-, and zero- exposure groups, but could not make finer distinctions within each group. If it could, then the market would be strong-form efficient. However, this explanation fails in the context of Falkland war event where the Latin American exposure variable is statistically significant.

An alternative explanation is that even before the Mexican moratorium, investors were sufficiently aware of the deteriorating market value of Latin American debt and impounded it in bank share prices prior to the Mexican moratorium announcement. In other words, the moratorium announcement has no information content about the quality of the Lain American loans. An observation of the trend in oil prices and world interest rates could enable investors to foresee the impending crisis in the Mexican economy. From early 1979, the real interest rates had gone up considerably. The interest rates on LDC loans are tied to the London Interbank Offered Rate (LIBOR) which increased from 8.7% in 1978 to 13.0% in 1979 and to 17.5% in 1981. Additionally, the export growth of Mexico declined from 54.3% in 1980 to 21.9% in 1981 and to 7.3% in 1982. The world oil market weakened since 1981. A combination of the above factors forced the debt-service ratio of Mexico to leap from 22% in 1974 to 49% in 1981 and to 59% in 1982 (Cline 1983, pp. 17-19). The severe recession in the world economy in 1980-82 made matters worse. It is plausible that investors could have anticipated

the moratorium announcement as a culmination of all the factors described above.

Table 6.1 (d) shows that the market differentiated banks in accordance with the bank's capital adequacy. The qualitative independent variable for capital adequacy (DUMCAP) is significant at 5% level on day 0 with a t-statistic of -2.12. The difference in average excess returns between capital sufficient and capital deficient banks is 1.31 which is statistically significant.

The results of regression between the cross section of excess returns and the ratio of primary capital to total assets for the set of exposed banks are reported in Table 6.1 (f). The results indicate that this continuous quantitative variable has the expected positive sign and is significant at the 10% level for day 0 returns and at 5% level for two-day (day -1 and day 0) returns. Thus, these results lend support to the hypothesis regarding the differential impact of the Mexican moratorium announcement on capital sufficient and capital deficient banks. The capital deficient banks experienced a loss of about 3.5% in market value in the two-day period compared to the capital sufficient banks. The market also discounted the capital deficient banks by about 1.5% for every one percent shortage of regulatory capital.

Argentinean Moratorium

The set of exposed banks have average excess returns of -0.72% (t = -2.70) on the event day of the report of the rumor

of an Argentinean default. In contrast, the set of non-exposed banks have average excess returns for the event day that are close to zero and are not statistically significant. The difference in returns between the exposed and the non-exposed banks, however, is not statistically significant, as shown in Table 6.2 (a).

When the sample of exposed banks are disaggregated into capital sufficient versus capital deficient subsamples, the capital deficient banks experience average excess returns that are negative and significant (-1.74%, t = -3.49). The difference in event day excess returns between capital deficient banks and the non-exposed banks is -1.69% and is statistically significant at 5% level, as shown in Table 6.2 (b). In contrast, the average excess returns for capital sufficient banks with Latin American debt exposure are close to zero on the announcement day (-0.21% with a t-statistic of -0.84). The dummy variable for the difference in returns between the capital sufficient banks and zero exposure banks is not statistically significant (Table 6.2 (c)). Thus, the market could clearly distinguish between capital deficient, non-exposed banks, but made no distinction between the capital sufficient, non-exposed banks.

The dummy variable, DUMCAP, that distinguishes between capital sufficient and capital deficient banks, obtains a coefficient of -1.53% with a t-statistic of -2.19 (Table 6.2 (d)). Thus, the results are statistically significant leading

to the rejection of the null hypothesis of the equality of the means.

The results of the regression between the cross section of excess returns for exposed banks and the ratio of primary capital to total assets for each bank are reported in Table 6.2 (f). The coefficient for the PCAP variable is 0.0058 with a t-statistic of 1.75 which is significant at the 10% level.

Bolivian Moratorium

The event study results for the Bolivian moratorium show that the average excess returns for the exposed banks are -0.60% (t = -2.73) on day 0 and -1.12% (t = -3.53) for two-days (day -1, day 0). The set of non-exposed banks have average excess returns close to zero and are not statistically significant. The difference in returns between exposed and non-exposed banks is not statistically significant as shown by the dummy variable, DUMEXP, in Table 6.3 (a).

The results of the regression between the cross section of excess returns for the set of all exposed banks and the ratio of Latin American debt exposure to total assets (LAEXP) for each bank are reported in Table 6.3 (e). The coefficient for the exposure variable obtains a value of -0.0041 (t = -2.11) on day 0, and -0.0055 (t = -1.77) for two-day returns. This implies that the Bolivian moratorium announcement conveyed information to the market about the deteriorating quality of the Latin American loans and the market distinguished banks according to their exposure to Latin

America. This result is in contrast to the results of the Mexican moratorium event. One possible reason might be that by the time of the Bolivian moratorium, information regarding the loan exposure levels of banks to individual countries was publicly available. Thus, this is a test of semi-strong form efficiency of market as opposed to strong-form efficiency test in the case of the Mexican moratorium event. Although Bolivia is a small country with a total foreign debt of less than $4 billion, the Bolivian moratorium might have been interpreted by the market as a signal of the continuing trouble with all the Latin American loans.

The subsample of capital deficient banks experienced average excess returns of -1.94% (t = -3.97) on day 0 and -4.00% (t = -5.77) for the two-day period. Table 6.3 (b) shows that the capital deficient banks have higher excess returns which are statistically significant as compared to the non-exposed group (DUMEXP = -0.0171 on day 0 with a t-statistic of -2.14). In contrast, the subsample of capital sufficient banks have insignificant average excess returns. The market did not distinguish the subsamples of capital sufficient banks and zero exposure banks (Table 6.3 (c)).

The dummy variable for capital adequacy, DUMCAP, obtains a coefficient of -0.0169 (t = -2.14) on day 0, and -0.0363 (t = -3.04) for a two-day period. Results that parallel the Mexican case are also obtained when the cross sectional returns for exposed banks are regressed on the primary capital

ratio (PCAP) for each bank. The coefficient of the PCAP variable for two-day returns is 0.0150 (t = 2.11) which is significant at the 5% level. Thus, the market clearly distinguished banks according to capital adequacy.

Brazilian Moratorium

The event study results for the Brazilian moratorium show that the non-exposed banks have insignificant excess returns. In contrast, the exposed group of banks experienced average excess returns of -1.12% (t = -4.64) on day 0 and -1.35% (t = -4.08) for the two-day period. The difference-in-means test using a dummy variable (DUMEXP) shows that the difference in average excess returns between exposed and non-exposed groups is not statistically significant (Table 6.4 (a)). However, the difference in returns between high exposure group and zero exposure group is significant (Table 6.4 (b)). The market also distinguished between the high- and medium-exposure groups as shown by the significance of the dummy variable in Table 6.4 (d). The coefficient of this dummy variable takes on a value of -0.0157 (t = -2.18) on day 0 and -0.0281 (t = -2.88) for the two-day period, both of which are significant at the 5% level.

The results of the regression between the excess returns for the group of all exposed banks and the level of Latin American exposure are reported in Table 6.4 (e). The coefficient for the exposure variable has the right sign and obtains a value of -0.0091 (t = -2.89) on day 0 and -0.0131

(t = -2.97) for the two-day period, both of which are significant at the 1% level. These results confirm the conclusions of Musumeci and Sinkey (1990a) who report a significant negative relationship between event day excess returns and Brazilian exposure.

The sample of the exposed banks could not be subdivided according to capital adequacy as all banks in the sample satisfy the minimum primary capital requirements.

The regression between excess returns for the exposed banks and the primary capital ratio shows that capital is not relevant at the time of the Brazilian moratorium event (Table 6.4 (f)). Musumeci and Sinkey (1990a) regress event day excess returns against each bank's ratio of market value of common equity to total assets and find significant relationship. However, when they use the book measure of total equity (which includes preferred stock), the capital variable was not significant. In this study also the equity to assets variable was found to be significant, but the primary capital ratio variable is not significant. Thus, the results of this study are in agreement with those of Musumeci and Sinkey (1990a).

To summarize, the moratoria by Mexico, Bolivia, and Brazil follow an interesting pattern of results.[2] The events

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[2]The fourth event in this category, the rumor of Argentinean default, followed immediately after the Mexican moratorium and closely parallels the results of the Mexican moratorium event.

have information content in that the exposed banks have significant excess returns and the non-exposed banks have no effect. For the Mexican moratorium event, the Latin American exposure of the banks is not significant, leading to the speculation that investors were already aware of the deteriorating quality of the Latin debt and incorporated this awareness in bank share prices prior to the event. In the case of the Bolivian moratorium, both Latin American exposure and primary capital ratio are significant. The Bolivian moratorium was announced at a time when the debt crisis was at its peak, with multiple and multiyear reschedulings. The exposure of banks to individual countries is public knowledge. Capital regulation was tightened and banks were in the process of strengthening their capital ratios by raising capital in the market. The capital ratios were still not adequate for some big banks. Hence, capital adequacy is relevant at the time of the Bolivian moratorium. For the Brazilian moratorium, only the Latin American exposure is significant. The event occurred at a time when a major rescheduling agreement was signed (September 30, 1986) between Mexico and the creditor banks and it was hoped that the debt crisis was manageable. Thus, the Brazilian moratorium has information content, reminding the market that the debt crisis is not yet over. However, capital adequacy is no longer an issue because all the banks had already built up the required regulatory capital. Thus, although the three moratoria form a similar

category of events with similar pattern of average excess returns during the event period, the underlying dynamics of each moratorium is different. There is a gradual progression of increasing importance of the exposure variable and decreasing importance of the capital variable. This suggests that the information conveyed by each moratorium event is different.

The difference in average excess returns between capital sufficient and capital deficient banks for the four events--Mexican moratorium, Argentinean moratorium, Bolivian moratorium, and Falkland War--is approximately 1.50%.[3] This figure is close to the estimate of the average excess returns associated with announcements of bank seasoned common issues. Consequently, the evidence is consistent with the hypothesis that the reaction of the financial market to these events impounded information about the probability of increased regulatory pressure on exposed banks with weak regulatory capital positions, to enter the capital market and issue seasoned equity or to reduce leverage and, therefore, forego some positive net present value projects.

2. External Events

Falkland War

This event relates to the devaluation of peso by

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[3]The results of the Falkland War event are discussed in the next sub-section.

Argentina during the Falkland War. Results show that the group of all exposed banks experienced average excess returns of -0.57% (t = -2.07) on day 0 and -1.08% (t = -2.94) for the two-day (day -1 and day 0) period. In contrast, the non-exposed banks have positive, but insignificant excess returns. Table 6.5 (a) shows that the difference is statistically significant.

