MEXICAN BANK'S STOCKS PERFORMANCE DURING THE BANKING PRIVATIZATION PROCESS (1990-1992)

by

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To the memory of my dear parents, Mercedes and Roberto

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I. INTRODUCTION

One of the first academic attempts to understand stock price behavior and investor rationality using mathematics and statistical analysis was the work of Markowitz [1959][1]. After exploring the concepts of Risk, Return and Diversification from a statistical perspective, Markowitz proposed using non-linear programming to optimize (minimizing risk, maximizing return) the combination of financial assets in a portfolio[2]. The rationality that supports modern finance theory is, in a significant measure, founded on Markowitz's insight of the investor's trade-off between risk and return.

Posterior developments that overcome the mathematical complexity of Markowitz's optimizing portfolio model, and result more adequate from the practitioner's perspective[3], represent the theoretical foundations to understand and

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[1]Markowitz´ original work on Portfolio theory was his Ph.D. Dissertation in 1952. The reference cited here corresponds to a monograph published by the author for the non-specialist some years later.

[2]Harry Markowitz shared the Nobel Memorial Prize in Economic Science with William Sharpe and Merton Miller in 1990 for his development of the so-called "Theory of Portfolio Choice" in the 1950´s.

[3]Such as the Capital Asset Pricing Model, the Market Model, and the Arbitrage Pricing Model.

evaluate the impact of information releases on the price of stocks. According to such developments, financial assets are expected to yield a level of return to holders that is adequate to compensate them for accepting different levels of risk.

Once the basic theoretical relationship between risk and return was established for an asset or a portfolio of assets the new concept of expected returns based on "equilibrium" models was born. Empirical testing of the exactness of the equilibrium model's predictions was followed by several authors, among which Black, Jensen and Scholes [1972], Fama and MacBeth [1974], Roll and Ross [1980] are recognized as classical studies on the subject.

The last two decades have witnessed the emergence of a whole new avenue of research that focuses on the interpretation of deviations of observed returns from equilibrium model's expected returns: the Event Study Methodology. An event study consists of the use of a market equilibrium return generating model to calculate the expected return that corresponds to a financial security, given its level of risk, and then compare it to the observed return. In the absence of external factors, expected and observed returns deviations should not be significantly different from zero. On the same line of argument, if there are relevant factors that affect the normal behavior of returns, a statistical test of the significance of the deviations can support the argument that such influences were incorporated on financial assets prices.

Event Study Methodology is theoretically supported by the Efficient Markets Hypothesis, whose central argument is that stock prices accurately reflect available information. ESM examines evidence on how fast and accurately stock prices adjust to new information, in order to establish the degree of efficiency of the market.

In other words, empirical testing of the EMH requires evaluating the statistical significance of the response of stock prices to different types of

information. If EMH holds, no opportunity to obtain extraordinary returns exists, and securities analysis does not provide any additional information elements to implement a successful trading strategy. On the other hand, if statistical tests implemented to evaluate the significance of deviations from expected returns contradict the assumptions of the EMH, the assertion that opportunities to obtain extraordinary returns existed, and trading strategies may well have been designed in order to obtain above average profits, gets empirical support.

Empirical studies performed in more advanced economies offer abundant empirical results that support the existence of efficient stock markets, with very few exceptions. Thus, the central interest of more recent research is related to the velocity and magnitude of response of stock prices, as well as calendar-related anomalies[4].

Emerging Markets are characterized by the intensity and volatility of their behavior. Wealth creation and destruction on a large scale represents daily experiences. That is why a study of the impact of information releases on stock prices represents an aspect of central importance for market participants in those, often times, turbulent trading environments. However, very few attempts to evaluate the efficiency of stock prices to incorporate information releases in emerging markets exist. From that perspective, a study of the impact that a release of information has on the price of publicly traded stocks contains attractive features for a dissertation theme. Several theoretical and practical implications can be derived.

The objective of the present dissertation is to provide a better understanding of the workings of the Mexican stock exchange by focusing on the

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[4]For example, the "January Effect", or the "Weekend Effect".(Tinic and West, 1984; Smirlock and Starks, 1986; French, 1980).

informational impact of government announcements regarding the different phases of the 1991-1992 bank privatization process.

The bank privatization process formed part of a profound and wide-ranging structural change promoted by the government to modernize the economy. During 1991 and 1992, official announcements referred to different aspects of the privatization process represent informational events that can be precisely located in time. Market price information for the banks' stock may then be statistically analyzed to measure the intensity of the information impact.

The banks' stock price behavior in response to relevant information releases during the privatization process represents a privileged experimental material to evaluate the potential for wealth creation and wealth destruction in the Mexican market. At the same time, bank stock prices efficiency to incorporate relevant information is also analyzed under the theoretical frame of the EMH. Both analyses are practiced here, based on statistical measurements and hypothesis tests.

At subsequent stages of the privatization process official announcements of different nature, which carried relevant informational content for the bank stocks market valuation, were released. Three informational event situations that offered the conditions to develop a detailed statistical study of the impact of official information releases on the banks stock market prices were selected: 1) the official announcement of the decision to privatize the Mexican banks, which had an intense positive effect on the banks stocks prices; 2) the official announcements of the sequence in which different groups of banks were to be auctioned; 3) and, finally, the auction results announcements themselves, which also had important informational impacts on the bank stock prices.

Throughout the Research Design (Chapter 3) and the Results Analysis (Chapter 4), the central objective of measuring the statistical significance of the

deviations of stock returns with respect to their "expected" values is followed by an effort to find an interpretative content of the results. Sometimes that interpretation belongs to the realm of the EMH, either to support or to seriously question the presence of efficient information mechanisms. At other times results reflect the importance to evaluate the presence of a high variability of abnormal returns (high abnormal returns variances) during the Market Model's estimation period, and the diversification effect of combining different stocks in one portfolio. In general, high variances of residuals are a factor that complicates the identification of important wealth creation or destruction effects, from a statistical hypothesis tests perspective. But diversification also represents the possibility to understate the wealth creation-destruction impact of information releases, as will be more extensively explained.

Among the attractive features of the subject of study is the fact that, at the moment of the privatization decision announcement, a representative proportion of the outstanding stock of fifteen out of eighteen commercial banks operating in the country were publicly traded. Thus, bank stock price variations are statistically analyzed to identify significant responses to official privatization announcements.

Another attractive aspect is the fact that bank stock prices were, at the time of the privatization decision announcement, among the most actively traded stocks in the Mexican stock exchange. Trading intensity was due, at least in part, to the high returns observed during previous years. For that reason, bank stock prices were closely monitored by several financial analysts and investors. From the researcher's perspective, an informed opinion regarding the banking industry and a fast diffusion of bank stock's relevant information are, contrary to the situation that

prevails for many other stock issues in the Mexican market, an important positive characteristic of the object of study, .[5]

An evaluation of the mechanism that incorporates relevant information releases into trading prices is justified not only as a systematic retrospective analysis of a historical process, but also as an advance towards a better understanding of the characteristics and limitations of the Mexican stock market. Results may provide support to mind-frames of practical use that had been previously ignored by market participants, because their existence had never before been explicitly recognized. In particular, measurement of the intensity of response of stock market prices offers an objective evaluation of the wealth effects of official information releases. From that perspective, the relevance to establish mechanisms of supervision that monitor privileged information users is adequately evaluated.

Some conclusions of this work support the necessity to improve certain regulatory aspects related with controls for the use of privileged information by traders. Market participants' confidence can be greatly reinforced if operational controls for insider trading are implemented. It is important to remember that the economic importance of the stock market consists in representing a potentially abundant source of investment funds for corporation growth and modernization. The country's efforts to achieve higher and sustained levels of welfare will be consistently supported by a greater transparency of the stock market's operations.

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[5]The problem of slow diffusion of relevant information to market participants in the Mexican market is considered in Chapter 2 as one of the operational aspects that needs to be improved, in order to transcend the stage of an "emergent market".

In any case, statistical significance tests of abnormal returns for bank stocks associated to privatization information releases represent an ideal contextual frame to evaluate different forms of market efficiency[6].

1. ANTECEDENTS OF THE MEXICAN BANKS PRIVATIZATION DECISION.

1.1 THE BANKS PRIVATIZATION CONTEXT.

Among the most transcendental steps of the Mexican government during the Salinas administration was the decision to complete the privatization of the commercial banking industry which was expropriated eight years earlier, during the financial crisis of 1982. As part of an economic strategy oriented to the achievement of a sound public finance balance, the privatization of hundreds of government-owned firms had been a standard policy since the mid-eighties. In an international perspective, the intense privatization process during the last decade was the Mexican parallel to many other countries' efforts to delimit the activities of the government in the productive sector. Privatization of state-owned firms first appeared in England, during the early eighties, and was rapidly followed by many countries. It may well be identified as a "megatrend", or global economic trend.

According to the World Bank[7], the privatization of financial services companies was present in practically all the privatization processes during the

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[6]Different forms or "degrees" of market efficiency can be observed, depending on the nature of the information that stock prices incorporate. This point is further discussed in Chapter 2.

[7]Techniques of Privatization of State Owned Enterprises, Volume III.

1980's. The privatization of banking institutions represented almost 25% of the most important privatized companies worldwide. (See Table 1.1A in the Appendix)

In México, among the vastly diversified privatization cases the banks' privatization was one of the most difficult to implement because of the special circumstances that gave place to the banking expropriation, eight years earlier. In 1982, a few weeks before López Portillo six year government term was finished, the banks' expropriation received legal support with a Constitutional reform. Since the moment it was passed by Congress, no private interest was allowed to offer banking services of any sort in the country.

1.2 THE ECONOMIC AND POLITICAL REASONS OF THE BANKS EXPROPRIATION IN 1982.

During the first half of the 1970's, large petroleum reserves were discovered in México's southeastern region. During the same period a drastic increase of international oil prices resulted from the OPEC's embargo. This new international market situation represented an extraordinary opportunity for the government-owned Mexican petroleum industry to achieve fast and profitable growth. Public investment increased rapidly in oil field exploration, in large refineries and in numerous other projects. Constrained by a limited domestic savings capacity, the investment effort for the oil industry resulted in an important increase of the country's foreign debt. From 1976 to 1981, the Mexican government's foreign liabilities increased dramatically, by more than 400%.

The country's creditors associated México's financial credit capacity with its large potential income from oil exports. Time was to prove that attitude was erroneous. Mexican policy makers at the time were also excessively optimistic in their long range projections of international oil prices and pushed the country's indebtedness further than reasonable limits.

During 1981, international petroleum supply exceeded, for the first time in many years, consumers' demand. The new situation was related to the recent discovery of important oil reserves in the North Sea, Africa and South America. These facts propitiated a turning point in the long range trend of oil prices. Besides, implementation of energy conservation plans in the vast majority of advanced petroleum importing countries represented additional pressure on oil international excedents. The combination of all those factors resulted in a meaningful reduction of oil's international quotations.

As a direct consequence of the reduction of the country's main export, the Mexican government faced its first liquidity problems when attempting to re-negotiate short term credit compromises. A group of sovereign debt-holders refused to further increase their exposure. A complex negotiation process took place to overcome the emergency, but it was clear that the situation was not anymore favorable to the petroleum exporting countries.

Since this event in 1981 domestic investors, aware of the potential risk that the government's liquidity crisis represented for the foreign exchange rate, initiated an intense capital flight towards more conservative environments. These activities further reduced the already depleted foreign currency reserves of the Banco de México (the country's Central Bank) and forced an important devaluation of the Peso in February 1982.

The February devaluation and other policy measures[8] were not sufficient to stop the capital flight. The López Portillo administration, already in its

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[8]For example, the authorization to open foreign currency accounts in domestic commercial banks and large increases in interest rates to discourage capital flight.

last months, regarded the idea of another urgently needed devaluation decision as highly unpopular.

A few months later, after more than one year of intense capital flight, foreign currency reserves were finally exhausted. A new devaluation was impossible to avoid and took place during August 1982.

In his last Presidential address to the Nation, José López Portillo announced the decision to expropriate the banking industry. The political justification of that decision was the argument that banks themselves had propitiated the disastrous capital flight.

1.3 THE DE LA MADRID'S GOVERNMENT: A PERIOD OF DEEP STRUCTURAL ADJUSTMENT.

During De la Madrid's presidency (1982-1988) deep structural adjustments took place. His administration was characterized by a chronic recession and financial instability, yet, at the same time, a new development strategy was defined. While the International Monetary Fund orthodox adjustment plans intensified and prolonged the economic turndown, representing large social costs, De la Madrid's efforts to heal the economy were consistent and on the right direction.