The regression results in Table 6.5 (e) indicate that the exposure variable (LAEXP) has the expected negative sign and is statistically significant. This result is in sharp contrast to that of the Mexican moratorium event.

Falkland war event precedes all other events selected for this study. In 1982, information regarding the exposure of banks to individual countries was not public knowledge. In spite of this lack of information, the results here indicate that the market was able to distinguish banks according to level of exposure, thus implying that the market was strong-form efficient with respect to this information.

The results in Table 6.5 (b) and 6.5 (c) show that the market distinguished capital deficient, non-exposed banks, but not the capital sufficient, non-exposed banks. Again, there is a systematic difference between the capital sufficient and capital deficient banks, as shown by the significance of the dummy variable, DUMCAP, for capital adequacy in Table 6.5 (d). The difference in average excess returns between the capital deficient and capital sufficient groups is -0.99% (t = -1.95)

for day 0 and -1.55% (t = -2.61) for the two-day period. The results of the regression shown in Table 6.5 (f) indicate that the continuous variable, PCAP, is significant at the 5% level on day -1 and day 0, and at 1% level for the two-day period.

In sum, the Falkland war event did convey information about the quality of the Latin American loans, even before the Mexican moratorium announcement. The market discounted the Latin American loan portfolios of the banks according to the degree of exposure of each bank. The market also differentiated banks on the basis of capital adequacy.

Oil Price Slump

The event study results of Oil Price Slump event show that the sample of all exposed banks experienced average excess returns of -1.04% (t = -3.41) on day 0 and -1.43% (t = -5.82) on day 1, for a sum of -2.47% in two-days. The event has no effect on the non-exposed group. The difference in average excess returns between the exposed and non-exposed groups amounts to about -3% and is statistically significant (Table 6.6 (a)).

The market could distinguish banks within the exposed group according to each bank's exposure to Latin America, as is evidenced by the regression results in Table 6.6 (b). The coefficient of the Latin American exposure variable (LAEXP) for the set of exposed banks is significant on day 0, day 1, and for the two-day period (day -1 and day 0). Thus, the declining oil prices conveyed information to the market about

the deterioration in the quality of bank assets with Latin American loans.

Due to the involvement of both oil exporting and oil importing countries in the Latin American debt crisis, slump in oil prices presents an interesting contrast to examine. The sharp decline in oil prices affected the oil-exporting countries like Mexico and Venezuela negatively, while giving a boost to the oil-importing economies of Brazil and Argentina. Thus, banks with loans to Mexico and Venezuela should experience negative excess returns while those with loans to Brazil and Argentina should have positive excess returns. To test this proposition, the following regression model is estimated:

$$\epsilon_{it} = a + b_1 \text{ MXVZEXP}_i + b_2 \text{ ARBZEXP}_i + u_{it}, \quad (t = -1,0),$$

where $MXVZEXP_i$ is the sum of loans outstanding to Mexico and Venezuela divided by the market value of equity for bank i, and $ARBZEXP_i$ is the sum of loans to Argentina and Brazil deflated by the market value of equity for bank i.

The results of the regression for the set of exposed banks, reported in Table 6.6 (c), indicate that the coefficients b_1 and b_2 have the expected signs and are significant on day 1. Both the exposure variables are statistically significant at 5% level for the high exposure banks on day -1 (Table 6.6 (d)). For medium exposure banks,

the coefficients are significant on day 1. These results suggest that the market could analyze the impact of declining oil prices on various economies and could incorporate it into stock prices of banks with loans to those countries.

The primary capital variable has no effect on excess returns of banks with Latin American loans as shown in Table 6.6 (f). By 1986, all banks in the sample satisfy the regulatory requirement of minimum capital ratios.

B. Change in Risk Characteristics

The risk characteristics of different groups of banks in the sample before and after each event are shown in Tables 6.7 to 6.14. The tables show the beta of the portfolio, variance of market returns, variance of residual errors (firm-specific risk) and variance of the portfolio (total risk).

For the group of non-exposed banks, the change in risk characteristics is not statistically significant for any event. Thus, this group again acts as a control group. The shift in beta for other groups is, in general, insignificant for all events, except for the Bolivian moratorium and the Mexican debt-rescheduling events. The Bolivian moratorium event resulted in an increase in beta of about 25% for the set of banks with Latin American debt. Both high- and medium-exposure banks experienced similar increases in beta. In contrast, the set of all exposed banks had a decline in beta of 22% ($t = -2.65$) after the Mexican debt-rescheduling event.

For the high exposure group, the beta dropped by 26% (t = -2.20), whereas for the medium exposure group the change is not statistically significant.

For the Falkland War event, the total riskiness of the portfolio of all exposed banks increased by about 70%. Both systematic and unsystematic components of risk contributed to the change in total risk. The residual variance for both the high- and medium- exposed banks increased by more than 60% and the change is statistically significant. Thus, the first event in the Latin American debt crisis in this study resulted in significant change in the return and risk characteristics of banks having Latin American loans.

The three moratoria by Mexico, Bolivia and Brazil present an interesting picture. For the Mexican moratorium event, the set of banks with Latin American loans experienced an increase of about 24% in total risk which is a direct consequence of an increase in the residual variance. During the Bolivian moratorium, there is very little increase in the total risk of the exposed banks, whereas for the Brazilian moratorium, there is a slight decrease in the total risk.

The same pattern is observed for the portfolio of high exposure banks: an increase of about 20% for the Mexican moratorium, little change during the Bolivian moratorium, and a decrease of about 8% for the Brazilian moratorium. This may be called as adaptive learning by the market. There is a gradual change in reaction to successive moratoria as

investors grew more familiar with them. This trend is reflected in the change of risk characteristics.

The other events, Cartagena declaration, Baker plan, oil price slump, and Mexican debt-rescheduling agreement, have resulted in an increase in the total risk of the exposed group. For the oil price slump event, the total risk of exposed banks shot up by 54% and is statistically significant. Thus, the market is concerned with the impact of declining oil prices on the value and riskiness of the bank stocks with Latin American loans. In sharp contrast to the above, the announcement of Baker plan resulted in positive excess returns, but a simultaneous increase in the riskiness of banks with Latin loans. The total risk of the high exposure group has changed very little. The medium exposure group experienced more than doubling of the total risk. Investors might have perceived that the benefits of Baker plan accrue only to the high exposure group, as they are expected to share the new lending of $20 billion proposed in the Baker plan. Similar results are obtained for the Mexican debt-rescheduling event. There is no effect on high exposure banks, whereas the riskiness of the medium exposure banks increased by about 50%. The Cartagena declaration is treated as a non-event and there is no change in the riskiness of any group of banks. The market might have perceived it as a political event with very little economic consequences.

C. Chapter Summary

The results for the four events, Falkland war, Mexican moratorium, rumor of Argentinean default, and Bolivian moratorium, demonstrate that among the set of exposed banks, capital deficient firms sustain significantly more unfavorable excess returns in response to these events than do capital sufficient ones. The average excess returns for capital sufficient firms with debt exposure are either zero or modest. This implies that investors were apparently already aware of the deteriorating market value of Latin American debt and that this was reflected in bank share prices prior to these events.

The interaction of bank capital regulation and bank examination procedures can induce the financial market to alter assessments as to whether regulators will exercise their authority to require banks to mark to market loans that have sustained reductions in quality. As a result, the market anticipates increased regulatory pressures for exposed banks with insufficient regulatory capital to tap the bank equity market or to reduce leverage and forego some positive net present value projects. The results in this chapter provide important perspective on the economic impact of capital regulation and clarify the link between external exogenous events and bank value. The results also clarify some of the ambiguities presented by earlier literature on the Mexican debt moratorium.

Table 6.1

Results of Regressions for Mexican Moratorium Event

a) MODEL: $\epsilon_{it} = a + b\ DUMEXP_i + u_{it}$

Cumulation Period	All Exposed Banks a	b	R^2
0	0.0069 (1.01)	-0.0246 (-3.11)*	0.1591
-1, 0	0.0174 (1.79)@	-0.0230 (-2.02)#	0.0742
N	53		

DUMEXP = 1 for exposed banks
= 0 for non-exposed banks

b) MODEL: $\epsilon_{it} = a + b\ DUMEXP_i + u_{it}$

Cumulation Period	Capital Deficient a	b	R^2
0	0.0069 (0.84)	-0.0333 (-2.80)*	0.2391
-1, 0	0.0174 (1.65)	-0.0464 (-3.06)*	0.2722
N	27		

DUMEXP = 1 for capital deficient banks
= 0 for non-exposed banks

Table 6.1 (contd.)

c) MODEL: $\epsilon_{it} = a + b\ DUMEXP_i + u_{it}$

Cumulation Period	Capital Sufficient Group a	b	R^2
0	0.0069 (1.45)	-0.0203 (-3.42)*	0.2357
-1, 0	0.0174 (2.42)#	-0.0112 (-1.26)	0.0400
N	40		

DUMEXP = 1 for capital sufficient banks
= 0 for non-exposed banks

d) MODEL: $\epsilon_{it} = a + b\ DUMCAP_i + u_{it}$

Cumulation Period	All Exposed Banks a	b	R^2
-1	0.0195 (4.08)*	-0.0221 (-2.67)#	0.1618
0	-0.0134 (-2.52)#	-0.0131 (-2.12)#	0.0519
-1, 0	0.0062 (0.88)	-0.0352 (-2.89)*	0.1841
N	39		

DUMCAP = 1 for capital deficient banks
= 0 for capital sufficient banks

Table 6.1 (contd.)

e) MODEL: $\epsilon_{it} = a + b\ LAEXP_i + u_{it}$

Cumulation Period	All Exposed Banks a	b	R^2
0	-0.0191 (-2.78)*	0.0005 (0.27)	0.0020
-1, 0	-0.0028 (-0.29)	-0.0009 (-0.37)	0.0036
N	39		

f) MODEL: $\epsilon_{it} = a + b\ PCAP_i + u_{it}$

Cumulation Period	All Exposed Banks a	b	R^2
0	-0.0608 (-2.40)#	0.0077 (1.72)@	0.0742
-1, 0	-0.0921 (-2.64)#	0.0155 (2.52)#	0.1465
N	39		

t-statistics in parentheses; @ Significant at 10% level;
Significant at 5% level; * Significant at 1% level;

Table 6.2

Results of Regressions for Argentinean Moratorium Event

a) MODEL: $\epsilon_{it} = a + b\ DUMEXP_i + u_{it}$

Cumulation Period	All Exposed Banks a	b	R^2
0	-0.0005 (-0.10)	-0.0067 (-1.10)	0.0235
N	53		

DUMEXP = 1 for exposed banks
= 0 for non-exposed banks

b) MODEL: $\epsilon_{it} = a + b\ DUMEXP_i + u_{it}$

Cumulation Period	Capital Deficient a	b	R^2
0	-0.0005 (-0.12)	-0.0169 (-2.69)#	0.2247
N	27		

DUMEXP = 1 for capital deficient banks
= 0 for non-exposed banks

Table 6.2 (contd.)

c) MODEL: $\epsilon_{it} = a + b\ DUMEXP_i + u_{it}$

Cumulation Period	Capital Sufficient a	b	R^2
0	-0.0005 (-0.11)	-0.0016 (-0.27)	0.0019
N	40		

DUMEXP = 1 for capital sufficient banks
= 0 for non-exposed banks

d) MODEL: $\epsilon_{it} = a + b\ DUMCAP_i + u_{it}$

Cumulation Period	All Exposed Banks a	b	R^2
0	-0.0022 (-0.53)	-0.0153 (-2.19)#	0.1145
N	39		

DUMCAP = 1 for capital deficient banks
= 0 for capital sufficient banks

Table 6.2 (contd.)

e) MODEL: $\epsilon_{it} = a + b\ LAEXP_i + u_{it}$

Cumulation Period	All Exposed Banks a	b	R^2
0	0.0001 (0.02)	-0.0025 (-1.86)@	0.0859
-1, 0	-0.0070 (-0.91)	-0.0002 (-0.09)	0.0002
N	39		

f) MODEL: $\epsilon_{it} = a + b\ PCAP_i + u_{it}$

Cumulation Period	All Exposed Banks a	b	R^2
0	-0.0397 (-1.98)@	0.0058 (1.75)@	0.0678
N	39		

t-statistics in parentheses; @ Significant at 10% level;
Significant at 5% level; * Significant at 1% level;

Table 6.3

Results of Regressions for Bolivian Moratorium Event

a) MODEL: $\epsilon_{it} = a + b\ DUMEXP_i + u_{it}$

Cumulation Period	All Exposed Banks a	b	R^2
0	-0.0023 (-0.43)	-0.0037 (-0.58)	0.0067
-1, 0	-0.0052 (-0.62)	-0.0060 (-0.62)	0.0076
N	52		

DUMEXP = 1 for exposed banks
= 0 for non-exposed banks

b) MODEL: $\epsilon_{it} = a + b\ DUMEXP_i + u_{it}$

Cumulation Period	Capital Deficient a	b	R^2
0	-0.0023 (-0.47)	-0.0171 (-2.14)#	0.1942
-1, 0	-0.0052 (-0.75)	-0.0349 (-3.11)*	0.3372
N	21		

DUMEXP = 1 for capital deficient banks
= 0 for non-exposed banks

Table 6.3 (contd.)

c) MODEL: $\epsilon_{it} = a + b\ DUMEXP_i + u_{it}$

Cumulation Period	Capital Sufficient a	b	R^2
0	-0.0023 (-0.45)	-0.0002 (-0.03)	0.0000
-1, 0	-0.0052 (-0.70)	0.0014 (0.16)	0.0006
N	44		

DUMEXP = 1 for capital sufficient banks
= 0 for non-exposed banks

d) MODEL: $\epsilon_{it} = a + b\ DUMCAP_i + u_{it}$

Cumulation Period	All Exposed Banks a	b	R^2
-1	-0.0013 (-0.39)	-0.0193 (-2.73)*	0.1653
0	-0.0025 (-0.70)	-0.0169 (-2.14)#	0.1102
-1, 0	-0.0038 (-0.70)	-0.0363 (-3.04)*	0.2003
N	39		

DUMCAP = 1 for capital deficient banks
= 0 for capital sufficient banks

Table 6.3 (contd.)

e) MODEL: $\epsilon_{it} = a + b\ LAEXP_i + u_{it}$

Cumulation Period	All Exposed Banks a	b	R^2
0	0.0014 (0.29)	-0.0041 (-2.11)#	0.1072
-1, 0	-0.0012 (-0.16)	-0.0055 (-1.77)@	0.0777
N	39		

f) MODEL: $\epsilon_{it} = a + b\ PCAP_i + u_{it}$

Cumulation Period	All Exposed Banks a	b	R^2
-1	-0.0547 (-2.12)#	0.0082 (1.93)@	0.0918
0	-0.0475 (-1.68)@	0.0068 (1.48)	0.0562
-1, 0	-0.1023 (-2.35)#	0.0150 (2.11)#	0.1071
N	39		

t-statistics in parentheses; @ Significant at 10% level;
Significant at 5% level; * Significant at 1% level;

Table 6.4

Results of Regressions for Brazilian Moratorium Event

a) MODEL: $\epsilon_{it} = a + b\ DUMEXP_i + u_{it}$

Cumulation Period	All Exposed Banks a	b	R^2
-1	-0.0005 (-0.10)	-0.0030 (-0.48)	0.0050
0	-0.0080 (-1.32)	-0.0026 (-0.37)	0.0029
-1, 0	-0.0085 (-1.04)	-0.0039 (-0.40)	0.0035
N	49		

DUMEXP = 1 for exposed banks
= 0 for non-exposed banks

b) MODEL: $\epsilon_{it} = a + b\ DUMEXP_i + u_{it}$

Cumulation Period	High Exposure Banks a	b	R^2
-1	-0.0005 (-0.10)	-0.0127 (-1.75)@	0.1001
0	-0.0080 (-1.31)	-0.0118 (-1.41)	0.0713
-1, 0	-0.0085 (-1.04)	-0.0203 (-1.81)@	0.1116
N	28		

DUMEXP = 1 for high exposure banks
= 0 for non-exposed banks

Table 6.4 (contd.)

c) MODEL: $\epsilon_{it} = a + b\ DUMEXP_i + u_{it}$

Cumulation Period	Medium Exposure Banks a	b	R^2
-1	-0.0005 (-0.13)	0.0039 (0.73)	0.0165
0	-0.0080 (-1.44)	0.0039 (0.55)	0.0094
-1, 0	-0.0085 (-1.30)	0.0078 (0.93)	0.0265
N	34		

DUMEXP = 1 for medium exposure banks
= 0 for non-exposed banks

d) MODEL: $\epsilon_{it} = a + b\ DUMEXP_i + u_{it}$

Cumulation Period	All Exposed Banks a	b	R^2
-1	0.0034 (0.81)	-0.0166 (-2.56)#	0.1617
0	-0.0041 (-0.88)	-0.0157 (-2.18)#	0.1222
-1, 0	-0.0007 (-0.11)	-0.0281 (-2.88)*	0.1958
N	36		

DUMEXP = 1 for high exposure banks
= 0 for medium exposure banks

Table 6.4 (contd.)

e) MODEL: $\epsilon_{it} = a + b\ LAEXP_i + u_{it}$

Cumulation Period	All Exposed Banks a	b	R^2
-1	0.0044 (0.95)	-0.0077 (-2.59)#	0.1684
0	-0.0012 (-0.26)	-0.0091 (-2.89)*	0.2019
-1, 0	0.0008 (0.13)	-0.0131 (-2.97)*	0.2113
N	35		

f) MODEL: $\epsilon_{it} = a + b\ PCAP_i + u_{it}$

Cumulation Period	All Exposed Banks a	b	R^2
-1	-0.0509 (-1.28)	0.0064 (1.18)	0.0404
0	0.0273 (0.63)	-0.0053 (-0.89)	0.0234
-1, 0	-0.0356 (-0.58)	0.0030 (0.36)	0.0039
N	35		

t-statistics in parentheses; @ Significant at 10% level;
Significant at 5% level; * Significant at 1% level;

Table 6.5

Results of Regressions for Falkland War Event

a) MODEL: $\epsilon_{it} = a + b\ DUMEXP_i + u_{it}$

Cumulation Period	All Exposed Banks a	b	R^2
-1	0.0019 (0.51)	-0.0073 (-1.69)@	0.0575
0	0.0051 (0.99)	-0.0104 (-1.72)@	0.0592
-1, 0	0.0070 (1.12)	-0.0178 (-2.41)#	0.1100
N	49		

DUMEXP = 1 for exposed banks
= 0 for non-exposed banks

b) MODEL: $\epsilon_{it} = a + b\ DUMEXP_i + u_{it}$

Cumulation Period	Capital Deficient a	b	R^2
-1	0.0019 (0.48)	-0.0110 (-1.91)@	0.1322
0	0.0051 (0.88)	-0.0169 (-2.00)@	0.1426
-1, 0	0.0069 (0.99)	-0.0280 (-2.74)*	0.2340
N	26		

DUMEXP = 1 for capital deficient banks
= 0 for non-exposed banks

Table 6.5 (contd.)

c) MODEL: $\epsilon_{it} = a + b\ DUMEXP_i + u_{it}$

Cumulation Period	Capital Sufficient a	b	R^2
-1	0.0019 (0.47)	-0.0054 (-1.07)	0.0318
0	0.0051 (0.91)	-0.0070 (-1.00)	0.0277
-1, 0	0.0070 (1.05)	-0.0125 (-1.48)	0.0589
N	37		

DUMEXP = 1 for capital sufficient banks
= 0 for non-exposed banks

d) MODEL: $\epsilon_{it} = a + b\ DUMCAP_i + u_{it}$

Cumulation Period	All Exposed Banks a	b	R^2
-1	-0.0035 (-1.50)	-0.0056 (-1.39)	0.0552
0	-0.0020 (-0.66)	-0.0099 (-1.95)@	0.1029
-1, 0	-0.0055 (-1.58)	-0.0155 (-2.61)#	0.1707
N	35		

DUMCAP = 1 for capital deficient banks
= 0 for capital sufficient banks

Table 6.5 (contd.)

e) MODEL: $\epsilon_{it} = a + b\ LAEXP_i + u_{it}$

Cumulation Period	All Exposed Banks a	b	R^2
-1	-0.0032 (-1.07)	-0.0007 (-0.96)	0.0271
0	0.0030 (-0.88)	-0.0028 (-3.17)*	0.2331
-1, 0	-0.0001 (-0.04)	-0.0035 (-3.33)*	0.2517
N	35		

f) MODEL: $\epsilon_{it} = a + b\ PCAP_i + u_{it}$

Cumulation Period	All Exposed Banks a	b	R^2
-1	-0.0337 (-2.83)*	0.0052 (2.40)#	0.1482
0	-0.0383 (-2.44)#	0.0060 (2.13)#	0.1205
-1, 0	-0.0720 (-4.18)*	0.0112 (3.59)*	0.2811
N	35		

t-statistics in parentheses; @ Significant at 10% level;
Significant at 5% level; * Significant at 1% level;