Some of the most important economic aspects of De la Madrid's presidency were:

a) A significant reduction in the government's bureaucracy, by eliminating redundant administrative areas and unproductive employments. The magnitude of this effort represented a cut down of almost one half of the government's employees. Results were satisfactory: when foreign debt payments

are excluded, government spending in 1987 was 70% lower in real terms, compared to 1982.

b) One of the most successful tactics to reduce a large fiscal deficit and generate extraordinary cash inflows for the government was to liquidate, sell or merge state-owned companies. In many cases, privatized companies were profitable companies, but required huge investments to survive in the very competitive global environment of the coming decade. Numerous privatizations of state-owned companies (among others, the decision to privatize 33% of the Mexican Bank's state-owned capital in 1985, effective in 1987) took place. At the beginning of De la Madrid's government, in 1983, the number of the state-owned firms was 1,074. By the end of his mandate, in 1988, that number had been reduced to 412 and many of those remaining were already in the process of disincorporation. (See Chart 1.1A in the Appendix)

c) The political rationality for the intense privatization process of the 1980's was that the government could best focus the scarce available resources on the national social priorities: combat on poverty, social security and education. More attention and resources were devoted to public spending programs considered to be of high priority from a social point of view, but a simultaneous effort to reduce and rationalize subsidies was implemented. Many public expenditures were eliminated, and only those fully justified continued.

d) The country's financial situation was precarious during most of the De la Madrid's presidency. The significant reduction of the petroleum exports income and the heavy burden of a large sovereign external debt were decisive impediments to a consistent recovery of the ailing economy. De la Madrid took the first steps towards a re-negotiation of the country's debt, but was not very successful.

e) One of the central objectives of the government since 1983 was the liberalization of the economy. The vast amount of structural changes required

profound revisions of the legislative and regulatory frame. The process of legislative changes was pervasive and comprised many different activities, such as: agriculture, fishing, industry, transportation, tourism, communications, financial services, technology transference, and international trade[9].

f) The inflation rate measured by the National Consumer's Price Index reached 157%. during 1987. By that year several countries had experimented with unorthodox adjustment plans[10] to control accelerated inflationary processes. The first two were short lived and controlled inflation for a very short period, and Israel's program was very successful in reducing hyperinflation, but two digits inflation remained present. Macroeconomic stability had been an earnestly ambitioned objective but the results of the IMF orthodox adjustment plans failed repeatedly. México's version of an unorthodox stabilization plan, the Pacto de Solidaridad Económica, benefited from the right policies and was careful to avoid the errors of its predecessors. The PSE started in December, 1987, and was one of the most effective efforts of De la Madrid's government to control hyper-inflation.

The PSE was an interesting combination of orthodox policies (tight monetary and fiscal controls) and a formal agreement among the government, the private sector and the organized workers to control inflation. It was a well-coordinated macroeconomic plan towards the objective of reducing consumer prices' growth by attacking its roots: demand pull, cost push and psychological

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[9]In particular, the fast reduction of import duties as a result of Mexico´s entry to the General Agreement of Trade and Tariffs (GATT).

[10]Brasil´s "Plan Cruzado", Argentina´s "Plan Austral", and Israel´s stabilization program, are among the most interesting cases.

inertia. Although its most significant achievements were not evident until the new government was in power, in 1988 the inflation rate was down to 59.7%.

2. THE SALINAS DE GORTARI GOVERNMENT AND THE DECISION TO PRIVATIZE BANKS.

Although the PSE started during De la Madrid's presidency, the new Salinas' government made a firm commitment to consolidate the progress achieved during the previous administration. Several relevant aspects of the Salinas' government until 1993 are worth mentioning:

a) Macroeconomic policy instruments were all coordinated towards the objective of reducing inflationary pressures in the economy. By December, 1989, Salinas first year in power, inflation rate was reduced from 59.7% the previous year to only 19.7%.

b) Domestic interest rates decreased, from levels that were consistent with the very high inflation rate of 1987, to much lower levels during the following years, although always maintaining positive real yields. Interest rate reduction had a favorable effect on the fiscal budget by reducing the internal debt service in a corresponding proportion.

c) The Peso-USD exchange rate was fixed with a reasonable under-valuation margin to promote exports and control inflationary pressures coming from

imports costs push[11]. Exchange rate stability also favored domestic capital return from overseas and a notable increase of foreign investment.

d) A successful external public debt re-negotiation[12] was finally achieved in satisfactory terms for both creditors and debtor in 1989. That agreement substantially reduced the country's capital outflow from an average of 6% of the Gross Domestic Product in the previous years (from 1983 to 1988), to only 2.5% in 1989 and 1.8% for 1994. Without the re-negotiation, the country's transfer to international creditors by 1994 would have represented 14% of GDP.

The government also intensified the width and breadth of the priv0atization process. (See chart 1.1A in the Appendix) Building on the experience of the previous administration, the Salinas team implemented an efficient and transparent auction mechanism that successfully handled different industries state-owned companies' privatization.[13]

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[11]The Mexican economy´s largest volume of imports correspond to capital goods and production inputs. Thus, fixing the exchange rate reduces cost push inflation from imported goods to the country of origin inflation level. Most of the country´s imports come from the United States, and inflation rates for that country have remained under the 5% level in recent years.

[12]At the moment of the re-negotiation the global amount of the Mexican external debt was close to 97 billion USD.

[13]During the first years of the new government, several firms that are leaders in their industries were partially or completely privatized. Among the most important are: Telmex, Aeromexico, Mexicana de Cobre, Altos Hornos de Mexico, Siderúrgica Lázaro

During the first half of 1987, on average 33% of the state-owned bank's stock was publicly offered and acquired by private investors. The offering was made through the Mexican stock exchange for 13 of the 18 commercial banks then existing. The partial privatization of banks was evidently well received by the market participants when their first days stock price increases are contrasted with the market at large. During 1990's first months two more banks were partially privatized.

The decision to completely privatize Mexican banks was publicly announced by President Salinas on May 2, 1990. That announcement represented the culmination of a serious political and economic advance towards modernization in the financial sector.

Since December, 1989 important legal initiatives for the financial sector affecting banks, insurance companies, stock brokerage houses and investment funds were sent by Salinas to Congress. An innovation contained in this set of initiatives was the introduction of the legal figure of Financial Group[14].

The stated objective of the 1989 initiatives was to achieve modernization of the financial sector to provide support for the economy's recovery. The strategy to follow was to increase domestic savings participation in GDP to as much as 25% by 1994, and prepare the Mexican financial sector participants to face the technological change and intensity of competition in the international arena.

Cárdenas, and Aseguradora Mexicana. By April 1991, estimated income from those transactions was more than 3 billion USD.

[14] A Financial Group is composed of different financial entities with only one of each type (For example, a stock brokerage house, a foreign exchange house, an insurance company, among others).

After the bank privatization announcement, the financial sector's regulatory frame changes continued. Besides the presidential initiative to reform the Constitution in order to give legal support to the privatization process, in June of that year a new package of presidential initiatives for financial regulations changes was sent to Congress, including a new Law for Banks, and a Law to Regulate Financial Groups.

3. THE BANK PRIVATIZATION PROCESS.

A mechanism to privatize the banks was implemented in two phases. The first one consisted of performing an objective valuation of banks. Valuation included the total assets of each institution. Special attention was devoted to the credit portfolio. An innovative mechanism to grade the outstanding credit portfolio of each bank was utilized. The second phase was the auction process which consisted of registration, grading and selection of the investors groups interested in participating.

The Committee for the Disincoporation of Banks, dependent of the Ministry of Treasure, and integrated by members of that Ministry, Banco de México, the National Securities Commission and the National Banks Commission was the government's representantive in the implementation of the auction mechanism.

Only the "A" series stock, representing the controlling interest (66% of the total net worth), was auctioned, since the "B" series (33%) had already been sold.

The Committee published the call for all interested participants in each of the auctions through the Official Diary of the Mexican Government, as well as the most important national newspapers. The chronological ordination of the auctions was decided on the basis of the interest shown by possible acquirers, among other criteria. Particular conditions for each auction were informed at the same time that

the auction was officially announced. Interested parties were obliged to make a deposit to guarantee the seriousness of the postures, and to maintain strict confidentiality with respect to the information, received from the authorities, for the bank being auctioned.

The banks privatization concluded in a period of a little over a year, from June 10, 1991 to July 4, 1992. Eighteen commercial banks' controlling interest (an average of 66.7% of outstanding stock) was privatized.

The Mexican government received an income of 37,856.44 million New Pesos, equivalent to over 12 billion U.S. Dollars. It was, by the magnitude of financial resources generated, the most important privatization process that has taken place in México, to the present day.

II.- EVENT STUDY METHODOLOGY

1. COMPETITIVE MARKET STRUCTURES AND MARKET EQUILIBRIUM.

A basic building block of the neoclassical microeconomic conception of a competitive market structure is the idea that the equilibrium price of any good or service at any moment permits available supply to be exactly equal to existing demand. The particular volume of transactions and the price at which that equality takes place is referred to as the "equilibrium volume and price".

A whole body of microeconomic theory known as "Price Theory" deals with the mechanisms that determine equilibrium as well as the special circumstances (like the government intervention in the economy) and market structures (oligopoly, monopoly, or monopolistic competition) that represent potential distortions to attain a stable equilibrium based on a supply-demand correspondence.

Abundant empirical evidence supports the argument that practically all the typical market structures in today's economies may be classified as different from the perfectly competitive market neoclassical conception. Nevertheless, economists are the first to recognize that contemporaneous financial markets are closest to the theoretical perfect market competition structures than any other existing.

According to Scherer and Ross [1990],

> . . .a market is said to be competitive (or more precisely, purely competitive) when the number of firms selling a homogeneous commodity is so large, and each individual firm's share of the market is so small, that no individual firm finds itself able to

influence appreciably the commodity's price by varying the quantity of output it sells.

In mathematical terms, the prevailing market price represents a limit to the competitive seller - it is determined by market forces and not subject to the individual seller's conscious control.

Scherer and Ross' definition can be interpreted in the realm of the financial markets as the assertion that a financial asset equilibrium price represents a consensus of market participants about the intrinsic value of the asset, based on all available information.

How to measure the worth of a financial asset is widely researched and debated in the finance literature. The major models include the Capital Asset Pricing Model [Sharpe, 1964; Lintner, 1965; Mossin, 1966], and the Arbitrage Pricing Model [Ross, 1976]. An important underlying assumption of these pricing models is that the market's equilibrium price determination depends on an efficient mechanism that incorporates the available relevant information set.

2. THE "EFFICIENT MARKET HYPOTHESIS".

During the last two decades the **"Efficient Markets Hypothesis"** has been a dominant topic in the financial literature. The EMH proposes that, a certain equilibrium price remains, until a new piece of information is incorporated to the original information set. The market will interpret it and reformulate the asset's worth appraisal, thus, modifying the equilibrium price.

"Information is reflected by security prices when prices change because of changes in demand. The process of disseminating and analyzing information to develop new expectations about future prices determines the degree of efficiency in the market." (Dyckman and Morse, 1986).

The result of the new appraisal of the asset's worth might as well be an increase or a decrease of it's market price. The prices' variation will depend in direction and magnitude on the investors' interpretation with respect to the new piece of information relevance, in terms of risk and future returns. Accordingly, the new equilibrium price will hold until yet another piece of relevant information reaches the market. Elton and Gruber [1991] neatly express this idea when they write the following: "When someone refers to Efficient Capital Markets, they mean that security prices fully reflect all available information."

The EMH maintains that the market is capable of assimilating relevant information as soon as it arrives, and incorporating it into securities prices. The market's ability to adjust to a new equilibrium price as soon as the relevant information set changes depends on the existence of investors who can gather, analyze and interpret information on the stocks they are trading. By constantly surveying the market and because of the large size of their transactions, they ensure that equilibrium prices are competitive. "Any arbitrage opportunity is rapidly exercised, until it vanishes." (Dyckman and Morse, 1986).

Elton and Gruber [1991] mention that the origin of the EMH was rather uncommon. While, in general, ". . .a theory is suggested and then extensive tests are undertaken to try to see if it better describes reality than previously accepted theories. . . ", in the case of the EMH the development was exactly in the opposite sense.

> First, extensive tests were undertaken that demonstrated that, contrary to popular belief, certain types and ways of using information (usually past prices) did not lead to superior profits. When evidence along these lines accumulated, academics went in search of a theory to explain these findings and the EMH was born. Elton and Gruber (1991)

Fama [1970] was among the first to use the term "Efficient Market" to describe the nature of the price setting mechanism that fully and immediately incorporates all relevant information into securities prices. For prices to reflect all available information seems to be an extremely strong assumption. According to Fama, different levels of market efficiency are observable, depending on the "type" of information to be incorporated into securities prices. He proposed classifying the degree of efficiency in a market as Weak Form Market Efficiency, Semi-strong Form Market Efficiency and Strong Form Market Efficiency.

3. WEAK, SEMI-STRONG AND STRONG FORMS OF MARKET EFFICIENCY.

Weak form market efficiency is present when securities prices incorporate all of the prices' historical information (past price series). The Semi-strong form exists when prices reflect all publicly available information at a certain moment. The Strong Form version of the EMH affirms that both public and private information sets are incorporated in an efficient and unbiased manner into the securities' prices. Consequently, empirical tests with the purpose to confirm the existence of these various forms of Market Efficiency are based on different sets of information.

In the Weak Form tests of market efficiency, the relevant information set is the past sequence of securities' prices. Weak form tests of market efficiency intend to demonstrate that all of the information contained in historical prices is fully incorporated into current prices.

The Semi-strong Form tests of market efficiency refer to a more comprehensive information set, which includes all publicly available information including historical data. These are tests of whether all publicly available relevant information is completely reflected in securities' prices.

Finally, the Strong Form tests of market efficiency deal with the most comprehensive information set, which includes, besides the two previous ones, investor's private information set. Strong Form tests intend to evaluate the degree to which this most comprehensive set of information is quickly and unbiasedly incorporated into securities prices.