Table 6.6

Results of Regressions for Oil Price Slump Event

a) MODEL: $\epsilon_{it} = a + b\ DUMEXP_i + u_{it}$

Cumulation Period	All Exposed Banks a	b	R^2
0	0.0105 (1.36)	-0.0282 (-3.17)*	0.1669
-1, 0	0.0243 (2.22)#	-0.0299 (-2.37)#	0.1007
N	52		

DUMEXP = 1 for exposed banks
= 0 for non-exposed banks

b) MODEL: $\epsilon_{it} = a + b\ LAEXP_i + u_{it}$

Cumulation Period	All Exposed Banks a	b	R^2
0	-0.0054 (-1.24)	-0.0042 (-1.97)@	0.1256
-1, 0	-0.0016 (-0.33)	-0.0059 (-2.54)#	0.1922
+ 1	-0.0072 (-2.07)#	-0.0031 (-1.86)@	0.1141
N	29		

Table 6.6 (contd.)

c) MODEL: $\epsilon_{it} = a + b_1 \text{ MXVZEXP}_i + b_2 \text{ ARBZEXP}_i + u_{it}$

Cumulation Period	All Exposed Banks a	b_1	b_2	F-stat.	R^2
0	-0.0070 (-1.43)	-0.0022 (-0.12)	-0.0065 (-0.41)	1.02	0.0729
-1, 0	-0.0028 (-0.51)	-0.0184 (-0.93)	0.0047 (0.27)	1.75	0.1186
+1	-0.0051 (-1.48)	-0.0321 (-2.58)#	0.0211 (1.89)@	4.28#	0.2476
N	29				

MXVZEXP = sum of loans outstanding to Mexico and Venezuela divided by the market value of equity

ARBZEXP = sum of loans outstanding to Argentina and Brazil divided by the market value of equity

d) MODEL: $\epsilon_{it} = a + b_1 \text{ MXVZEXP}_i + b_2 \text{ ARBZEXP}_i + u_{it}$

Cumulation Period	High Exposure Banks a	b_1	b_2	F-stat.	R^2
-1	0.0119 (2.48)#	-0.0371 (-3.10)*	0.0249 (2.68)#	4.85#	0.4684
0	-0.0305 (-3.40)*	0.0298 (1.33)	-0.0177 (-1.02)	1.00	0.1540
-1, 0	-0.0186 (-2.40)#	-0.0073 (-0.38)	0.0072 (0.49)	0.13	0.0229
N	14				

Table 6.6 (contd.)

e) MODEL: $\epsilon_{it} = a + b_1\ MXVZEXP_i + b_2\ ARBZEXP_i + u_{it}$

Cumulation Period	Medium Exposure Banks a	b_1	b_2	F-stat.	R^2
0	0.0006 (0.12)	-0.0114 (-0.38)	-0.0013 (-0.04)	0.88	0.1274
-1, 0	0.0038 (0.51)	0.0207 (0.44)	-0.0461 (-0.87)	1.15	0.1602
+1	-0.0017 (-0.63)	-0.0381 (-2.23)#	0.0360 (1.86)@	2.81@	0.3195
N	15				

f) MODEL: $\epsilon_{it} = a + b\ PCAP_i + u_{it}$

Cumulation Period	All Exposed Banks a	b	R^2
0	-0.0391 (-1.09)	0.0040 (0.78)	0.0203
-1, 0	-0.0566 (-1.38)	0.0068 (1.14)	0.0426
N	29		

t-statistics in parentheses; @ Significant at 10% level;
Significant at 5% level; * Significant at 1% level;

Table 6.7

Risk Characteristics of Banks for Mexican Moratorium Event

Parameter	High exposure Pre	High exposure Post	Medium exposure Pre	Medium exposure Post	All Exposed Pre	All Exposed Post	Zero exposure Pre	Zero exposure Post
Beta	.7905	.8815	.4931	.5613	.6183	.6894	.3247	.3775
	(0.80)		(0.92)		(0.99)		(0.91)	
$Var(R_m)$ ('000)					0.077	0.103		
					(1.34)			
$Var(\epsilon_p)$ ('000)	0.318	0.356	0.282	0.357	0.297	0.356	0.395	0.396
	(1.12)		(1.27)		(1.20)		(1.01)	
$Var(R_p)$ ('000)	0.366	0.436	0.301	0.389	0.326	0.405	0.403	0.411
	(1.19)		(1.29)		(1.24)		(1.02)	

Table 6.8

Risk Characteristics of Banks for Bolivian Moratorium Event

Parameter	High exposure Pre	High exposure Post	Medium exposure Pre	Medium exposure Post	All Exposed Pre	All Exposed Post	Zero exposure Pre	Zero exposure Post
Beta	.8280	1.0596	.4931	.6184	.6305	.7972	.3652	.3060
	(1.79)@		(1.80)@		(2.09)#		(-0.76)	
$Var(R_m)$ ('000)					0.051	0.045		
					(1.13)			
$Var(\epsilon_p)$ ('000)	0.232	0.221	0.239	0.265	0.236	0.248	0.274	0.213
	(1.05)		(1.11)		(1.05)		(1.29)	
$Var(R_p)$ ('000)	0.266	0.271	0.251	0.282	0.256	0.277	0.281	0.217
	(1.02)		(1.12)		(1.08)		(1.29)	

Table 6.9

Risk Characteristics of Banks for Brazilian Moratorium Event

Parameter	High exposure Pre	High exposure Post	Medium exposure Pre	Medium exposure Post	All Exposed Pre	All Exposed Post	Zero exposure Pre	Zero exposure Post
Beta	.9571	.8435	.7517	.6906	.8397	.7601	.5756	.4428
	(-0.97)		(-0.70)		(-1.09)		(-0.88)	
$Var(R_m)$ ('000)					0.073	0.078		
					(1.06)			
$Var(\epsilon_p)$ ('000)	0.363	0.339	0.311	0.352	0.333	0.347	0.331	0.293
	(1.07)		(1.13)		(1.04)		(1.13)	
$Var(R_p)$ ('000)	0.430	0.394	0.352	0.389	0.384	0.392	0.355	0.308
	(1.09)		(1.11)		(1.02)		(1.15)	

Table 6.10

Risk Characteristics of Banks for Mexican Debt-Rescheduling Event

Parameter	High exposure Pre	High exposure Post	Medium exposure Pre	Medium exposure Post	All Exposed Pre	All Exposed Post	Zero exposure Pre	Zero exposure Post
Beta	1.0778	0.7941	.7938	.6581	.9155	.7141	.5874	.4940
	(-2.20)#		(-1.66)		(-2.65)*		(-0.73)	
$Var(R_m)$ ('000)					0.066	0.076		
					(1.15)			
$Var(\epsilon_p)$ ('000)	0.320	0.367	0.300	0.467	0.309	0.426	0.315	0.309
	(1.15)		(1.56)		(1.38)		(1.02)	
$Var(R_p)$ ('000)	0.397	0.415	0.342	0.500	0.364	0.465	0.338	0.328
	(1.05)		(1.46)		(1.28)		(1.03)	

Table 6.11

Risk Characteristics of Banks for Falkland War Event

Parameter	High exposure		Medium exposure		All Exposed		Zero exposure	
	Pre-event	Post-event	Pre-event	Post-event	Pre-event	Post-event	Pre-event	Post-event
Beta	.7528	.8941	.5178	.5832	.6288	.7300	.3506	.3429
	(1.25)		(0.83)		(1.36)		(-0.11)	
$Var(R_m)$ ('000)					0.074	0.117		
					(1.58)*			
$Var(\epsilon_p)$ ('000)	0.275	0.444	0.232	0.391	0.252	0.414	0.402	0.383
	(1.61)		(1.69)		(1.64)		(1.05)	
$Var(R_p)$ ('000)	0.317	0.538	0.252	0.431	0.281	0.476	0.411	0.397
	(1.70)		(1.71)		(1.69)		(1.04)	

Table 6.12

Risk Characteristics of Banks for Cartagena Declaration Event

Parameter	High exposure		Medium exposure		All Exposed		Zero exposure	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Beta	0.8599	1.0585	.5215	.6226	.6587	.8149	.3556	.3529
	(1.54)		(1.43)		(1.91)@		(-0.04)	
$Var(R_m)$ ('000)					0.051	0.044		
					(1.16)			
$Var(\epsilon_p)$ ('000)	0.230	0.209	0.246	0.271	0.239	0.245	0.270	0.222
	(1.10)		(1.10)		(1.03)		(1.22)	
$Var(R_p)$ ('000)	0.268	0.258	0.260	0.288	0.261	0.274	0.276	0.227
	(1.04)		(1.11)		(1.05)		(1.22)	

Table 6.13

Risk Characteristics of Banks for Baker Plan Event

Parameter	High exposure Pre	High exposure Post	Medium exposure Pre	Medium exposure Post	All Exposed Pre	All Exposed Post	Zero exposure Pre	Zero exposure Post
Beta	1.0385	1.1545	.7106	.8019	.8511	.9515	.4316	.5983
	(1.00)		(1.35)		(1.35)		(1.50)	
$Var(R_m)$ ('000)					0.035	0.066		
					(1.89)*			
$Var(\epsilon_p)$ ('000)	0.327	0.287	0.186	0.379	0.246	0.341	0.247	0.333
	(1.14)		(2.04)		(1.39)		(1.35)	
$Var(R_p)$ ('000)	0.365	0.375	0.204	0.421	0.271	0.400	0.254	0.357
	(1.03)		(2.06)		(1.48)		(1.41)	

Table 6.14

Risk Characteristics of Banks for Oil Price Slump Event

Parameter	High exposure Pre	High exposure Post	Medium exposure Pre	Medium exposure Post	All Exposed Pre	All Exposed Post	Zero exposure Pre	Zero exposure Post
Beta	.9985	.9476	.7213	.7689	.8554	.8500	.4644	.5521
	(-0.40)		(0.56)		(-0.07)		(0.71)	
$Var(R_m)$ ('000)					0.034	0.074		
					(2.18)*			
$Var(\epsilon_p)$ ('000)	0.218	0.361	0.187	0.241	0.200	0.294	0.295	0.340
	(1.66)		(1.29)		(1.47)		(1.15)	
$Var(R_p)$ ('000)	0.252	0.427	0.205	0.285	0.225	0.347	0.302	0.363
	(1.69)		(1.39)		(1.54)		(1.20)	

@ Significant at 10% level.
# Significant at 5% level.