Empirical tests of Weak Form market efficiency cannot prove that past returns are irrelevant to predict future prices. What can be tested is whether past price series combinations can be used to forecast future prices. An impressive number of studies of alternative historical price patterns exist, but provide no evidence that supports the idea that they can be used to predict future prices behavior. A general conclusion of these studies is that "if there is information in the past price series, it is insufficient to make money". (Elton and Grueber, 1991). Curiously enough, most of the Weak Form tests of market efficiency were performed before the EMH was developed. In most cases, these studies were simple tests of the degree of association of equilibrium prices through time. The degree of association found was interpreted as a measure of their potential usefulness in security selection.[15]

Tests of the Semi-strong version of the EMH are tests of whether current security prices reflect not only past price series information, but all publicly available information. This means that prices adjust quickly and in an unbiased manner to such announcements as financial statement reports, dividends' announcements, merger announcements, regulatory changes and other relevant pieces of information. This form of market efficiency test has become very important

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[15]See Elton and Gruber [1991], p. 409, for a fairly detailed list of "Random Walk" studies and their most relevant results, all converging to the general conclusion that past prices are a poor predictor of future prices.

from the market traders' and financial analysts' perspective, for the empirical demonstration that the Semi-strong Form of market efficiency holds is equivalent to declaring security analysis ineffective as a means to achieve above-normal returns. Lorie and Hamilton [1973] make the following very illuminating commentary with regard to the evidence of the existence of the Semi-strong Form of market efficiency:

> There is a curious paradox. In order for the hypothesis to be true, it is necessary for many investors to disbelieve it. That is, market prices will promptly and fully reflect what is knowable about the companies whose shares are traded only if investors seek to earn superior returns, make conscious and competent efforts to learn about the companies whose securities are traded and analyze relevant information promptly and perceptively.

Considering the vast amount of relevant publicly available information and the widespread interest over the analysis and measurement of the impact of exogenous events on financial assets' prices, it is not surprising that the aim to test Semi-strong market efficiency has stimulated the production of a large amount of academic research.

In fact, a whole new avenue of research in finance and accounting called **"Event Study Methodology"** is focused precisely on the understanding and measurement of the process of wealth creation, destruction and redistribution originated by specific exogenous events. The central objective of most Event studies is to determine the presence of positive or negative abnormal returns to current stock holders as a result of firm (or industry) specific exogenous events.

Empirical tests of the Semi-strong Form of market efficiency share fundamental similarities. Their general objective is to examine stock returns

following several kinds of relevant information releases. A common feature to all of them is the use of a measure of abnormal returns. According to Dyckman and Morse [1986], when investors can consistently obtain above-normal returns by trading at the time of the public announcement, then the stock market would be inefficient with respect to that information.

For all practical purposes, an abnormal return can be defined as the difference between a security's observed return on a certain date, and the return that should be expected according to a particular Returns Generating Model.

The Strong Form version hypothesis testing refers to the most extreme case of market efficiency. Strong form tests' interest is to test whether all information, public and private, is quickly and unbiasedly reflected in securities prices. Accordingly, private information holders would not be able to obtain extraordinary returns by trading based on their private information. Although this version is conceptually more difficult to accept, a rational explanation that supports its validity is the following: "Competition among the privately informed investors might be sufficient to produce prices that reflect private information". (Dyckman and Morse, 1986).

Empirical testing of the Strong Form version is usually centered on the use of insider traders' market transactions' records to obtain above than normal returns. Records (like the Official Summary of Insider Trading in the United States) containning infromation about insider's trading on their own stocks are not available in every country. This is an insurmountable difficulty for Strong Form version tests in less developed and less institutionalized markets (which is the case for Mexico's stocks market).

Finally, an argument can be made that the Strong Form version of the EMH implies that information and trading costs are always non-existent. Since positive information and transaction costs do exist, Strong Form efficiency may be

considered infeasible. "Its advantage, however, is that it is a clean benchmark that allows ... to sidestep the messy problem of deciding what are reasonable information and trading costs." (Fama,1991).

4. RETURN GENERATING MODELS (RGM'S).

According to Fama [1991] the EMH is a simple statement that security prices reflect all available information. "Using simple tools, (. . . event studies . . .) research document interesting regularities in the response of stock prices to investment decisions, financing decisions and changes in corporate control."

Empirical tests of market efficiency use a variety of RGM's to detect and measure the effect of new information arrival on the market's appraisal of security's prices. The choice of a particular RGM depends on the researcher's object of study and theoretical perspective.

Brown and Warner [1980] explicitly recognize the relevance of a return generating model to measure a security's price abnormal performance: "A security's price performance can only be considered "abnormal" relative to a particular benchmark." The selection of such a benchmark, thus, represents an important aspect of any research design aimed to detect the presence of an "informational effect" on a security's price. That is,

> For each model, the abnormal return for any security in time t is defined as the difference between its actual *ex post* return and that which is predicted under the assumed return-generating process... Brown and Warner [1980].

BW [1980] use monthly returns data to examine the comparative ability of several RGM's to identify the presence of abnormal returns generated by simulation under a variety of circumstances. The RGM's used are:

A) MEAN ADJUSTED RETURNS MODEL:

The predicted return for a security is equal to a constant estimated by averaging a series of past returns. To implement this test, the authors examine whether the returns on the sample securities in the event month are statistically significantly different from the returns on the securities in the period surrounding the event.

B) MARKET ADJUSTED RETURN MODEL:

The expected firm return is equal to the market return for that period. Expected returns are constant across securities but not across time. This model takes into account marketwide movements occurring at the same time that the firms of interest experience an event, and, for that reason, incorporates a more comprehensive information set when compared to the previous model.

C) MARKET AND RISK ADJUSTED MODEL:

The firm return is assumed to be a linear function of the market return (an Equally Weighted or Value Weighted Index). This model takes into account, besides market-wide factors, a firm specific measure of risk. Algebraically,

$$R_{jt} = \alpha_j + \beta_j R_{Mt} + \varepsilon_t.$$

R_{jt} = return of stock j at time t.

α_j = regression line vertical axis intersection

β_j = regression line slope (systematic risk).

R_{Mt} = market return at time t.

ε_t = error of estimation.

Another frequently used model in event study research is the **Capital Asset Pricing Model (CAPM)**, "originally developed by Sharpe and Treynor and clarified by Lintner [1965], Mossin [1966], Fama [1968] and Long [1972]" (Jensen and Scholes, 1972), is one of the milestones of equilibrium models for the pricing of capital assets.

The CAPM is built on a wider set of assumptions than Brown and Warner's model:

1) All investors are single period, risk-averse, utility of terminal wealth maximizers and choose among portfolios solely based on mean and variance.

2) There are no taxes or transaction costs.

3) All investors have homogeneous beliefs regarding the parameters of the joint probability distribution of all security returns.

4) All investors can borrow and lend at a given riskless rate of interest.

The CAPM asserts that the only variable that represents a difference in expected returns is the risk coefficient or "Beta" and that the relationship between this coefficient and expected returns is linear.

There are some conceptual problems in the empirical testing of the CAPM:

1) Since this model is based on "expectations of returns" which are not directly observable, tests of CAPM have used past returns to proxy for future expected returns.

2) Even if securities or portfolios' past returns are a tentative substitute for expected returns, there problem of observing the market returns still remains.

Roll [1977] pointed out the importance to observe the true market return, which should include the returns on all assets. For analytical purposes, Roll's critique of empirical testing of the CAPM is divided into two main arguments:

In the first one, he claims that the results of tests as those performed by Black, Jensen and Scholes [1972] and Fama and Mac Beth [1974] are "tautological", since it is feasible to obtain the same results, no matter what the prices generating mechanism-risk of securities relationship is in the real world.

In the second, he claims that since the only prediction of the CAPM is that the market portfolio is efficient, testing the CAPM should concentrate in precisely that issue. Unfortunately, the market portfolio is unobservable for all practical purposes (since that portfolio should contain every asset in the international economic system). If this is the case, Roll concludes, the CAPM is not empirically testable.

Ross proposes an alternative model that overcomes the CAPM's empirical testing difficulties, which he calls the **Arbitrage Pricing Model (APT)**.

> "Proponents of the APT argue it has two major advantages over the CAPM. First, it makes assumptions regarding investors' preferences that some would argue are less restrictive... Second, the proponents of the APT argue that the model can be refuted or verified empirically." (Haugen, 1990).

APT is based on the law of one price, which says that two items that are the same cannot sell at different prices. The APT's fundamental assumption is that security returns covariances can be attributed to the fact that the securities respond, to one degree or another, to the influence of one or more factors. Thus, the rate of return to a stock "j" in a given period "t", is supposed to be given by a multiple index linear model, where each index contains relevant economic information for the stock's equilibrium price (and rate of return). The empirical testing difficulty of the APT resides on the identification of which factors should be considered in the model's empirical contrasting, as well as the theoretical foundings of that choice and not another. All the theory specifies is a structure for asset pricing; the nature of the information set that should affect expected returns is not enunciated. Although empirical research of the APT is still in the early stages, interesting perspectives seem to be attached to it.

Brown and Warner (1980) explicitly relate their Market and Risk Adjusted Model to the Capital Asset Pricing Model. However, for all practical purposes the model they use is closer to Fama's "Market Model" than to the CAPM.

The Market Model simply argues that returns on security "j" are linearly related to returns on a "market" portfolio. Fama's version of the Market Model is not supported by any theory of return generation mechanisms or simplifying assumptions that are difficult to sustain when empirical testing ensues. Its consistency resides on the assumption that given a "relatively" normal distribution of returns, the joint distribution of any specific security's return and the "market" portfolio's return (where each security is given an equal weight) is bivariate normal.

> This implies that the conditional distribution of the return on the security has an especially simple form, which in turn implies that the relationship between the security's return and the market's return acquires an especially simple form. Return variance explained by the market portfolio would be systematic, whereas the remaining variance represents unsystematic risk. (Fama, 1976)

This review of the variety of RGMs frequently used in the literature is certainly not comprehensive. It represents a survey of the diversity of approaches most frequently used by different researchers. Comparison of the advantages and limitations of each model will support the decision to choose one of them for the present research.

The researcher's choice of an adequate RGM to calculate abnormal returns is important. Although the different alternatives must be carefully evaluated according to the objectives and the context of an event study, it is worth noting that Brown and Warner [1980], find that different ways of measuring daily expected returns have little effect on the inference that a firm's stock price yields abnormal returns in the presence of relevant new information. They arrive to the conclusion that "In some situations, even simpler methods which do not explicitly adjust for market-wide factors or for risk perform no worse...". The same argument is taken up again by Fama [1991]:

> ...when the stock-price response to an event is large and concentrated in a few days, the way one estimates daily expected returns (normal returns) in calculating abnormal returns has little effect on inferences.

5. OTHER METHODOLOGICAL ISSUES.

Research work in the Event study field faces several methodological alternatives at different stages in the process to detect stocks' prices abnormal performance and, for that reason, it is not possible to say that there is a "standard" methodology. One of the most interesting aspects of event study's research is the wide range of new statistical procedures developed.

While diversity and innovation in statistical methodology is an attractive feature of the Event study's research avenue, it has raised some criticism. For example, Thompson [1985] discusses that although a certain parallelism exists among event studies and econometric methods, event study's researchers, more often than not, have deviated from the structure and terminology found in classical econometrics. This lack of interdisciplinary work, he argues, has resulted in a communication problem that "is more than simply pedantic in nature", since " ...a broad body of econometric literature dealing with parameters' estimation, statistical inference, and hypothesis testing often goes untapped by empiricists in finance..."

6. THE USE OF DAILY DATA.

In recent years, availability of daily stock returns databases has improved the usefulness of the Event Study Methodology to test for market efficiency. Daily prices (and price quotations availability for shorter periods) allow an increased precision in the measurement of the speed of stocks' price adjustments. Nevertheless, using daily data involves the following potential problems:

a) The Non-normality distribution of returns (and abnormal returns).

b) Nonsynchronous trading.

c) Serial and cross-correlation problems.

A) NON-NORMAL STATISTICAL DISTRIBUTION OF RETURNS

Although from a statistical perspective all RGM's that incorporate market risk and firm specific risk are based on the use of a regression model to establish a linear relationship between specific stocks' returns and market returns, empirical tests in financial studies based on the utilization of the regression modle have been subject to criticism, such as the observed non-normality of the data.

The model most frequently used, the Ordinary Least Squares Model, requires return distributions to be normally behaved, but available evidence seems to contradict that assumption.

For example, results presented by Fama [1976], show that daily returns of the Dow Jones Industrial Average stocks significantly deviate from a normal distribution: "frequency distributions of the daily returns have more observations both in their central portions and in their extreme tails than are expected from normal distributions."

Hakim [1992], presents one of the few existing analysis of the distribution of returns for 34 stocks traded in the Mexican stock exchange during the 1972-1981 period, reaching similar conclusions.

Brown and Warner [1985] find that the daily securities returns they use in their experimental design, obtained from the Center for Research in Security Prices (CRSP) database, exhibit substantial departures from normality that are not observed with monthly data. In all cases, reported statistics for kurtosis, skewness and studentized range suggest that distributions of daily returns are fat-tailed relative to a normal distribution and leptokurtic.

Departures from normality are reported less pronounced for cross-sectional mean excess returns than for individual security excess returns. This result is consistent with the Central Limit Theorem, because if excess returns in a cross-sectional sample of securities are independent and identically distributed drawings from finite variance distributions, the distribution of the sample mean excess returns converges to normality as the number of securities increases. BW comment that:

> ...these differing results for different sample sizes raise the possibility that the degree of misspecification in the event study methodology is sensitive to sample size.

Another important conclusion found in BW is that, the non-normality of returns has no obvious impact on event study methodologies ability to detect significant abnormal returns. In fact, their simulation results provide evidence in the sense that although daily excess returns are also highly non-normal, there is evidence that the mean excess return in a cross-section of securities converges to normality as the number of sample securities increases.

Dyckman, Philbrick and Stephan [1984] also present results that support the accuracy of the t-test to detect the presence of abnormal returns, although distributions of daily returns residuals are clearly non-normal.

B)THE PROBLEM OF NON-SYNCHRONOUS TRADING

There is empirical evidence that many stocks registered on organized stock exchanges are traded only infrequently. This is particularly true for smaller and not well known firms' stocks in mature markets of developed countries. In the case of emerging markets one of the most serious problems is the low trading

volume of the majority of the registered securities. In July 1991, an official publication of the Mexican Stock Exchange[16] recognized that although an important increase (by as much as 50%) in trading volume was observed in the previous two years, still more than 60% of the stocks listed were considered as "very low or null trading." This has been a frequent cause of firm's stocks official trading register cancellation[17] in recent years.

Several researchers have recognized the potential bias in the Market Model's parameters estimation (OLS estimates) due to low frequency of trading. Whether or not the Market Model's parameter estimates are biased is a relevant matter because of their theoretical meaning. That is particularly true for the sample regression line slope estimate of the market model, which is generally referred to as the "Beta" of the security and represents its "systematic risk". As acknowledged by Scholes and Williams [1977], "Because prices . . . are reported only at distinct, random intervals, completely accurate calculation of returns . . . is virtually impossible". This assertion is equivalent to the recognition of the presence of the econometric problem of estimation with deficient data (missing observations) (Kmenta, 1971).

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[16]"La bursatilidad en el Mercado Mexicano", Bolsa Mexicana de Valores e Imerval, Mexico, 1991.

[17]In Mexico, the Stock Market's regulatory and surveillance authority is the Comision Nacional de Valores e Intermediarios (CNV). A firm's stocks public trading is conditioned to the authorization of the CNV, and an already conceded authorization may be canceled under various circumstances that do not comply with the established legislation. Among other cancellation motives, low trading volume or infrequent trading can result in a register cancellation.

According to Peterson [1989], although there are different known alternatives for Beta adjustment, to solve the thin-trading problem, the most widely recognized are attributable to Dimson [1979] and Scholes and Williams [1977].

McInish and Wood [1986] examine the adjustment techniques proposed by Scholes and Williams and Dimson, and others, finding that these techniques reduce only a portion (as much as 29%) of the bias in Beta arising from thin trading and delays in price adjustments.

Scholes and Williams [1977], prove that variances and covariances of reported returns differ from corresponding variances and covariances of true returns. Since securities trade at discrete, stochastic intervals in time, recorded prices at the end of a trading day represent the equilibrium (since a transaction was consummated) price of a transaction that happened earlier in the day. OLS estimates of the market model's sample regression line parameters are biased and inconsistent because of the well known econometric problem of "errors in observations". It seems reasonable to affirm with SW that:

> . . . when measured returns are used as proxies for true unobservable returns . . . (they) deviate from normality with moments depending on properties of both true returns and non trading periods.

SW show that securities trading on average very frequently or very infrequently have OLS asymptotically biased upward for alphas and downward for betas. Also, for those securities traded with more than average frequency, sample regression parameters estimates are biased in the opposite direction.

These authors identify the relationship between measured coefficients and true coefficients, which are equivalent to the asymptotical biases for the OLS

estimators. They propose a method to construct consistent estimators for the coefficients in the market model in the presence of infrequent trading, as follows:

- The consistent estimator for beta is calculated by first running three regressions of the security's return against the market's returns for the previous, current, and subsequent periods. The three estimated betas are summed and divided by one plus twice the estimated auto correlation coefficient for the market index.

- The consistent estimator for alpha is obtained as the stock's measured average return (calculated from t=2 to t=N-1, where t is the number that corresponds to each one the of observations, and N is the total number of observations) less the consistent beta estimate multiplied by the average return of the market (also calculated from t=2 to t=N-1).

These consistent estimators of alpha and beta offer two important advantages:

(1) Computationally, Market Model parameters' estimators are constructed from two sample means plus a sum and quotient of OLS estimators. Thus, data inputs are readily available and transformations required are relatively simple using one of the existing statistical software packages[18]; and,

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[18]The statistical package used for regressions throughout this work was the Statistical Package for the Social Sciences-PC(SPSS-PC). Besides regression parameter estimates, this package offer diverse complementary output alternatives, like residuals analysis, expected values calculations and graphical analysis capabilities.

(2) The estimators do not depend on detailed assumptions about the probability distribution generating the sequence of non trading times. (Scholes and Williams , 1977)

The "adjusted" estimators of SW are shown to be equivalent to instrumental variables' estimators that use the moving sum of measured rates of return for the market as an estimation instrument.

Dimson [1979] also reviews the problems introduced by infrequent trading, and proposes a method for measuring Beta when share prices suffer this problem. This author reviews the three best known approaches that have been suggested by the literature to reduce the bias in systematic risk measurement:

(1) The introduction of lagged market returns as additional independent variables (Ibbotson, 1975; Dimson, 1974; Schwert , 1977).

(2) Return calculation on a trade-to-trade basis, and regression of these returns on market movements calculated over precisely the same trade-to-trade time intervals. (Marsh,1979; Schwert, 1977, and Franks, Broyles and Hecht, 1977)

(3) Combinations of the previous ideas and use non-synchronous data in addition synchronous market returns as explanatory variables for trade-to-trade returns. (Scholes and Williams, 1977).

Dimson proposes the use of what he calls "Aggregated Coefficients Method." He affirms that the true systematic risk (Beta) can be obtained from security price data which is subject to infrequent trading.

> All that need be done is to run the multiple regression of security returns against lagged, matching and leading market

> terms. A consistent estimate of Beta is obtained by aggregating the slope coefficients from this regression. (Dimson, 1974)

Brown and Warner [1985] mention that authors of event studies with daily data have used a variety of alternative techniques for parameter estimation, (Gheyara and Boatsman, 1980; Holthausen, 1981; Dimson, 1979; and, Scholes and Williams, 1977). They find that the bias adjustment methodologies based on the procedures suggested by Scholes and Williams and Dimson do seem to reduce biases in OLS estimates of Beta. "However, the specification and power of the actual tests for abnormal performance is similar to that obtained with the OLS market model..."

Dyckman, Philbrick and Stephan, [1984] compare the performance of the Market Model using an OLS Beta, to the Scholes and Williams and the Dimson methods. They divide firms equally into low, medium and high trading groups and use a 3% simulated abnormal return on portfolio size of 50 firms. They also introduce the effect of three days event-date uncertainty. These authors' findings are that:

> ... no improvement in either the specification or the power of the tests (...occurs...) when the Scholes-Williams or the Dimson method of estimating Beta is used to allow for the non synchronous trading problem.

They recognize, however, that this result is partly due to the sample and data selection process they follow, since:

1) The sample is based on firms included in the CRSP daily return file (a data base biased towards more actively traded stocks);

2) Firms were excluded if they had missing data, introducing an actively traded firm bias in the sample. The authors recognize that firms that remained in the sample had, on average, three times the total assets and three times the sales of firms that were excluded. This evidence casts serious doubts about the possibility to generalize their findings.

Fowler and Rorke [1983] compare the infrequent trading bias adjustment methods of Scholes and Williams and Dimson and demonstrate that "Dimson's estimate is not specified correctly". They go on to provide a corrected version of Dimson's estimate, "...that is quite operational since the coefficients must be weighted by functions of the observable serial correlation coefficients for the index."

FRJ return to the problem of Market Model parameters' estimates bias in the presence of thin trading. They suggest that most techniques designed to reduce the expected bias are based on econometric techniques that utilize observed returns and are essentially limited-information estimates. The trade-offs among the different techniques are between:

(1) The bias and efficiency of the estimates; and

(2) The computational complexities and information requirements of the econometric procedures.

FRJ review the characteristics of several bias-reduction techniques (Scholes and Williams. 1977; Dimson, 1979; Cohen, Hawamini, Maier, Schwartz and Whitcomb, 1983; and Marsh, 1979), and propose a new statistical approach that they suggest to be more efficient, "but at the price of requiring more inputs" (in the form of a frequency distribution of trades within the differencing period).

C) SERIAL CORRELATION AND CROSS CORRELATION.

The third important problem associated with the use of daily data to estimate financial assets' equilibrium prices is the presence of serial and cross correlation in the asset's returns and abnormal returns.

7. ACCOUNTING FOR EVENT DATA CROSS-CORRELATION

Different authors propose alternative techniques to deal with the serial and cross correlation problem. In Accounting empirical studies, events are often clustered to take account of cross correlation. The clustering may be by industry, by time period or by both. Studies of LIFO, like Sunder [1973] and depreciation changes, Kaplan and Roll [1972], as well as the mandated switch to full-cost accounting in the oil and gas industry. Dyckman and Smith [1979], Collins and Dent [1979], and Lev [1979], are examples in which clustering has been achieved to control for this problem.

According to Collins and Dent [1984], Gonedes and Dopuch [1974] were "among the first to identify this problem and to note that testing procedures which fail to take cross-sectional correlations into account can lead to unwarranted statistical inferences". The authors assess the "severity of problems arising from contemporaneously cross-correlated returns when there is industry concentration in the sample firms" by comparing the cross-correlation measures of abnormal returns for different size portfolios. They review different abnormal return testing methodologies (OLS and conventional t-tests; Patell Standardized Residual Test; Jaffe Standardized Residual Test) which they find to take account of cross-sectional correlation with different degrees of success.

Their proposal is to use a general model for "detecting a mean effect for a cross-section of securities utilizing generalized least squares (GLS)". The combination of analytical and simulation techniques used by these authors provide

interesting insights into the possible consequences of ignoring cross-correlation in event study's hypothesis testing, the efficiency of other cross-correlation accounting techniques and the desirable properties of their model, which is found to be sufficiently flexible to allow for:

1) Different residual variances across sample securities,

2) Non-zero cross-sectional dependency in the return data, and

3) Possible constant multiplicative changes in residual variances from the estimation to test period.

Brown and Warner [1980] discuss both (time and industry) clustering effects, one directly and the other, indirectly. When they comment on the time clustering effect for monthly abnormal returns, their concern is that :

> If performance measures such as the deviation from historical mean returns or market model residuals are positively correlated across securities in calendar time, then such clustering will increase the variance of the performance measure ... and hence lower the power of the tests.

With regard to industry clustering, their approach is indirect. They investigate the impact of risk clustering as a proxy for industry clustering, and conclude that

> ... it seems reasonable to expect that tests for abnormal performance will be more powerful for low risk securities... the intuition is simply that a given level of abnormal performance

> should be easier to detect when ´normal´ fluctuations in sample security returns are small rather than large.

Dyckman, Philbrick and Stephan [1984] also investigate industry clustering in four industry groups: Aerospace, Building, Machinery, and Oil and Gas. In three of them (except Machinery) they find a substantially lower probability of detecting abnormal performance than when clustering is not present. However, the average betas for those three industries were substantially higher than the average for all industries. Thus, higher beta firms are expected to have more volatile returns, and "if the Market Model explains, on average, the same percentage of variation for these firms as for the population, then the higher beta (industries) will have higher variance residuals". This naturally lowers the power of the tests for detecting abnormal returns.

DPS examine the time clustering effect on the ability to detect abnormal performance, and they conclude that time clustering reduces the power of the test. While the results obtained are consistent with those anticipated by Brown and Warner [1980], they contradict their empirical results: "when abnormal performance is present, the rejection rates when there is [time] clustering are not markedly different from those when there is no clustering."

Dyckman, Philbrick and Stephan [1984] reach the following fundamental conclusion:

> Event studies tend to select securities from a limited number of industries, often a single one. When, in addition, there is time clustering, the power of the statistical tests may be further eroded as both problems reinforce one another.

DPS comment that:

> ... the presence of cross sectional correlation in the specific security excess returns (Brown and Warner, 1980; Beaver, 1981; Collins and Dent, 1984) can affect the power of statistical tests if the method of variance estimation assumes cross-sectional independence of the returns.

Brown and Warner [1985] also recognize that

> ... in the presence of positive cross-sectional dependence, failure to take account of it results in systematic underestimation of the variance of the mean excess return, implying too many rejections of the null hypothesis ... (Brown and Warner, 1980; Beaver, 1981; Dent & Collins, 1984). Adjustment for cross-sectional dependence is not always necessary for reasonable test specification ... dependence adjustment can actually be harmful compared to the procedures which assume independence.

According to BW, even if the independence assumption is only an approximation, explicit use of this information can increase the efficiency of the variance estimate.