CHAPTER 7

ANALYSIS OF BRITISH AND CANADIAN BANKS

The analysis of events related to the Latin American debt problem has been limited so far to the U.S banks. This chapter extends the analysis of events to the British and the Canadian banks to assess international differences in investor reaction to shocks to banking system. As noted in Chapter 3, the British and the Canadian banks, like the U.S. banks, are substantial lenders to Latin America. Their Latin American loan outstandings amount to more than 100% of their shareholder equity. The event study results of each event on these banks including a comparison with their U.S. counterparts are discussed in the next Section. The second stage of analysis involving regressions on excess returns is not undertaken here because of the very small sample sizes of the British and the Canadian banks. In Section B, some plausible explanations for the unique results with respect to the Canadian banks are examined. The last section summarizes the discussion.

A. Event Study Results on U.K. and Canadian Banks

1. Borrower-induced Events

Mexican moratorium

The event study results of the Mexican moratorium are

shown in Table 7.1. The results indicate that the U.K. banks experienced average excess returns of -1.52% (t = -2.15) on the event day . (The U.S. banks with Latin American loans have comparative excess returns of -1.77% on day 0). The average excess returns after day 0 are not significant. The cumulative excess returns (CARs) from day -1 to day 10 are all negative, but not significant.

In contrast, the average excess returns for the Canadian banks on the event day are not statistically different from zero. The excess returns become significantly negative only on day +4. As in the case of the U.S. and the U.K. banks, the Canadian banks also experienced significant positive returns on the two days (day -2 and day -1) prior to the event day. This may be due to the fact that the stock markets all over the world surged to record levels on those days. The CARs for Canadian banks are positive and significant till day 3 and again from day 8 to day 10. They do not change sign during the 10 days. These results suggest that the Mexican moratorium announcement has no impact on Canadian bank stock prices.

Tables 7.2 and 7.4 show the distributional properties of the market model residuals for the British and Canadian banks respectively. All the five U.K. banks exhibit non-normality as indicated by significant D-statistics. Both skewness and kurtosis are significant in all the cases. In contrast, only one Canadian stock out of the six exhibit non-normality.

Leptokurtois is observed in two stocks. Tables 7.3 and 7.5 report the maximum likelihood estimates of GARCH(p,q) market model for the British and Canadian banks respectively. In general, for both the U.K. banks and the Canadian banks, Student t-distribution seem to fit in cases where the OLS model is not appropriate.

Table 7.6 shows the average excess returns and daily conditional variance for U.K. and Canadian banks with GARCH estimation method. The results are, in general, similar to those with the OLS method except for a few cases. Thus, for the U.K. banks, the average excess returns on day -1 and day +4 are significant (t = 2.35, and 2.13) with the GARCH model and insignificant with the OLS model. For the Canadian banks, the significance levels on day -2 are different. The conditional variance jumped up around the event period. The average beta with GARCH model is smaller than the OLS beta by about 11% for the British banks and by 10% for the Canadian banks. As in the case of the U.S. banks, the GARCH model does not make significant difference from the OLS model for the U.K. and Canadian banks also.

__Argentinean Moratorium__

Results from Table 7.1 (day +10 is the event day) indicate that the event has no impact on both the U.K. and the Canadian banks. One possible reason in the case of British banks may be that the market already discounted the Argentinean debt. England was involved in a war with

Argentina over Falklands from April 1982 to June 1982. Immediately after the commencement of the war (on April 3, 1982), the British government imposed economic sanctions and froze Argentine deposits in London banks. Thus, it is possible that the stock market has discounted the Argentinean debt during the Falkland war period.

Bolivian Moratorium

The results for the Bolivian moratorium event, shown in Table 7.7, indicate that the U.K. banks have average excess returns of -1.78% (t = -2.27) on day -1 and -1.17% (t = -1.79) on day 0, for a two-day return of -2.95% (t = -2.87). Thus, the announcement of Bolivian moratorium has considerable effect on the U.K. banks. The earlier premise that the market treated the Bolivian moratorium as an indication of deeper malaise with the entire Latin American loan portfolio seems to hold in the case of the British banks also.

The Canadian banks failed to follow the above pattern. Results indicate that these banks have positive excess returns on day -1, and negative excess returns on day 0, both being insignificant at the conventional 5% level. The two-day returns are positive, but not significantly different from zero. The CARs are insignificant throughout. Thus, the Bolivian moratorium, like the Mexican moratorium, has no information content for the Canadian bank stocks. The average residual variance and the beta of the portfolio at the time of the Bolivian moratorium decreased as compared to the Mexican

moratorium (for the U.S. and U.K. banks there is an increase in these variables).

Brazilian Moratorium

The Brazilian moratorium announcement resulted in average excess returns of -1.46% (t = -2.10) on day -1 and -0.96% (t = -1.51) on day 0 for the U.K. banks (Table 7.8). Thus, the two-day excess returns add up to -2.42% (t = -2.58) and are similar in magnitude (-2.88%) for the high exposure group of U.S. banks. All the CARs are significant, indicating that the moratorium has a lasting effect on the stocks. The beta of the portfolio has almost doubled as compared to the Mexican event.

The Brazilian moratorium has the most severe effect on the Canadian bank stocks. The excess returns on day - 1 and day 0 correspond to -4.05% (t = -8.39) and -3.58% (t = -7.49), respectively. Thus, in two days the Canadian bank stocks lost 7.62% of their market value. The CARs are highly negative and significant till day 3. They rise up to -11.70%. The beta of the portfolio increased by more than 50% from the Mexican moratorium event. The intensity of the reaction of Canadian bank stocks to the Brazilian announcement is in contrast to that observed for the U.S. and U.K. bank stocks. The effect on Canadian banks (in terms of excess returns and the t-statistics) for the Brazilian moratorium is the most severe of all the events analyzed in this study.

2. Lender-induced Events

Citicorp Loan-Loss-Provision Event

The Citicorp decision to enhance the loan-loss-provision on Third World debt seems to have a stronger effect on the British banks than on the U.S. banks. The event study results, reported in Table 7.9, show that the U.K. banks have average excess returns of 3.26% (t = 4.17) on the event day, and -4.12% (t = -5.73) and -2.46% (t = -3.40) on the next two days. This is in contrast to the experience of the Citicorp which has negative, but insignificant excess returns on day 0, and positive and significant excess returns of about 10% on day 1 and day 2.

Initially, the market reacted favorably to the Citicorp decision. The day after Citicorp's announcement, the Bank of England urged British banks to step up their reserves for Third World loans. The U.K. banks have loan-loss-reserves of about 5% - 10% of their Third World debt, insignificant compared to 30%-40% of reserves provided by big German, Swiss and French banks. The additional provisions needed would wipe out almost the entire pre-tax earnings of the British banks.

Although the importance of loan-loss-provision is confined only to accounting adjustments, it has implications for tax deductibility in the case of the U.K. banks. British tax rules permit banks to deduct loan loss provisions against their income taxes. British tax officials informally set these levels on a case-by-case and country-by-country basis.

The loan-loss-provision event has no effect on the Canadian bank stocks. The excess returns on day 0 and day 1 are negative, but not significant. A possible explanation is that the market treated the announcement as a firm-specific event, as in the case of the U.S. banks.

3. Events Initiated by Borrower and Lender

Mexican Debt-Rescheduling Agreement

The debt-rescheduling agreement between Mexico and the creditor banks resulted in excess returns of -2.03% (t = -2.39) on day -1, and insignificant negative excess returns on day 0 for the U.K. banks (Table 7.10). The two-day (day -1 and day 0) excess returns amount to -2.62% (t = -2.25). These results are similar to those observed for the U.S. banks with Latin American loans. Thus, the market treated the debt-rescheduling agreement as unfavorable to the banks.

But, the Canadian stock market treated the agreement as a non-event as shown by the insignificant excess returns for the Canadian banks. In fact, the excess returns are positive, though not significant, on day 0 and day 1. The CARs are also not statistically significant. Again, the Canadian banks show a pattern different from that of the U.S. and the U.K. banks.

4. External Events

Falkland War

The results of the Falkland War event, shown in Table

7.11, indicate insignificant excess returns on the event day and positive and significant excess returns of 1.92% (t = 3.21) on the following day for the British banks. The CARs are positive, and significant till day +2. The impact of Falkland war event on British bank stocks is exactly opposite to that of the reaction of U.S. bank stocks. It should be noted that England is one of the parties in the Falkland war. A negative event like devaluation of peso by Argentina would be good news to London stock market resulting in positive excess returns for the U.K. bank stocks.

The excess returns and the CARs for the Canadian banks are negative, but insignificant. Thus, the Falkland war event did not impact the Canadian bank stocks, unlike for the U.S. bank stocks with Latin American loan portfolio.

Cartagena Declaration

The results of the Cartagena declaration event, shown in Table 7.12, indicate that the event has no impact on both the British and the Canadian banks. The U.S. banks experienced slight positive excess returns. Thus, the Cartagena declaration event was perceived as a political event by all the markets.

Peru's Declaration

As shown in Table 7.13, the U.K. banks have insignificant excess returns on the event day. The CARs are also insignificant. Thus, the U.K. market, like the U.S. market, treated the declaration by the President of Peru limiting his

country's payments to 10% of export earnings as a political statement.

The Canadian market treated the event differently. The Canadian banks have average excess returns of -1.37% (t = -2.74) on the event day. The excess returns on day -1 and day +1 are not significant. The CARs are also negative, but insignificant.

Baker Plan

The results for the Baker Plan event, reported in Table 7.14, indicate positive and insignificant excess returns for the U.K. banks around the event day. For the Canadian banks, the excess returns on the event day are negative and insignificant on day 0. However, on day +1, the banks have negative excess returns of -1.65% (t = -3.66). The CARs are negative and significant till day 3. In contrast, the U.S. banks have positive excess returns following the announcement of Baker plan. Thus, there are three different responses from three markets for the same event: positive from the U.S., negative from the Canadian, and indifferent from the U.K.

Oil Price Slump

The event study results of oil price slump event are shown in Table 7.15. There is no impact of the event on the British bank stocks. In contrast, the Canadian banks have average excess returns of -2.11% (t = -4.89) on day 0. This result is close to the excess returns (-1.94%) experienced by the high exposure group of the U.S. banks.

The event study results for the set of all exposed U.S. banks, U.K. banks, and Canadian banks are summarized in Table 7.16. The results for the U.S. and the U.K. banks are, in general, similar whereas Canadian banks are somewhat different. The Mexican and the Bolivian moratoria have significant negative impact on U.S. and U.K. banks and no effect on the Canadian banks. Although the average excess returns in case of the Brazilian moratorium are significantly negative for all the three groups, the Canadian banks experienced predominantly higher excess returns: nearly six times that of the U.S. banks and three times that of the British banks. The only lender-induced event, Citicorp loan-loss-provision event, was treated as a firm-specific event by the U.S. and the Canadian banks and as an industry-wide event by the U.K. banks. The borrower-lender joint event, the debt-rescheduling agreement event, produced significant negative excess returns for the U.S. and the U.K. banks and positive, but insignificant excess returns for the Canadian banks. The Baker plan event was treated as favorable by the U.S. and the U.K. banks and unfavorable by the Canadian banks, although the excess returns are significant only in the case of the U.S. banks. Peru's declaration event has no information content for the U.S. and the U.K. banks, but it resulted in significant negative excess returns for the Canadian banks.