These authors present simulation results that confirm that when there is no clustering of event dates, the gains from procedures assuming independence are substantial. It is important to indicate that these results were obtained for randomly selected securities. If instead the securities came from the same industry group, with clustering (in event dates) there could be, they say, a higher degree of cross-sectional dependence. and measurable misspecification.

Salinger [1992] provides interesting insights into alternative opinions about the relevance of cross correlation and its statistical implications:

> A common procedure, developed by Mandelker (1974) and Jaffe (1974), to allow for contemporaneous correlation of AR's is to group all firms whose event window includes a particular day or month into a portfolio, to estimate the market model parameters for the portfolio, and to estimate the portfolio abnormal return. With only one portfolio each period, there is no contemporaneous correlation. However, the market model estimates for the different portfolios will be correlated with each other and, therefore, so will the estimated AR's.

If all firms experience an event on the same day, the event window overlaps perfectly and the method presented to calculate the standard deviation of CAR's can be applied to portfolio returns. On the other hand:

> ...contemporaneous correlation can be ignored if either the event dates are sufficiently dispersed that there is little overlap or if the contemporaneous correlation of the residuals is small." (Salinger, 1992)

8. ACCOUNTING FOR EVENT DATA SERIAL CORRELATION (AUTO CORRELATION).

Taking account of serial correlation in the present research becomes a critical issue because of the intense presence of non-synchronous trading for several of the Mexican banks' stocks. It is widely recognized that, besides parameters' estimation bias, thin trading can also induce serial correlation in the excess returns measures (Brown and Warner, 1985). In hypothesis tests over intervals of more than one day, failing to take into account auto correlation in estimating the variance of the cumulative mean excess return could result in misspecification. BW report that although the test statistics they use in their simulation study "did not account for auto correlation, yet seemed generally well

specified . . . it appears that auto correlation plays a minor role." However, they also report that when explicit recognition of auto correlation was made, there were two instances of small but notable improvement in test statistic specification, and no cases where specification was adversely affected.

Salinger [1992] points out that in most event studies based on the returns' procedure, the variance of a Cumulative Abnormal Return is estimated as the sum of the variances of the individual Abnormal Returns, the assumption being that AR's are inter temporally uncorrelated. Although this assumption is consistent with the "weak form" of the EMH (which assumes that "true" AR's are mutually independent), since an event study AR's measurement is based on estimated market model parameters, AR's are effectively a "forecast", and not a "true" error.

From the same argument it follows that, if the same market model estimated parameters enter the calculation of all AR's, estimated AR's are then correlated with each other. This incorrect inference can result from ignoring the contemporaneous correlation of abnormal returns in event studies. Salinger illustrates his point with an event study of post-merger performance of stocks' returns. The results support the conclusion that ignoring either the intertemporal correlation of estimated AR's or the contemporaneous correlation of returns results in a significant understatement of the standard errors.

III. THE EXPERIMENTAL DESIGN

1. THE DATABASE

That the Mexican stock market is growing in economic importance is not questionable. Statistical data on the Mexican stock market activities show a significant increase in the volume of transactions and in the number of stocks traded during recent years. Nevertheless, the stock market still represents a marginal activity in the context of the Mexican financial system. When compared with the relative importance of stock markets in more advanced countries (and even in some countries of a similar degree of economic development), either in the number of participants or in terms of the volume of resources, the Mexican stock market still lags behind.

STOCK MARKETS COMPARATIVE INDICATORS

COUNTRY	NUMBER OF ISSUERS	MARKET CAPITALIZATION /GNP (%)
UNITED STATES	9141	54
UNITED KINGDOM	2559	105
JAPAN	1752	99
KOREA	667	52
TAIWAN	205	74
MEXICO	199	16.5

SOURCE: CAPITAL MARKETS, RUTH TROELLER, MIMEO, ITESM-CEM, 1993

In spite of the growth and rapid modernization experienced in the recent past, there are still some operational aspects that the Mexican stock exchange needs to correct. Among the most important are: the limited number of corporations listed, the presence of "thin trading" (infrequent trading) for most of the stocks listed, and limited stock market information diffusion.

Although there is a potentially much larger number of corporations that fill the requirements to be listed in the stock exchange, by August, 1993, only 157 different corporations stocks were publicly traded. The limited number of securities is a result of such factors as: the strict requisites established by the National Securities Commision to authorize the public placement of a stock, a pervasive belief that sharing the ownership of a firm with other investors may represent a loss of control over the corporation's strategic plans, or a lack of understanding of the benefits that a corporation can obtain from equity financing as compared to other alternatives, not to mention the intangible image benefits that a stock market listing represents.

The low volume of trading of most stocks listed in the Mexican market is in part also due to the inexistence of market specialists (market makers). The intervention of specialists to "buffer" possible temporary differences between demand and supply of a stock (or any other financial asset) is a widely generalized phenomenon in more developed markets. Although the Mexican law encourages the existence of such participants since 1989, not much has been advanced to fully implement their activities in practice.

The Mexican exchange publishes an abundant amount of trading information in the way of daily, weekly and monthly bulletins, besides the annual operations book. The listed firms have the legal obligation to present their financial statements with a quarterly periodicity in most cases and with a monthly periodicity in the case of financial institutions. Nevertheless, the diffusion of the information is limited. Only national newspapers and some commercial television stations include a few, in general, very superficial stock market comments. This may be explained, at least in part, by the small number of stock market investors which, at the present time, is well under half a million, in a country whose population is close to 90 million people.

The problem of lack of stock market information is particularly acute in the realm of academic research. Very few scholars have published financial

research studies about any aspect of the Mexican stock market on recognized academic journals. Thus, it is not unfair to say that very little is known about its nature and mechanisms. Besides a still limited academic interest in the field, due to the "marginality" of the stock market, there is also an explanation in the fact that "historical data is not nicely organized and contained in a magnetic tape or any other medium of rapid access for academicians, researchers or the general public" (Hakim, 1992). Although the Mexican stock exchange owns an electronic database that contains market operating information of the previous five years, only stock brokerage firms with remote terminals connected to the exchange can access it.

In 1985, only three years after the banking expropriation of 1982, a first step in the direction of privatization was taken. The Government announcement that 34% of the Mexican banks' capital was to return to private hands, didn't become effective until the first moths of 1987. Thirteen out of twenty commercial banks made stock public offers during that same year. The percentage of capital publicly placed varied from one case to another. It was until the first months of 1990 that 2 more banks made public stock offers, a short time before the Government's announcement that the whole banking system capital was to be completely privatized again.

Thirteen out of the fifteen bank stock price series used in this study were obtained through the Investment Banking division of Banamex-Accival. These data-base consists of daily closing adjusted stock price[19] series for a time span that covers from the 1987 first public offerings, through the end of the privatization

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[19]The Market Model's parameter estimation for individual stocks (as well as for portfolios) was based on the time series data of banks' stocks closing daily prices adjusted for splits, dividends and subscription rights plus the two market indexes closing daily values.

process (July, 1992). Banamex-Accival also provided a time series of the Banamex-30 index (an equally weighted market index).

The two late public offerings stocks' adjusted price series were not available through the Banamex-Accival source and were obtained through Infosel, an information company with data on the Mexican stock exchange.

The Mexican Stock Exchange Index (Indice de la Bolsa Mexicana de Valores, or IBMV) time series for the period of interest was obtained from one magnetic file commercialized by the Mexican Stock Exchange.

2. THE SELECTION OF A MARKET INDEX

Authors diverge with respect to the intrinsic characteristics that a "market index" must represent so that it reflects the "average" rate of returns of the stock market. The selection of a market index is methodologically relevant because its statistical properties are expected to influence the capability of the Market Model estimate to identify abnormal returns. Since the market index represents a highly diversified portfolio, all "unsystematic" (or diversifiable)[20] risk is eliminated. For that reason, the market index return reflects the risk premium that is paid to investors

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[20]See Van Horne, James, **Financial Management and Policy**, 8th. Edition, Chapter 3, for a detailed explanation of this concept.

choosing stocks instead of a risk-free investment like Government bonds or real state properties.

In Mexico's stock exchange, few alternative market indexes are available. The only Mexican stock exchange official index is the IBMV. This is a value-weighted index based on a dynamic sample of stocks, which is revised every other month. Stocks contained in the sample are chosen on the basis of high liquidity, percentage of publicly placed capital and similarity of dispersion with respect to that of the market. The relative weight assigned to each stock in the IBMV depends on its trading value, relative to the value of trading for the whole sample.

A common criticism of the adequacy of a value-weighted index as a measure of "average" market returns is that, if one or more stocks represent a higher than proportional weight in the index, a bias determined by the behavior of the heavily weighted stocks will be present. [21]

It can also be argued that, since the sample of stocks contained in the IBMV index changes, the values it takes are not strictly comparable from one period to another. This is not the case if what the analyst is trying to measure is the stock market returns trends.

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[21]This is the case of the IBMV and Mexico's quasi-monopolic telephone company's stock. Telmex's stock prices usually have a relative weight in the order of 33% to 38% of the IBMV changing weights structure.

The other important market index for the Mexican stock exchange is the Banamex-30.[22] Returns for this index are measured in terms of an equally weighted average of the returns for the stocks contained in a fixed sample. The size of the sample, as implied by its name, is thirty stocks.

An equally weighted index is not affected by the excessive influence that a high valued stock may have in the market's performance measure. Besides, the fixed sample characteristic of the Banamex-30 is a protection against the distorting effects that may result because of a variable composition of the sample used to calculate the index variations. Nevertheless, critics of this index argue that the fixed character of the sample of stocks contained in the Banamex-30 precludes a dynamic adjustment to include increasingly active stocks (and, thus, representative stocks) or the elimination of relatively inactive stocks.

Brown and Warner [1980] point out that, although asset pricing suggests the use of a value weighted index, according to their simulation results the equally weighted index is more likely to detect abnormal security returns. They find that such a situation is consistent with the argument that ". . . the returns on randomly selected securities are on average more highly correlated with the equally weighted index than the value weighted index."

It is relevant to mention the fact that the banking sector is heavily represented in the sample of stocks included in the Banamex-30 index. This is an issue of practical nature, since the statistical role of the market index in the

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[22]The Banamex-30 index is calculated and published by the Investment Banking Division of the Banamex-Accival Financial Group.

estimation of the equilibrium pricing model parameters is that of an independent variable. The fact that in the integration of the Banamex-30 index sample, the banking sector stocks represent 26.7% of the total sample, could generate a problem of contemporaneous correlation between the stochastic explanatory variable (the market index) and the residuals of the regression model.

Given the drawbacks of both indices, for the objectives of the present study the estimation of the Market Model's parameters used to measure abnormal returns, was performed with both, the IBMV and the Banamex-30 indexes, in all cases.

Results obtained from the regressions with both indexes indicate that, consistent with what could be expected due to the heavy representativity of the banking sector, bank's stocks returns are more associated to the evolution of the Banamex-30, the equally weighted index, than with the IBMV.

In general, hypothesis tests to evaluate the statistical significance of abnormal returns give consistent results, when the Market Model estimation is performed with both indexes. If both calculations indicate the same "event effect" on returns, the conclusion is that the magnitude of the response was significant enough to be detected, independently of the market index utilized. Although infrequent in the experiments reported here, interesting questions regarding the influence of different measurements of the same market returns arise when results conflict. This point is not further explored in the present report, but represents an interesting research topic, particularly in the context of the barely studied Mexican stock exchange. To my knowledge, no research work has been performed in that line.

3. THE MARKET MODEL

mentioned earlier, the Market Model's consistency is founded on the assumption that given a "relatively" normal distribution of returns, the joint distribution of any specific security's return and the "market" portfolio's return is bivariate normal. This fact implies that the conditional distribution of the return on the security has a particularly simple form, which in turn implies that the relationship between the security's return and the market's return is also of a simple nature. (Fama, 1976)

4. THE SCHOLES AND WILLIAMS ADJUSTMENT TECHNIQUE FOR "THIN TRADING".

An experimental design issue that requires careful discussion is the generalized presence of thin trading in the Mexican stock exchange. First the problem of thin trading measurement is discussed. Then, the choice of the adjustment technique proposed by Scholes and Williams to take care of that problem is introduced.

The number of trading days for each bank's stock during the privatization period was different because the sale dates were also different. In order to establish a measure of the trading frequency that is comparable among stocks, a "thin trading" measurement index was constructed by dividing the number of days in which a stock was not traded by the total number of trading days.[24] Results were clearly supportive of the hypothesis that thin trading is a serious problem in the Mexican stock exchange, and for bank's stocks in particular. Only four stocks had a thin trading index with values less than 1%. and values for the index were as high as 66.24% and 47.98% for Confia and Banorie, respectively

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[24]A presentation of the "thin trading" index results is further undergone in Chapter 4.

3. THE MARKET MODEL

In chapter two, the EMH was explored, and it was indicated that the existence of "efficiency" in the stock market is a simple statement that, at any moment, a security's price reflects all available information relevant to its market valuation. [23] It was also established that a security's price performance can only be considered "abnormal" relative to a benchmark. The selection of such a benchmark represents an important aspect of any research design aimed at detecting the presence of an "informational effect" on a security's price.

Contrasting the polemic arguments that surround the most frequently used security's pricing equilibrium models, i.e. the CAPM and the APM, is a complex task not undergone here (this subject may well serve as a dissertation topic in itself). In order to choose an adequate benchmark to measure the abnormal performance of bank's stock prices, the most relevant operational features of the conventional models were evaluated, and the characteristics of Fama's version of the Market Model were found adequate for this work's objectives. The Market Model simply argues that returns on a particular security are linearly related to returns on a "market" portfolio.

The Market Model is not supported by any complex underpinnings of return generating mechanisms which can be theoretically challenged or simplifying assumptions that are difficult to sustain when empirical testing ensues. As was

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[23]Academic financial research in the field of "Event Study Methodology" is interested in detecting the regularities in the response of stock prices affected by the release of new pieces of relevant information .

Two alternative techniques were considered in order to overcome the influence of this disturbing problem.

The first one was the use of monthly data as a means to eliminate non-trading observations from the sample. Regression results to estimate the Market Model were in general satisfactory and the residuals distribution was closer to normal than the daily observations residuals (monthly regressions and residual parameters results are not included in the present report).

Nevertheless, the generalized economic and financial markets turbulence observed during the 1987-1988 period in Mexico generated a changing regression model's parameters problem The estimation period with 50 observations included the high inflation economic period of 1987-1988 and the speculative market boom and posterior crac of 1987.

Another important drawback of using a monthly observations periodicity, from this study's perspective, is the fact that the informational effect measurement is more imprecise and confused by other possible influences. Dyckman, Philbrick and Stephan [1984] emphasize the importance of establishing the precise event date. "If the event date is known with certainty, tests which incorporate residuals over longer periods are less powerful in detecting abnormal performance than tests specific to the day of announcement."

The second alternative to deal with the low frequency of trading problem was to use one of the available adjustment techniques to eliminate the potentially distorting effect of thin trading on the Market Model's parameter estimation. Although not much agreement exists at the present time on this subject,[25], several

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[25]This point was more extensively commented in Chapter 2.

authors acknowledge different attempts to develop thin trading adjustment techniques. For example, McInish and Wood [1986] report having examined the adjustment techniques proposed by Scholes and Williams, Dimson, and others, finding that these techniques reduce only a slight portion of the bias in Beta arising from thin trading, Contradictorily, Brown and Warner [1985] find that the bias adjustment methodology suggested by the Scholes and Williams seems to effectively reduce biases in OLS estimates of Beta. Fowler and Rorke [1983] also compare the infrequent trading bias adjustment methods of Scholes and Williams and Dimson and demonstrate that Dimson's estimate is not specified correctly.

A review of the arguments in favor and against the different adjustment techniques supported the decision to perform the Market Model estimation with the use of daily data, along with the Scholes and Williams' technique to adjust the Market Model's parameters for thin trading.

SW establish the existence of a statistical relationship between measured coefficients and true coefficients. That relationship is equivalent to the asymptotical biases for the OLS estimators. These authors derive a method to obtain consistent estimators for the Market Model's coefficients in the presence of infrequent trading, as follows:

$$\beta_{SW} = \frac{b_n^- + b_n^0 + b_n^+}{1 + 2\rho_M} .$$

$$\rho_M = \frac{\sigma_{R_{Mt}, R_{Mt-1}}}{\sigma_{R_{Mt}} \sigma_{R_{Mt-1}}} .$$

$$\alpha_{SW} = \frac{1}{T-2} \sum_{T=2}^{T-1} R_{nt} - \frac{1}{T-2} \beta_{SW} \sum_{T=2}^{T-1} R_{Mt} .$$

β_{SW} = calculated value for market model regression line slope

α_{SW} = calculated value for market model regression line intercept

b_n^- = calculated regression line slope for lagged market return

b_n^0 = calculated regression line slope for market return

b_n^+ = calculated regression line slope for advanced market return

ρ_M = correlation between normal and 1 day lagged series of market returns

R_{Mt} = market return at time t

R_{Mt-1} = market return at time t - 1

$\sigma_{R_{Mt},R_{Mt-1}}$ = covariance between R_{Mt} and R_{Mt-1}

σ_{RMt} = standard deviation of R_{Mt}

σ_{RMt-1} = standard deviation of R_{Mt-1} .

5. CALCULATION OF THE VARIANCE OF ABNORMAL RETURNS AND CUMULATIVE ABNORMAL RETURNS.

Brown and Warner [1985] indicate that, while the non-normality of the returns and excess returns are unimportant in tests of 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.

A survey on the finance literature's concern over the variance and standard deviation calculations aimed to perform significance of abnormal returns tests has already been presented in Chapter 2.

The variance and standard deviation calculation techniques selected for this dissertation's experiments are basically those proposed by Salinger [1991]. Salinger's statistical tests consider the variance estimation problem in the presence

of serial and cross correlation of the sample data. Since those two problems are present in the bank stock returns database, Salinger's methodological proposals are adopted in most cases.

When the event date is the same for all the stocks in a portfolio, the way to test for abnormal performance of returns is to aggregate the raw returns of each stock included into a portfolio, estimate the Market Model parameters for the portfolio, and then calculate abnomal returns.

$$\mathbf{ARpt} = \mathbf{Rpt} - \hat{\alpha}_p - \hat{\beta}_p \mathbf{Rmt} \ .$$

The standard deviation to be used in the standardization of abnormal returns is equal to the squared deviations of observed from expected returns divided by the number of observations minus 2, since two degrees of freedom were lost when the Market Model parameters were calculated.

$$\sigma_p = \left[\left(\sum_{j=1}^{T} \mathbf{Rpj} - \hat{\mathbf{R}}\mathbf{pj} \right)^2 \ / \ \mathbf{T} - \mathbf{2} \right]^{1/2} \ .$$

Since the standard deviation of abnormal returns is an "average" value of the dispersion of the data when the independent variable is the market return (the continuosly compounded return calculated on the market index selected), an adjustment to take into account the distance between the market return observation corresponding to the event and the average market return is needed. The resulting statistic is called the standard deviation of the forecast:

$$\sigma\ (\mathbf{fpt}) = \sigma_p \left[\ 1 + \frac{1}{T} + \frac{\left(\mathbf{Rmt} - \overline{\mathbf{Rm}}\right)^2}{\sum_{j=1}^{T} \left(\mathbf{Rmj} - \overline{\mathbf{R}}\mathbf{m}\right)^2} \ \right]^{1/2} \ ;$$

The standardized abnormal return to be tested is defined as:

$$\mathbf{SARpt} = \mathbf{ARpt} / \sigma(\mathbf{fpt}) \ ,$$

which is distributed like a "t" statistic with T-1 degrees of freedom.

Now, for cumulative abnormal returns, since the returns are continuosly compounded, returns from 1 to U are simply the sum of the single period returns:

$$\mathbf{CARp} = \sum_{t=1}^{U} \mathbf{ARpt} \ .$$

The formula for the variance that takes into account intertemporal correlation is:

$$\sigma^2_{fpc} = U\sigma^2_p \left[1 + \frac{U}{T} + \frac{U\left(\frac{CRm}{U} - \overline{Rm} \right)^2}{\sum_{J=1}^{T} \left(Rmj - \overline{R}m \right)^2} \right]$$

where:

σ^2_{fpc} = **CAR variance that takes into account autocorrelation**

U = Accumulation period

T = Estimation period of length T

σ^2_p = **Forecast error variance for portfolio p**

CRm = Cumulative return of Rm, during the period U

$\overline{Rm}$ = **Average market return during estimation period.**

The standardized cumulative abnormal return used to test the hypothesis of abnormal returns presence is:

$$\mathbf{SCARp = CARp / s_{fpc}} \ .$$

When the event date of interest is different for different stocks, the adequate technique to test for the significance of abnormal returns requires the estimation of the Market Model for each stock, and then, to aggregate abnormal returns at times 0, -1,-2,-3, . . ., to obtain an average abnormal return of the N stocks portfolio at time t:

$$\mathbf{AR_{Nt}} = \left(\sum_{I=1}^{N} \mathbf{ARit} \right) \ / \ \mathbf{N} \ .$$

Assuming the independence of abnormal returns, (which is a reasonable assumption, given that each stock's sale date event occurred on different calendar days), the formula to calculate the variance of the portfolio at time "t" is:

$$\sigma^2(\mathbf{AR_{Nt}}) = \sigma^2\left[\sum \mathbf{ARit/N}\right] = \frac{\mathbf{1}}{\mathbf{N^2}}\left[\sum \sigma^2(\mathbf{ARit})\right]$$

where:

$$\sigma^2(\mathbf{ARit}) = \sigma_i^2\left[\ 1 + \frac{\mathbf{1}}{\mathbf{T}} + \frac{\left(\mathbf{Rmt} - \overline{\mathbf{Rm}}\right)^2}{\sum_{J=1}^{T}\left(\mathbf{Rmj} - \overline{\mathbf{R}}\mathbf{mj}\right)^2}\ \right]$$

and:

$$\sigma^2_i = \left[\left(\sum_{j=1}^{T} Rit - \hat{R}it \right)^2 \; / \; T - 2 \right]$$

Rit = Return on stock "i"

$\hat{R}$it = Market Model generated "normal" return on stock "i" .

The test statistic that allows the measurement of the significance of abnormal returns is:

$$SAR_{Nt} = \overline{AR_{Nt}} \; / \; \sigma\left(\overline{AR_{Nt}}\right)$$

which is a statistic distributed like a N(0,1) in the absence of abnormal behavior.

For an event window of several days, the following formulas apply.

The cumulative abnormal return for one stock during a period of U days is equal to:

$$CAR_{iU} = \sum_{t=1}^{U} ARit \; .$$

The variance for the cumulative average abnormal return for one stock is given by:

$$\sigma^2(CAR_{iU}) = U\sigma_i^2 \left[\; 1 + \frac{U}{T} + \frac{\left(Rmt - \overline{Rm}\right)^2}{\sum_{j=1}^{T} \left(Rmj - \overline{R}m\right)^2} \; \right] \; .$$

The cumulative average abnormal return for a portfolio of N stocks is equal to:

$$\mathbf{ACAR}_{Nu} = \left(\sum_{I=1}^{N} \mathbf{CARiu} \right) / \mathbf{N} .$$

and the variance of the cumulative average abnormal return for a portfolio of N stocks during a period of U days is:

$$\sigma^2(\mathbf{ACAR}_{NU}) = \sigma^2\left(\sum_{I=1}^{N} \mathbf{CAR}_{IU} / \mathbf{N} \right) = \frac{1}{\mathbf{N}^2}\left(\sum_{I=1}^{N} \sigma^2(\mathbf{CAR}_{IU}) \right);$$

the test stastistic this time is:

$$\mathbf{SACAR}_{NU} = \mathbf{ACAR}_{NU} / \sigma(\mathbf{ACAR}_{NU})$$

which is distributes like a N(0,1) in the absence of abnormal behavior.

6. RESEARCH DESIGN OBJECTIVES.

The general purpose of this study is to perform a detailed examination of Mexican banks stock price behavior, during the banking system privatization period, going from May 2, 1990, through July 6, 1992.

All of the hypotheses tested in this study are actually joint hypothesis, in the sense that, although the EMH provides a theoretical framework to establish the object of study (i.e., the presence of an abnormal return as a consequence of an information release), the central interest lies in the identification of the wealth effects that took place in the immediate vicinity of the event date.

When testing for the statistical significance of abnormal returns, hypotheses are implicitly testing for the presence of an "efficient" market in the sense proposed by the EMH. Testing the assumptions of the EMH hypothesis in its various forms[26] for the Mexican stock exchange represents an interesting endeavor.[27] But the scope of the present dissertation has a more general interest. Often times, objective statistical conclusions with respect to the degree (or form) of "efficiency" of the Mexican banks' stock prices behavior during the privatization period are reached; however, an interpretation of the nature and a measurement of the magnitude of the different event dates abnormal returns (including previous to the event date cumulative abnormal returns) is also a central interest.

As commented earlier, the equilibrium price of a security represents a simultaneous agreement of all market participants about its monetary worth. When a new piece of relevant information becomes available, market participants immediately incorporate it in to their decision-making rule. The result may well be a change in the equilibrium price, if the expanded set of information is capable of producing a variation on the demand-supply equilibrium relationship.

The argument that banks' stock prices behaved in an "efficient" manner, requires empirical support. To say, according to the semi-strong form of the EMH, that bank stock prices, rapidly and unbiasedly incorporated diverse official

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[26]Remember, from Chapter 1, that the EMH presents three different forms: the "weak" form, the "semi-strong" form and the "strong" form.

[27]To my knowledge, only Hakim [1992] has tried to test for the efficiency of the Mexican stock exchange. Hakim exclusively centered his attention on the "weak" form of the EMH, although he does not explicitly indicates it. In addition, he examined an earlier time period from this study.

information releases with respect to the privatization process is equivalent to the assertion that bank stock prices accurately and immediately reflected all available information during the privatization period. That is precisely the empirical evidence that needs to be analyzed and evaluated.