Thus, the results for the Canadian banks emerge as somewhat different from the other two sets of banks. However,

these results should be interpreted with caution due to the small sample sizes of the British and the Canadian banks. Some possible explanations for the different pattern of results obtained for the Canadian banks are examined in the next section.

B. Excess Returns: The Case of Canadian Banks

Three possible explanations are examined for the dissimilar results obtained for the Canadian banks. The first explanation is that the Canadian stock markets are not efficient. However, the Toronto and the Montreal stock exchanges on which these banks are listed are well developed and there is no reason to suspect that these markets are inefficient. Moreover, the six banks in the sample are the largest banks in Canada and they account for more than 90% of total Canadian bank assets. Hence, these stocks are closely monitored by analysts.

The second explanation relates to capital regulation. Although the primary capital ratios (base capital ratios) for Canadian banks are not large (around 3% to 4% in 1982) compared to those of the big U.S. banks, it should be noted that capital regulation in Canada is rather conservative (see Chapter 3). Hence, the Canadian banks seem to be better capitalized than what the base capital ratios indicate.

The third explanation is that the investor reaction is reflected in the volume of shares traded. The volume of

shares traded for the six banks around the Mexican moratorium and the Bolivian moratorium events are shown in Tables 7.17 and 7.18, respectively. It can be seen from Table 7.17 that from day -2 to day -1 there is an abrupt increase in volume. From day -1 to day 0, the volume dropped steeply.[1] Similar steep changes in volume around the event day are observed for other events also.

Volume reaction is related to change in expectations of individual investors around the events. Beaver (1968) argues that price reaction reflects changes in expectations of the market as a whole while volume reaction reflects changes in the expectations of individual investors. Beaver notes that volume reflects a lack of consensus regarding the price and the lack of consensus is induced by a piece of new information. If risk preferences differ, there could be a volume reaction, even after the equilibrium price had been reached. A piece of information may be neutral in the sense of not changing the expectations of the market as a whole but it may greatly alter the expectations of individuals. In that case, there would be no price reaction, but there could be shifts in portfolio positions as reflected in volume.

Thus, a piece of information can result in change of price or volume or both. In the case of the Canadian banks, there is change in volume for all the events, but the price

[1]Significant changes in volume around the Mexican moratorium event are observed for the U.S. banks also.

change is observed in only a few cases. This raises the question of the adequacy of the definition of an 'event'. Since an event conveys information to the market about the stocks, it may result in change of price or volume or both. Most of the event studies in finance literature concentrated on price change. In view of the evidence presented here, a much broader definition of an event is warranted, one which involves changes in price or volume or both.

C. Chapter Summary

This chapter extends the analysis of events to the British and Canadian banks. The results for the U.S. and the U.K. banks are in general similar for major events like the moratoria. However, the results for the Canadian banks are somewhat different. The excess returns for most of the events are insignificant for the Canadian banks, but abrupt shifts in volume of shares traded around the event dates are observed. Hence, it may be concluded that Canadian stock market reaction to the events studied resulted mainly in shifts in trading volume.

Table 7.1

Excess Returns and Cumulative Excess Returns for British and Canadian Banks around Mexican Moratorium Event (Event Date 820819)

Day	U.K. Banks	Canadian Banks
Panel A: Daily Average Excess Returns		
-3	-0.0367	0.0005
	(-5.24)**	(0.08)
-2	0.0209	0.0145
	(3.01)**	(2.04)*
-1	0.0130	0.0340
	(1.91)	(4.29)**
0	**-0.0152**	**-0.0014**
	(-2.15)*	**(-0.56)**
1	0.0000	0.0130
	(-0.02)	(1.80)
2	-0.0071	-0.0048
	(-1.04)	(-0.59)
3	-0.0030	0.0055
	(-0.47)	(0.10)
4	-0.0102	-0.0131
	(-1.55)	(-2.22)*
5	-0.0071	-0.0127
	(-1.04)	(-1.67)
6	-0.0024	0.0160
	(-0.30)	(2.77)**
7	-0.0005	0.0023
	(-0.08)	(0.32)
8	-0.0010	0.0289
	(-0.25)	(5.63)**
9	0.0199	0.0070
	(2.96)**	(0.89)
10@	**-0.0001**	**-0.0051**
	(-0.01)	**(-0.42)**

Table 7.1 (contd.)

	U.K. Banks	Canadian Banks
Panel B: Cumulative Average Excess Returns		
-1 0	-0.0022	0.0326
	(-0.17)	(2.64)**
-1 +1	-0.0022	0.0456
	(-0.15)	(3.19)**
-1 +2	-0.0093	0.0408
	(-0.65)	(2.47)*
-1 +3	-0.0123	0.0463
	(-0.79)	(2.25)*
-1 +4	-0.0225	0.0332
	(-1.36)	(1.15)
-1 +5	-0.0297	0.0206
	(-1.65)	(0.43)
-1 +6	-0.0320	0.0366
	(-1.65)	(1.39)
-1 +7	-0.0326	0.0389
	(-1.58)	(1.41)
-1 +8	-0.0335	0.0677
	(-1.58)	(3.12)**
-1 +9	-0.0137	0.0748
	(-0.61)	(3.24)**
-1 +10	-0.0138	0.0697
	(-0.59)	(2.98)**
N	5	6
Avg res var('000)	0.2379	0.3136
Beta	0.5393	0.7677

t-statistics in parentheses
* Significant at 5% level
** Significant at 1% level
Estimation Period (t = -260 to t = -11)
@ Day of rumor of Argentinean default of debt

Table 7.2

Descriptive Statistics of Market Model Residuals for British Banks Using Ordinary Least Squares Method (250 Days before Mexican Moratorium)

Symbol	D-Stat (P)	Mean	Variance ('000)	Skewness (P)	Kurtosis (P)	D-W Stat	Market Model Parameters (a) (t)	(b) (t)
BAR	0.131 (0.01)	0.00	0.2624	-2.271 (0.00)	20.11 (0.00)	2.269	0.0003 (0.27)	0.63 (8.31)
LLY	0.103 (0.01)	0.00	0.2434	1.890 (0.00)	15.81 (0.00)	1.998	0.0004 (0.45)	0.54 (7.44)
MID	0.088 (0.01)	0.00	0.2890	0.519 (0.00)	5.76 (0.00)	2.287	0.0006 (0.58)	0.63 (7.98)
NAT	0.096 (0.01)	0.00	0.1993	0.882 (0.00)	6.95 (0.00)	2.149	0.0008 (0.92)	0.56 (8.60)
STD	0.101 (0.01)	0.00	0.1881	0.907 (0.00)	9.49 (0.00)	1.861	0.0005 (0.53)	0.34 (5.35)

BAR = Barclays Bank
LLY = Lloyds Bank
MID = Midland Bank
NAT = National Westminster Bank
STD = Standard Chartered Bank

P = p-value
t = t-statistics
D-Stat = Kolmogorov-Smirnov D-Statistics for normality
D-W Stat = Durbin-Watson Statistics

Table 7.3

Maximum Likelihood Estimates of GARCH Market Model for British Banks around Mexican Moratorium Event

	Symbol	Market Model Parameters a	b	ω ('000)	α_1	β_1	$\alpha_1+\beta_1$	Model	$1/\nu$
1.	BAR	0.0004 (0.6)	0.65 (14.1)	0.1700 (4.21)	0.1935 (1.19)	-	0.1935	ARCH(t)	-
2.	LLY	-0.0002 (-0.3)	0.61 (11.3)	0.2600 (2.96)	-	-	-	OLS	-
3.	MID	0.0002 (0.3)	0.70 (11.6)	0.3100 (3.77)	-	-	-	OLS	-
4.	NAT	0.0009 (1.3)	0.63 (12.8)	0.2200 (3.03)	-	-	-	OLS	-
5.	STD	-0.0003 (-0.5)	0.30 (6.4)	0.0100 (0.85)	0.0529 (1.63)	0.9293 (20.9)	0.9822	GARCH(t)	0.1570 (2.77)

t-statistics in parentheses

Table 7.4

Descriptive Statistics of Market Model Residuals for Canadian Banks Using Ordinary Least Squares Method (250 Days before Mexican Moratorium)

Symbol	D-Stat (P)	Mean	Variance ('000)	Skewness (P)	Kurtosis (P)	D-W Stat	Market Model Parameters a (t)	b (t)
BNS	0.04 (.20)	0.00	0.0002	-0.166 (.28)	0.10 (.76)	2.016	0.0001 (0.04)	0.56 (5.7)
BOM	0.04 (.20)	0.00	0.0002	0.183 (.23)	0.97 (.97)	2.308	-0.0009 (-1.06)	0.79 (7.8)
CIC	0.05 (.15)	0.00	0.0002	-0.179 (.24)	0.37 (.23)	2.201	-0.0008 (-0.99)	0.76 (8.1)
NBC	0.09 (.01)	0.00	0.0009	-1.858 (.00)	18.2 (.00)	1.841	-0.0023 (-1.24)	0.76 (3.6)
RBC	0.03 (.20)	0.00	0.0002	0.074 (.63)	-0.11 (.72)	2.000	-0.0001 (-0.13)	0.98 (9.6)
TDB	0.04 (.20)	0.00	0.0002	-0.282 (.07)	0.95 (.00)	1.920	0.0001 (0.15)	0.76 (7.4)

BOM = Bank of Montreal
BNS = Bank of Nova Scotia
CIC = Canadian Imperial Bank of Commerce
NBC = National Bank of Canada
RBC = Royal Bank of Canada
TDB = Toronto Dominion Bank

P = p-value
t = t-statistics
D-Stat = Kolmogorov-Smirnov D-statistics for normality
D-W Stat = Durbin-Watson Statistics

Table 7.5

Maximum Likelihood Estimates of GARCH Market Model for Canadian Banks around Mexican Moratorium Event