A conclusion that can be anticipated from the analysis is that in case the hypothesis tests derived from the EMH are not systematically rejected, investors could not have consistently obtained an extraordinary profit by trading on bank stocks during the privatization process, in particular, on the dates of public official announcements. An opposite argument can also be made if statistical results systematically reject the null hypothesis that bank stocks followed an efficient behavior during the period analyzed. Such evidence supports the proposition that investors were able to obtain extraordinary profits by, either speculating on the probable response of bank stock prices before an information release about the privatization decision had taken place, or by trading on "privileged information". It is impossible to establish which of the two possible explanations was effective, since no insider trading records exist for the Mexican stock exchange.

The mere possibility that insider trading can explain any recorded inefficiencies on the behavior of the banks' stock prices during the privatization period, should call the attention of regulators on the necessity of more effective controls to enforce the 1989 Law of the Securities Market, that bans "privileged" information trading.

A concrete need to detect the presence of privileged information illegal use is the implementation of a mechanism to record insiders trading to detect anomalies. This is the most effective way to prevent the use of non-publicly available information by those who have access to it.

Regulators in more developed markets have realized the importance of implementing adequate mechanisms to acomplish that kind of data recording. In an

emerging market, which is Mexico's case, the establishment of regulations and proceedings with the purpose to achieve that objective seems to me a step in the right direction.

7. EVENT DATES IDENTIFICATION

Official privatization information releases at different calendar dates supplied pieces of relevant information, which are expected to have produced a measurable wealth effect on bank's capital. (See Table 3.1A in the Appendix)

Different "event dates" can be identified during the banking system privatization process.

The most important are:

a) On May 2, 1990, the Mexican banking system privatization official announcement occurred. The announcement was considered an "unexpected" piece of information even to first level public officials and Congress members (Anda, 1992). From a stock market informational efficiency perspective, the privatization announcement had an immediate impact on investors' perception of each individual bank stock's equilibrium price. In fact, although the legislative process needed to provide formal support for the privatization still ahead, market participants interpreted the announcement as an important change in the longer term profitability and strategic perspectives of Mexican banks, which was immediately reflected in their stock market prices.

b) As was mentioned in Chapter 1, the privatization process took place through an auction mechanism which consisted of closed biddings delivered by potential buyers at the Treasury Ministry on a pre-specified date.

For a little over nine and a half months bank's stocks were traded under the expectation that the privatization event could take place at any moment, but without certainty of the exact date it would take place.

Controlling stock packages were submitted to private investors biddings at different dates. During the period from February 19, 1990 until March 27 1992, six auction announcements for different groups of banks took place.

While the auction mechanism was widely publicized, it also became clear that the privatization process was to be conducted in different stages. Given the magnitude of the resources involved, (an ex-post estimation of the total price paid by the new owners of the Mexican banking system well surpasses the amount of 12 billion U.S. Dollars) the Mexican authorities were concerned about the potential disruptive effects that the banks' privatization could have on the domestic financial markets, should it take place through a single operation (not to mention the complexity of the politically sensitive privatization management side of the process).

Authorities had to consider these concerns when the decision to choose the best solution was made. Given the complexity and diversity of the implications of privatizing the banking system, the Government decided to separate the banking system in groups of banks, each to undergo the established auction mechanism on a different date.

It is contended in this study that when the public announcement that a group of banks was to be privatized was made, a new piece of information relevant to the quotation of the banks' stocks was, in effect, released. The underlying argument is that uncertainty about the temporal sequence of the privatization process was eliminated on each public auction date announcement, because concrete dates for all interested contenders to present their bids for each bank were established.

c) Finally, a few days after the deliverance of the closed bids, the authorities publicly announced who the winner was, and what price the winning bidder offered to pay for each bank.

This information release represents still another "information event" for the bank's stock price quotation. In this case, the information content can be separated in two components:

1) The announcement of the identity of the winning bidder implicitly revealed fundamental facts about the bank's future growth potential in terms of the integration opportunities of the privatized bank with the acquiring group, and the management style and proficiency that could be expected.

2) The auction assignation announcement included another relevant piece of information to be carefully evaluated by market participants: the actual price that was offered by the winning bidder for the privatized bank's stock (as well as the non-winner bid information). Considering that the bidders who participated on each auction process received from the authorities a detailed set of confidential information containing financial, marketing and management data for the bank to be privatized, the official announcement of the price paid for the Government-owned controlling stock offered a reliable benchmark. It seems reasonable to think that once the announcement was made, market participants immediately compared it with its current market price. (See Table 3.2A in the Appendix) Actual or potential stockholders could then take an informed decision on if the bank's stock should undergo an adjustment or not.

From the EMH perspective, a meaningful re-evaluation (wealth creation or destruction) of the stock's market price was present every time a statistically significant deviation of the sale date market return with respect to the Market Model's estimation for the stock's "normal return" was observed. That is, a sale date abnormal return (either positive or negative) may consistently be attributed to the

market's participants new perception of the stocks future profitability potential, based on the sale date information release.

An understanding of the speed and mechanism of the Mexican bank's stock prices adjustment to new information can be gained by comparing the privatized banks' stocks prices abnormal returns significance and sign for the three above mentioned "event" dates.

Distinguishing between individual or group events has important implications. Specifically, the need to utilize one portfolio integration method for the sale date announcement and the May 2, 1990 event, and a different method for the effective sale date events. The reason is that on the first two events it is very likely that a high degree of cross-correlation was present among the banks' stocks involved. On the contrary, the effective sale-date was different for each bank and the argument that no cross-correlation was present among different banks' stocks seems reasonable.

When a high degree of cross-correlation of returns is expected to be present at a certain event date among a group of stocks, a common procedure developed by Mandelker [1974] and Jaffe [1974], according to Salinger [1992], is to group all stocks whose event window includes a particular day into a portfolio, to estimate the Market Model parameters for the portfolio, and then to estimate the portfolio abnormal returns.

Testing for the presence of abnormal returns in terms of the relative magnitude (significance) of residuals observed in two of the three event dates of interest follow the above mentioned structure. Specifically, the May 2, 1990 event and the auction announcement event dates were of the type in which information release simultaneously influences the behavior of several stock prices.

The opposite situation can be found in the case of the individual bank's sale date announcements, which took place at different calendar dates. To calculate abnormal returns significance for this event, Market Model parameters were individually estimated, abnormal returns were calculated for each stock and then combined into different portfolios.

8. PORTFOLIO INTEGRATION

The combination of different stocks into a portfolio yields a diversification effect that reduces the variance of returns. This has been called the "separation" of the unsystematic risk (or the risk that may be attributed to the special characteristics of a firm) from the systematic risk (that part of the returns variability that can be explained by common factors affecting every security in the market).

Tests of hypotheses regarding abnormal returns require the estimation of excess returns for a sample of securities. For events that take occur at the same time for all the securities, portfolio building eliminates the problem of cross correlation in the excess returns estimation that is statistically tested, thus allowing for a more objective evaluation of results. This argument does not pretend to invalidate the results obtained from a single stock's excess return statistical tests. It merely defines the conditions to achieve a better measurement of the excess return that can be attributed to an informational event of the kind studied here.

The testing of the hypotheses for the three different events rquires somewhat different methodology.

Three different portfolios were integrated for the May 2, 1990 event:

Portfolio 1: Contains the stocks of the four largest banks in the country (Banamex, Bancomer, Serfin and Comermex)

Portfolio 2: Contains the stocks of eleven, second level banks traded in the Mexican stock exchange during the privatization process period (notwithstanding their smaller operative size, this group contains several nation-wide branched banks).

Portfolio 3: Contains the whole set of fifteen banks with stocks traded in the Mexican stock exchange during the privatization process period.

The underlying reason for the first two portfolios is the intention to evaluate the response of the largest bank stock returns compared to the response obtained in the case of the second level banks. The third one is used to contrast the average response with each one of the first two subgroups.

The Auction announcement date set of events required the integration of six different portfolios. Each contained the stocks of those banks that were simultaneously announced to be auctioned in the near future and that had stocks traded at the Mexican stock exchange at the event time. The integration of this set of portfolios was the following:

Portfolio 4: Multibanco Mercantil de México, Banpais and Banca Cremi. In this case the announcement also included Banpais, but its stock was not publicly traded at that time, so it cannot be incorporated to the analysis.

Portfolio 5: Banca Confia, Banco de Oriente, and Banamex. In this case the auction announcement also included Bancreser, but its stock was not publicly traded at that time, so it cannot be incorporated to the analysis.

Portfolio 6: Bancomer only. In this case the announcement also included Banco BCH, but that bank's stock was not publicly traded at that time, so it cannot be incorporated to the analysis.

Portfolio 7: Banca Serfin, Comermex and Banco Mexicano Somex.

Portfolio 8: Banco del Atlantico, Banca Promex and Banoro.

Portfolio 9: Banorte, Banco Internacional and Bancen.

The Sale Date announcement event was analyzed with the same three portfolios used for the first event date. This time, for the purpose of sequency, they receive the numbers 10, 11 and 12.

The conditions prevailing in each of the event dates analyzed requires different alternative techniques to build portfolios. From the event study methodology perspective, the first date is different from the other two in the sense that the May 2, 1990, privatization announcement was relevant for the whole banking system, while the auction announcements and the effective sale date announcements occurred on different calendar dates for different banks.

Auction announcements were made for groups of two to four banks and, for that reason, the information release should have affected those banks included in the announcement simultaneously, generating a similar situation to the May 2, 1990 event.

9. THE ESTIMATION PERIODS SELECTION

Normal returns are expected to prevail over a period different from that immediately surrounding an event. If the fundamental determinants of normal returns are not expected to change due to the event, in order to avoid the influence

of the event information in the parameters estimated, an estimation period typically leaving aside a few observations close enough to the event date, is used.

Statistical tests to verify the presence of bank's stocks abnormal returns on May 2, 1990 were performed for four different versions of the Market Model estimated abnormal returns:

1. Market Model parameters estimation using 50 observations, from -30 through -6 and from +6 through +30, with respect to the event date (May 2, 1990)

2. Market Model parameters estimation for the same period, from -30 through -6 and from +6 through +30, with respect to the event date (May 2, 1990), using the Scholes and Williams' adjustment method to take account of the low frequency of transactions observed in the majority of the banks' stocks.

3. Market Model parameters estimation using 120 observations, from -150 through -30.

4. Market Model parameters regression estimation for the same period as the previous one, from -150 through -30, and using the Scholes and Williams' adjustment method to take account of the low frequency of transactions observed in the majority of the banks' stocks.

In general, it can be claimed that it is preferable to use a larger set of observations when estimating the Market Model parameters. Such statement is valid as long as the estimation period is not so long as to allow for the presence of instability of the parameters.

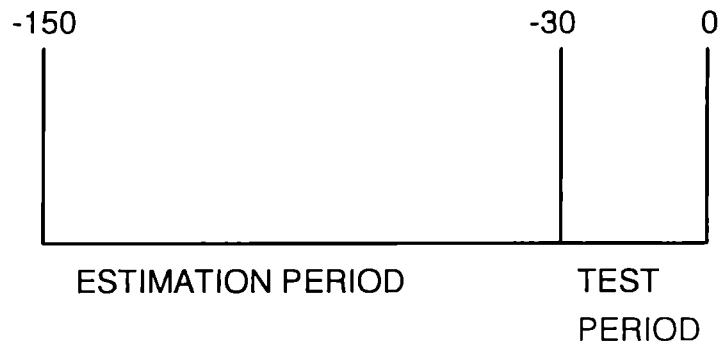
Unfortunately, it is impossible to integrate the portfolios 2 and 3 returns series for an observation period going further back than trading date -30, with

respect to May 2, 1990, since two bank's stocks (Multibanco Mercantil and Banco Mexicano Somex) were publicly offered for the first time just a few weeks before the banking system privatization announcement.

Market Model parameters estimation for both, the auction announcement and sale date events hypotheses tests was not affected by the problem of late public offerings. Estimation regressions were run using data for days -150 to -30 with respect to the corresponding event dates.

Since the auction announcement event's nature is of a multi-firm type, where intense cross correlation may be expected, the Market Model parameters estimation was based on the Mandelker and Jafee previous integration of portfolios technique.

In the case of the sale date announcement, individual banks' adjusted stock returns and the two above indicated market indexes returns are used to estimate the Market Model parameters. The parameters estimates are then used in combination with the market returns for days -30 to 0, to generate the Market Models' expected "normal" returns during the test period.



For the last two event dates, estimation of the Market Model's parameters was also performed twice. The first one without adjusting for thin trading and the second one with the SW adjustment technique.

10. DIFFERENT HYPOTHESIS TESTS PROPOSED TO ANALYZE THE PRESENCE OF SIGNIFICANT ABNORMAL RETURNS RESULTING FROM THE BANKING SYSTEM PRIVATIZATION OFFICIAL ANNOUNCEMENTS.

1. OFFICIAL INFORMATION RELEASE DATES

Null Hypothesis: **"There was no abnormal return present on bank stocks on the official privatization-related information release trading day."**

Alternative Hypothesis: **"There was, in effect, a significant abnormal return as result of the official privatization-related information release ".**

Rejection of the null hypothesis means that a statistically significant wealth effect resulted during the event day, and, thus, is congruent with the semi-strong form of the EMH. An important piece of information was released, and a re-evaluation of the banks' stock prices should be present during that day's market trading.