	Symbol	Market Model Parameters a	b	ω ('000)	α_1	β_1	$\alpha_1+\beta_1$	Model	$1/\nu$
1.	BNS	0.0001	0.5855	-	-	-	-	OLS	-
		(0.08)	(6.27)						
2.	BOM	-0.0009	0.7232	0.0001	0.2815	-	0.2815	ARCH(t)	0.14
		(-1.14)	(7.79)	(6.83)	(1.81)				(2.1)
3.	CIC	-0.0008	0.7521	0.0001	0.1977	-	0.1977	ARCH(N)	-
		(-0.96)	(9.13)	(8.38)	(2.11)				
4.	NBC	-0.0010	0.8129	0.0002	0.2542	0.5184	0.7726	GARCH(t)	0.28
		(-0.78)	(5.96)	(1.82)	(1.62)	(2.58)			(13.5)
5.	RBC	-0.0002	0.9566	-	-	-	-	OLS	-
		(-0.20)	(10.1)						
6.	TDB	0.0001	0.7523	-	-	-	-	OLS	-
		(0.16)	(8.84)						

t-statistics in parentheses

Table 7.6

Average Excess Returns and Conditional Variance for British and Canadian Banks around Mexican Moratorium Event Using GARCH Model (Event Date 820819)

Day	U.K. Banks		Canadian Banks	
	AR (ϵ_t)	VAR (h_t) ('000)	AR (ϵ_t)	VAR (h_t) ('000)
-3	-0.0360 (-5.01)**	0.289	0.0012 (0.02)	0.359
-2	0.0216 (2.71)**	0.312	0.0135 (2.59)**	0.376
-1	0.0136 (2.35)*	0.375	0.0323 (3.17)**	0.431
0	**-0.0154 (-2.35)***	**0.386**	**-0.0019 (-0.79)**	**0.459**
1	0.0002 (-0.05)	0.395	0.0146 (2.35)*	0.473
2	-0.0061 (-1.27)	0.399	-0.0044 (-0.51)	0.485
3	-0.0031 (-0.39)	0.387	0.0048 (0.01)	0.498
4	-0.0109 (-2.13)*	0.379	-0.0124 (-1.83)	0.476
5	-0.0076 (-1.21)	0.361	-0.0125 (-1.99)*	0.462
6	-0.0022 (-0.36)	0.347	0.0154 (2.65)**	0.449
7	-0.0013 (-0.28)	0.323	0.0016 (0.28)	0.419
8	-0.0017 (-0.14)	0.312	0.0267 (4.39)**	0.396
9	0.0187 (2.76)**	0.301	0.0077 (0.78)	0.368
10@	**-0.0011 (-0.26)**	**0.281**	**-0.0058 (-0.22)**	**0.348**
N	5		6	
Avg. beta	0.4782		0.6893	

t-statistics in parentheses
* Significant at 5% level
** Significant at 1% level
Estimation Period (t = -260 to t = -11)

Table 7.7

Excess Returns and Cumulative Excess Returns for British and Canadian Banks around Bolivian Moratorium Event
(Event Date 840531)

Day	U.K. Banks	Canadian Banks
Panel A: Daily Average Excess Returns		
-3	0.0000	0.0230
	(-0.01)	(4.77)**
-2	0.0085	0.0440
	(1.07)	(9.03)**
-1	-0.0178	0.0087
	(-2.27)*	(1.94)
0	**-0.0117**	**-0.0058**
	(-1.79)	**(-1.00)**
1	0.0034	0.0037
	(0.25)	(0.54)
2	0.0165	0.0081
	(2.20)*	(1.48)
3	-0.0177	-0.0077
	(-2.71)**	(-1.46)
Panel B: Cumulative Average Excess Returns		
-1 0	-0.0295	0.0029
	(-2.87)**	(0.67)
-1 +1	-0.0261	0.0066
	(-2.20)*	(0.85)
-1 +2	-0.0097	0.0147
	(-0.81)	(1.48)
-1 +3	-0.0273	0.0070
	(-1.93)	(0.67)
N	5	6
Avg res var('000)	0.2852	0.1443
Beta	0.5663	0.6689

t-statistics in parentheses
* Significant at 5% level
** Significant at 1% level
Estimation Period (t = -260 to t = -11)

Table 7.8

Excess Returns and Cumulative Excess Returns for British and Canadian Banks around Brazilian Moratorium Event (Event Date 870223)

Day	U.K. Banks	Canadian Banks
Panel A: Daily Average Excess Returns		
-3	-0.0021	0.0163
	(-0.17)	(3.08)**
-2	-0.0117	-0.0027
	(-1.39)	(-0.61)
-1	-0.0146	-0.0405
	(-2.10)*	(-8.39)**
0	**-0.0096**	**-0.0358**
	(-1.51)	**(-7.49)****
1	-0.0041	-0.0053
	(-0.57)	(-1.26)
2	-0.0355	-0.0356
	(-4.59)**	(-7.57)**
3	-0.0145	0.0224
	(-2.09)*	(4.66)**
Panel B: Cumulative Average Excess Returns		
-1 0	-0.0242	-0.0762
	(-2.58)**	(-11.22)**
-1 +1	-0.0284	-0.0815
	(-2.42)*	(-9.89)**
-1 +2	-0.0639	-0.1170
	(-4.39)**	(-12.35)**
-1 +3	-0.0783	-0.0946
	(-4.86)**	(-8.96)**
N	5	6
Avg res var('000)	0.3815	0.1413
Beta	0.9787	1.1982

t-statistics in parentheses
* Significant at 5% level
** Significant at 1% level
Estimation Period (t = -260 to t = -11)

Table 7.9

Excess Returns and Cumulative Excess Returns for British and Canadian Banks around Citicorp Loan-Loss Provision Event (Event Date 870519)

Day	U.K. Banks	Canadian Banks
Panel A: Daily Average Excess Returns		
-3	-0.0014	-0.0017
	(-0.33)	(-0.28)
-2	0.0150	0.0004
	(1.61)	(-0.01)
-1	0.0120	-0.0115
	(1.59)	(-2.40)*
0	**0.0326**	**-0.0089**
	(4.17)**	**(-1.93)**
1	-0.0412	-0.0046
	(-5.73)**	(-0.83)
2	-0.0246	0.0046
	(-3.40)**	(0.93)
3	0.0032	-0.0053
	(0.56)	(-1.09)
Panel B: Cumulative Average Excess Returns		
-1 0	0.0446	-0.0205
	(4.08)**	(-3.06)**
-1 +1	0.0035	-0.0251
	(0.02)	(-2.98)**
-1 +2	-0.0211	-0.0204
	(-1.68)	(-2.12)*
-1 +3	-0.0180	-0.0258
	(-1.26)	(-2.38)*
N	5	6
Avg res var('000)	0.3315	0.1445
Beta	0.5015	0.9574

t-statistics in parentheses
* Significant at 5% level
** Significant at 1% level
Estimation Period (t = -260 to t = -11)

Table 7.10

Excess Returns and Cumulative Excess Returns for British and Canadian Banks around Mexican Debt-Rescheduling Event (Event Date 860930)

Day	U.K. Banks	Canadian Banks
Panel A: Daily Average Excess Returns		
-3	0.0016	0.0029
	(0.18)	(0.63)
-2	-0.0016	0.0051
	(-0.11)	(0.97)
-1	-0.0203	-0.0061
	(-2.39)*	(-1.14)
0	**-0.0059**	**0.0082**
	(-0.80)	**(1.67)**
1	-0.0068	0.0053
	(-0.85)	(1.00)
2	-0.0054	-0.0094
	(-0.76)	(-1.83)
3	0.0033	-0.0022
	(0.49)	(-0.46)
Panel B: Cumulative Average Excess Returns		
-1 0	-0.0262	0.0021
	(-2.25)*	(0.37)
-1 +1	-0.0330	0.0073
	(-2.33)*	(0.89)
-1 +2	-0.0384	-0.0020
	(-2.40)*	(-0.15)
-1 +3	-0.0352	-0.0043
	(-1.93)	(-0.34)
N	5	6
Avg res var('000)	0.3935	0.1564
Beta	0.9630	1.1802

t-statistics in parentheses
* Significant at 5% level
** Significant at 1% level
Estimation Period (t = -260 to t = -11)

Table 7.11

Excess Returns and Cumulative Excess Returns for British and Canadian Banks around Falkland War Event (Event Date 820505)

Day	U.K. Banks	Canadian Banks
Panel A: Daily Average Excess Returns		
-3	-0.0078	0.0145
	(-1.16)	(2.45)*
-2	-0.0010	0.0001
	(-0.15)	(0.07)
-1	0.0092	-0.0086
	(1.46)	(-1.42)
0	**0.0018**	**-0.0046**
	(0.37)	**(-1.13)**
1	0.0192	-0.0029
	(3.21)**	(-0.58)
2	-0.0036	0.0071
	(-0.70)	(1.31)
3	-0.0057	-0.0082
	(-0.91)	(-1.55)
Panel B: Cumulative Average Excess Returns		
-1 0	0.0111	-0.0132
	(1.29)	(-1.80)
-1 +1	0.0303	-0.0161
	(2.91)**	(-1.80)
-1 +2	0.0266	-0.0090
	(2.17)*	(-0.91)
-1 +3	0.0209	-0.0172
	(1.54)	(-1.50)
N	5	6
Avg res var('000)	0.2136	0.2558
Beta	0.5560	0.6313

t-statistics in parentheses
* Significant at 5% level
** Significant at 1% level
Estimation Period (t = -260 to t = -11)

Table 7.12

Excess Returns and Cumulative Excess Returns for British and Canadian Banks around Cartagena Declaration Event (Event Date 840621)

Day	U.K. Banks	Canadian Banks
Panel A: Daily Average Excess Returns		
-3	-0.0136	0.0050
	(-1.99)*	(0.85)
-2	0.0025	-0.0067
	(0.16)	(-1.37)
-1	0.0000	0.0011
	(0.14)	(0.28)
0	**0.0040**	**0.0065**
	(0.48)	**(1.12)**
1	-0.0016	-0.0053
	(-0.02)	(-0.89)
2	-0.0014	0.0014
	(-0.24)	(0.39)
3	0.0014	-0.0008
	(0.35)	(-0.14)
Panel B: Cumulative Average Excess Returns		
-1 0	0.0040	0.0076
	(0.44)	(0.99)
-1 +1	0.0023	0.0024
	(0.35)	(0.30)
-1 +2	0.0009	0.0037
	(0.18)	(0.45)
-1 +3	0.0023	0.0029
	(0.32)	(0.34)
N	5	6
Avg res var('000)	0.2956	0.1566
Beta	0.6269	0.7000

t-statistics in parentheses
* Significant at 5% level
** Significant at 1% level
Estimation Period (t = -260 to t = -11)

Table 7.13

Excess Returns and Cumulative Excess Returns for British and Canadian Banks around Peru's Declaration Event (Event Date 850729)

Day	U.K. Banks	Canadian Banks
Panel A: Daily Average Excess Returns		
-3	-0.0033	-0.0028
	(-0.56)	(-0.64)
-2	0.0032	-0.0133
	(0.11)	(-2.58)**
-1	0.0182	0.0019
	(2.08)*	(0.43)
0	**-0.0002**	**-0.0137**
	(0.19)	**(-2.74)****
1	-0.0256	-0.0077
	(-2.63)**	(-1.36)
2	-0.0057	-0.0003
	(-0.61)	(-0.12)
3	-0.0516	0.0135
	(-4.68)**	(2.62)**
Panel B: Cumulative Average Excess Returns		
-1 0	0.0180	-0.0118
	(1.60)	(-1.64)
-1 +1	-0.0076	-0.0195
	(-0.21)	(-2.12)*
-1 +2	-0.0133	-0.0198
	(-0.49)	(-1.90)
-1 +3	-0.0649	-0.0064
	(-2.53)*	(-0.53)
N	5	6
Avg res var('000)	0.4577	0.1608
Beta	0.5238	0.2611

t-statistics in parentheses
* Significant at 5% level
** Significant at 1% level
Estimation Period (t = -260 to t = -11)

Table 7.14

Excess Returns and Cumulative Excess Returns for British and Canadian Banks around Baker Plan Event (Event Date 851007)

Day	U.K. Banks	Canadian Banks
Panel A: Daily Average Excess Returns		
-3	-0.0054	-0.0056
	(-0.85)	(-1.04)
-2	0.0170	-0.0005
	(2.47)*	(-0.05)
-1	0.0158	0.0023
	(1.57)	(0.35)
0	**0.0064**	**-0.0078**
	(1.05)	**(-1.44)**
1	0.0039	-0.0165
	(0.51)	(-3.66)**
2	0.0120	-0.0048
	(1.44)	(-0.95)
3	-0.0028	-0.0064
	(-0.38)	(-1.36)
Panel B: Cumulative Average Excess Returns		
-1 0	0.0222	-0.0054
	(1.85)	(-0.77)
-1 +1	0.0261	-0.0219
	(1.81)	(-2.74)**
-1 +2	0.0381	-0.0268
	(2.28)*	(-2.85)**
-1 +3	0.0353	-0.0332
	(1.87)	(-3.16)**
N	5	6
Avg res var('000)	0.5344	0.1279
Beta	0.4975	0.1646

t-statistics in parentheses
* Significant at 5% level
** Significant at 1% level
Estimation Period (t = -260 to t = -11)

Table 7.15

Excess Returns and Cumulative Excess Returns for British and Canadian Banks around Oil Price Slump Event (Event Date 860204)

Day	U.K. Banks	Canadian Banks
Panel A: Daily Average Excess Returns		
-3	0.0043	-0.0039
	(0.30)	(-0.76)
-2	-0.0131	-0.0091
	(-1.72)	(-2.11)*
-1	-0.0113	0.0028
	(-1.13)	(0.56)
0	**0.0063**	**-0.0211**
	(0.44)	**(-4.89)****
1	-0.0092	0.0063
	(-0.99)	(1.53)
2	0.0035	0.0111
	(0.26)	(2.46)*
3	0.0469	-0.0135
	(6.97)**	(-3.29)**
Panel B: Cumulative Average Excess Returns		
-1 0	-0.0113	-0.0183
	(-1.13)	(-3.07)**
-1 +1	-0.0142	-0.0120
	(-0.97)	(-1.62)
-1 +2	-0.0107	-0.0009
	(-0.71)	(-0.17)
-1 +3	0.0362	-0.0144
	(2.49)*	(-1.63)
N	5	6
Avg res var('000)	0.4901	0.1174
Beta	0.4934	0.8316

t-statistics in parentheses
* Significant at 5% level
** Significant at 1% level
Estimation Period (t = -260 to t = -11)

Table 7.16

Summary of Event-Day Average Excess Returns for U.S., U.K., and Canadian Banks

Event (Event date)	U.S. Banks	U.K. Banks	Canadian Banks
1. Mexican moratorium (08/19/82)	-0.0177 (-7.70)**	-0.0152 (-2.15)*	-0.0014 (-0.56)
2. Argentinean moratorium (09/02/82)	-0.0072 (-2.70)**	-0.0001 (-0.01)	-0.0051 (-0.42)
3. Bolivian moratorium (05/31/84)	-0.0112 (-3.53)**	-0.0295 (-2.87)**	0.0029 (0.67)
4. Brazilian moratorium (02/23/87)	-0.0135 (-4.08)**	-0.0242 (-2.58)**	-0.0762 (-11.22)**
5. Citicorp loan loss (05/19/87)	-0.0024 (-1.32)	0.0326 (4.17)**	-0.0089 (-1.93)
6. Debt-Resch. agreement (09/30/86)	-0.0083 (-3.01)**	-0.0262 (-2.25)*	0.0082 (1.67)
7. Falkland War (05/05/82)	-0.0108 (-2.94)**	0.0111 (1.29)	-0.0132 (-1.80)
8. Cartagena meet (06/21/84)	0.0068 (3.08)**	0.0040 (0.48)	0.0065 (1.12)
9. Peru's declaration (07/29/85)	-0.0039 (-1.24)	-0.0002 (0.19)	-0.0137 (-2.74)**
10. Baker Plan (10/07/85)	0.0119 (3.50)**	0.0064 (1.05)	-0.0078 (-1.44)
11. Oil Price slump (02/04/86)	-0.0104 (-3.41)**	0.0063 (0.44)	-0.0211 (-4.89)**

t-statistics in parentheses
* Significant at 5% level; ** Significant at 1% level

Table 7.17

Volume of Shares Traded for Canadian Banks around Mexican Moratorium Event

Day	Volume of Shares ('000)					
	BOM	BNS	CIC	NBC	RBC	TDB
-2	54.3	51.9	16.8	17.2	51.1	155.5
-1	122.5	323.4	137.8	19.6	130.0	395.4
0	80.5	114.3	50.0	69.0	32.3	234.0
+1	8.8	226.2	37.2	15.0	31.5	156.0
+2	45.8	108.9	41.4	4.4	152.6	422.4

Table 7.18

Volume of Shares Traded for Canadian Banks around Bolivian Moratorium Event

Day	Volume of Shares ('000)					
	BOM	BNS	CIC	NBC	RBC	TDB
−2	106.3	122.5	82.6	13.2	128.2	171.6
−1	90.8	89.7	92.8	9.0	67.6	91.8
0	32.4	83.4	23.0	5.8	48.8	17.8
+1	50.2	50.6	23.0	7.6	41.5	134.0
+2	42.3	123.2	32.2	79.2	79.9	133.6

CHAPTER 8

SUMMARY, CONCLUSIONS, AND FUTURE RESEARCH

This dissertation analyzed the impact of twelve events related to Latin American debt crisis on the market value of the U.S, U.K, and Canadian bank stocks. The literature was extended in several directions. First, different types of events and several events of the same type were examined to enhance the generality of the conclusions. Second, a general theoretical framework involving two testable hypotheses was utilized to interpret the economic significance of the events. Third, the capital regulation hypothesis was tested extensively and it helped to clarify some of the ambiguities presented by earlier literature on the Mexican moratorium event. Fourth, the GARCH model was used to address some of the problems associated with the OLS market model. These include nonnormalities, nonlinearities, and heteroscedasticity, and Cornell and Shapiro's criticism against use of event study methods for studying the impact of the debt crisis. Finally, the international dimension of the Latin American problem is recognized by extending the analysis to the British and the Canadian banks.

The topic was introduced in Chapter 1 while Chapter 2 contained a review of literature on Latin American debt problem. In Chapter 3, twelve events were identified for

detailed study. The events were selected in such a way that they encompass the unique features of the Latin debt problem. A brief description of each event and its hypothesized impact on stock prices were provided. The chapter also contained description of the sample of the U.S., U.K. and Canadian banks.

In Chapter 4, two hypotheses, the new information hypothesis and the capital regulation hypothesis, were proposed as a general framework to explain the significance of the excess returns around each event. The deficiencies in the OLS market model, namely, nonnormalities, nonlinearities, and heteroscedasticity, and the criticism of Cornell and Shapiro against use of standard event study method in the case of Latin American debt crisis were discussed. The GARCH model was proposed to address the inadequacies of the OLS model.

In Chapter 5, the event study results using the OLS and the GARCH models were presented. The events for which the event-day excess returns were found to be significant were analyzed further in Chapter 6 to test the hypotheses. In Chapter 7, the analysis was extended to the U.K. and the Canadian banks to exploit the international dimension of the problem.

Before discussing the results, some limitations of this study may be noted. First, the event dates are perfectly clustered, which, in effect, means that the sample size for any event is only one. However, this drawback is overcome, to

some extent, by analyzing a number of events of the same type (e.g., the four moratoria). Second, the beta of the stocks is assumed to be constant in the GARCH model, whereas the beta is found to change when the risk characteristics of the sample are analyzed. Hence, as noted later in this chapter, both beta and variance should be allowed to vary. Finally, the results of the U.K. and the Canadian bank stocks should be interpreted with caution because of the very small sample sizes.

The results of this study indicate that most of the events produced significant event-day excess returns for the group of U.S. banks with Latin American loans. The market distinguished banks broadly as high-, medium-, and zero-exposure groups. The four moratoria as a class, produced strong and consistent results. However, tests suggest that the underlying dynamics of the moratoria differ, although the event period excess returns are similar. The results also clarify some of the ambiguities presented by earlier literature on the Mexican moratorium event. This study provides perspective on the economic impact of capital regulation and clarifies the link between external exogenous events and bank value.

The results of the GARCH model indicate that the variance correction does not make a significant difference in tests of hypotheses. However, it is useful to test the GARCH model in other types of studies and different data sets. In this study

the dynamic patterns of the conditional variances and the betas have not been modeled simultaneously. This study can be extended by employing multivariate GARCH model which exploits the link between time-variation in beta and the time-varying conditional variance. Bollerslev et al. (1990) suggest that this model is more appropriate than an ARCH variance with a constant beta or beta process independent of the error variances.

The results for the British banks are, in general, similar to those for the U.S. banks for major events like the moratoria. However, the results for the Canadian banks differ somewhat from those for the U.S. banks. It is suggested in this study that the Canadian stock market reaction to the events resulted mainly in sharp changes in trading volume around the event dates. However, further research may be necessary for a more satisfactory explanation of the results for the Canadian bank stocks. Most of the money center banks of the U.S. are listed on the Montreal or Toronto stock exchanges. A useful extension of this study would involve analyzing the market reaction for the U.S. bank stocks listed in Canada. This may clarify whether the differences for the Canadian banks are caused by the market structure or the regulatory environment.

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