2. THE NEXT DAY OF AN OFFICIAL INFORMATION RELEASE

Null Hypothesis: **"There was no abnormal return on the next day of the Official Information Release"**

Alternative Hypothesis: **"There was, in effect, a significant abnormal return on the next day of the Official Information Release".**

Rejection of the null hypothesis reflects the importance that the announcement had for market participants. According to the EMH stock's prices should have incorporated the Official Information content of the announcements during the first trading session after the announcement. The wealth effect that was

generated by the announcement was so strong that one trading session was not sufficient for bank stock prices to fully adjust. According to the semi-strong form of the EMH, abnormal returns should not had been significantly different from zero, during the next day's trading session, in the absence of still another piece of relevant information. A rejection result should be considered as evidence that investors behavior was influenced by the previous day announcement and stocks' prices response.

This test was only performed for the banking system privatization announcement event. The reason was the evident inertial effect that can be measured for the abnormal returns on each of that event's portfolios (and individual stocks) for the "next day", or May 3, 1990.(Results are further commented in Chapter 4)

3. FOR TRADING DAYS PREVIOUS TO AN OFFICIAL "PRIVATIZATION-RELATED" ANNOUNCEMENT .

3. Null Hypothesis: **"There were not bank stocks prices cumulative abnormal returns present during the trading days previous to the official privatization-related announcement ".**

Alternative Hypothesis: **"There were, in effect, significant cumulative abnormal returns during the trading days previous to the official privatization-related announcement".**

I test this hypothesis over several alternative event windows.

FROM -30 TO 0.

Underlying the decision to test for the presence of abnormal returns in this event window is the graphical representation of observed deviations from regression estimates through the estimation and event window periods. When graphical representations were prepared for individual stocks as well as for different portfolios, there appeared to be a repeated regularity in their pattern. In all cases this trend pattern shows an important cumulative abnormal returns increase in the first half of the 31 days period previous to the event day, then curving down during the last fifteen days. (See Charts 3.1A through 3.6A in the Appendix)

A rejection of this hypothesis could be interpreted as an evidence that the strong form of the EMH is, in this case, statistically questionable. As mentioned in Chapter 2, the strong-form of the EMH assumes that insiders trading on privileged information produce all the necessary price adjustment in prices to reflect any relevant modification of the fundamental condition and returns perspectives of the company whose stock is traded.

This test is further analyzed dissagregated on its two component subperiods to offer a point of comparison of results. Given the opposite trends observed on the graphical representations of abnormal returns through this period, some interesting conclusions may derive from the statistical tests.

FROM DAY -30 TO DAY -16.

For this event window, rejection of the null hypothesis is interpreted as statistical evidence that cumulative abnormal returns were present, maybe as a consequence of insiders trading on privileged information. If a group of participants were aware of the privatization announcements before the rest of the market and, thus, were able to anticipate the likely impact the announcements could have on bank's stocks prices, their trading activities could have produced statistically significant abnormal returns through an increased demand or supply.

FROM DAY -15 TROUGH THE EVENT DAY (DAY 0).

Once again, the reason to test this hypothesis is that the graphical representation of abnormal returns through this event window suggests the presence of a surprising regularity in their behavior. Although a conclusive general assertion cannot be made with respect to the interpretation of a rejection result for this null hypothesis, an event by event approach can be tried.

For example, a possible explanation for rejection of the null hypothesis during this event window when tested with respect to the banking system privatization announcement is that after the accumulation period observed from the -30 through the -16 trading days with respect to the event date, and tentatively explianed as the result of insider's trading, the rest of the market participants, who did not have access to privileged information, were not convinced that the historically high observed quotations for the bank's stocks were justified, given the publicly available fundamental information. An increase in sales to profit from supposedly "overvalued" quotations could then have caused the -15 to -1 days declinning trend.

If the null hypothesis, when tested for the previous two event windows is rejected, but, at the same time, is not rejected for the -30 to 0 event window, the results may be interpreted as evidence supporting a peculiar manifestation of the strong-form of the EMH. That is, bank stock prices adjusted, in effect, to their equilibrium levels, eliminating any possible excessive returns, but only if a period long enough to allow for insiders trading to produce such an adjustment is analyzed.

FROM DAY -5 THROUGH DAY 0.

Rejection of the null hypothesis for this event window again implies that banks' stocks returns significantly deviated from the Market Model's expected

returns during the event window. This results are supportive of the suspicion that the privatization-related announcement event was not totally unexpected by some traders. If that is the case, since they had the opportunity to earn statistically significant abnormal returns by trading on privileged information, such result questions the strong form of the EMH. In other words, privileged information trading was not sufficient to produce prices that reflect private information, thus eliminating the opportunity to obtain abnormal returns.

IV. EMPIRICAL RESULTS

Information release effects observed in the behavior of bank stock prices during the different stages of the Mexican banking system privatization process, presented different degrees of intensity. From a statistical point of view, hypothesis tests provide a standard methodology to judge the significance of the deviations of the observed from the expected value of returns of banks stocks.

To test for the statistical significance of the deviations of observed returns, the expected value of returns is calculated as the estimated Market Model's forecast for a given market return.

Four different Market Models were estimated for each of the portfolios described in Chapter 3 (and in the case of the sale date event, for each one of the bank stocks). First, the Market Model was estimated with an OLS regression, for each one of the market indexes: the Banamex-30 and the IBMV. Then a "thin trading" adjusted Market Model was estimated for each version of the market indexes.

Most of the time, hypotheses tests of statistical significance outcomes were consistent for the abnormal results calculated with the different versions of the Market Model mentioned above. When results conflict, suggesting low robustness of the test, special circumstances are revised in order to give a satisfactory explanation.

1. THE PROBLEM OF "THIN TRADING".

The serious problem of thin trading observed among most of the stock issues traded in the Mexican stock exchange is a matter of concern for the methodology implemented on this work. The thin trading problem is present in all the economic sectors represented in the stock market, and, as was to be expected,

the banking sector is no exception.

As seen in Table 4.1, the frequency of trading for several of the banks stocks analyzed during the period of interest was considerably low in several cases (this is also evident for the sample as a whole). To get a more objective measure or the frequency of trading, an index of "thin trading" was calculated as the quotient of the number of days that the stock was not traded divided by the number of traded days from day -150, with respect to the official privatization announcement (May 2, 1990), through each individual bank saledate.

TABLE 4.1

BANK	NUMBER OF TRADING DAYS	NUMBER OF NOT TRADED DAYS	COEFFICIENT OF "THIN TRADING"
ATLANTICO	651	203	31.18%
BANCOMER	525	1	0.19%
BANAMEX	481	1	0.21%
BANCENTRO	694	127	18.30%
BANORIENTE	471	261	55.41%
BANORO	637	83	13.03%
BANORTE	679	13	1.91%
COMERMEX	593	573	96.63%
CONFIA	466	308	66.09%
CREMI	436	192	44.04%
INTERNACIONAL	689	0	0.00%
MERCANTIL	307	97	31.60%
PROMEX	633	210	33.18%
SERFIN	584	0	0.00%
SOMEX	518	62	11.97%
AVERAGE	557.6	142.1	26.92%

The main concern, from a methodological perspective, is that, in the presence of thin trading, stocks market prices adjust to reflect not only the effect of the information set available on the day of trading, but all the relevant information

that was not incorporated during the non-trading sessions, thus producing abrupt changes in prices.

In Chapter 2 it was indicated that the thin trading problem represents a source of bias in the estimation of the Market Model parameters. For that reason, the Scholes and Williams adjustment technique for thin trading was utilized, in parallel with the OLS estimate, for each version of the Market Model parameters estimates.

Thin trading can also induce a problem of serial correlation in the excess returns measures [Brown and Warner, 1985], as another consequence of the Market Model parameters estimation bias. Since serial correlation is likely to be present in a sample of observations with a serious incidence of no-trading days, this problem is taken care of, particularly when estimating the variance for cumulative abnormal returns, with the application of the Salinger's formula described in Chapter 3. Salinger [1992], finds that the use of the estimated Market Model parameters to calculate cumulative abnormal returns in a stock market event study represents a potential source of a serial correlation (auto regressive disturbances), and offers an adjustment formula to incorporate the effect of serial correlation in the calculation of the variance of cumulative abnormal returns. In that formula, the size of the parameter estimation component relative to the true error, depends on the length of the event window divided by the length of the estimation period.

The Salinger adjustment technique to take care of the serial correlation problem was used throughout all the tests of statistical significance of cumulative abnormal returns .

2. MARKET MODEL REGRESSIONS RESULTS

As was previously explained the application of the SW method requires running three regressions on each stock returns and market index returns series:

one with a lagged observation, one with a contemporaneous observation and one with a leading observation for the market index.

The purpose of presenting the OLS regressions results is to provide a general overview of the adequacy on the adjustment of the different Market Model estimates. Regression parameters for the lagged and leading market returns series observations do not have a meaningful interpretation. Their function is that of an instrumental variable, and no interpretative objectives are considered. That is the reason for only reporting the contemporaneous regression (OLS) results for all the estimated models.

1. PRIVATIZATION ANNOUNCEMENT EVENT (MAY 2, 1990)

a) Event study research works use different lengths for the estimation period of the Market Model parameters. An aspect that must be carefully evaluated when deciding the length of the estimation period is that the number of observations is enough as to incorporate sufficient information into the regression models. That objective must be balanced with the possible unstability of the parameters that results when an excessively long estimation period is used.

From the statistical point of view, a period of 120 daily observations is adequate to estimate the regression parameters of the Market Model. That number of observations represents a duration that is usually not as long as to permit the emergence of fundamental changes that can modify the market risk of the stock or portfolio for which the Market Model is estimated.

For such reasons, a 120 observations estimation period was utilized in most of the Market Model parameters estimates, with only one exception. The exceptional case is due to the lack of enough observations as a consequence of a late public offer of the stocks of two of the banks.

The official banking system privatization announcement took place only a few weeks later than the first public offer of the stocks of Multibanco Mercantil de Mexico and Banco Mexicano Somex in the Mexican stock exchange took place. That circumstance limited the number of available market return observations previous to the first event date of interest.

For the purposes of this work, the late public offer of Mercantil and Somex stocks reduces the sample size of banks for which an information impact measurement is feasible when the 120 observations period of Market Model estimation criteria is maintained. But, since the number of banks that constitute the sample is already small, an alternative approach was followed.

In an attempt to overcome the sample size reduction, two different versions of the Market Model were estimated to test the significance of the abnormal returns observed during the banking system official privatization announcement date, and the days surrounding that event.

First, a total of six Market Models for three portfolios and two market indexes, and for an estimation period covering the -30 to -6 and +6 to +30 period, with reference to the event date (May 2, 1990), were calculated. Although the extent of the event window used to test for the presence of significant abnormal returns is limited in this case to only 11 days (five days before and five days after the event date, besides the event day itself), these models estimates and abnormal returns information are included because they represent a benchmark. The relevant feature of these Market Model estimates consists in that the totality of the fifteen bank stocks sample was included.

Other six regressions were run for a longer period of 120 observations, from the day -150 through day -30, with respect to the event date. Statistical significance tests could, thus, be performed for a longer event window (from the day -30 to the event day). The actual analysis aimed to evaluate the significance of

abnormal returns was performed on these 120-observations-estimation-period models and abnormal returns. Nevertheless, it is important to insist on the point that the number of banks that formed part of the portfolios used to estimate Market Model parameters and abnormal returns was, in this case, smaller, since Mercantil and Somex banks were excluded.

The length of the event window is particularly important in the analysis of this event date and previous trading days period because of the need to count with the data to measure the statistical significance of a suggesting pattern observed on the graphical representation of abnormal returns, for most of the bank stocks considered in the sample. During the -30 to 0 trading days the seemingly parallel pattern was persistent when a graphical representation for groups of stocks (portfolios) was prepared.

In essence, the two main differences among the set of 120-observations-estimation-period models and the set of the 50-observations-estimation-period models are:

1) That in the case of the 120-observations-estimation-period models, the integration of portfolios 2 and 3, left out two stocks out of the sample: Multibanco Mercantil and Somex.

2) That the estimation period was 70 observations longer.

For the 50 observations regressions, the explanatory capacity of the model was very good in all cases. Adjusted R^2 was consistently higher for the Banamex-30 index (average value .48231), with respect to the IBMV (average value .19666). All regressions were significant to the 0.5% level and the average Beta value was 1.038. (see Table 4.1A, in the Appendix)

The explanatory capacity for the models was still better for the 120 observations regressions. The average adjusted R^2 for the Banamex-30 index was .65310, while for the IBMV regressions the average was .46754. Again, the F test for all the regressions was highly significant (see Table 4.2A, in the Appendix).

Given the low frequency of trading (see Table 4.1), the need to correct the potential bias on the estimation parameters is evident. The SW adjustment technique was used because, as it was explained in Chapter 3, a careful revision of the arguments in favor and against the different adjustment techniques to take care of the thin trading problem found a consistent agreement among different authors about the adequacy of the SW technique (McInish and Wood, 1986; Brown and Warner, 1985; Fowler and Rorke, 1983).

When the SW adjustment technique is used the average value of the beta coefficient of the models is decreased in 10.64%, for the 50 observations models, while an average increment of 5.35% is observed for the 120 observations models.

TABLE 4.2

Systematic risk parameters (betas) for the Market Model.
Event Date: Banking System Privatization announcement.
Estimation period: -30 to -6 and +6 to +30.

Portfolios*	OLS Beta	SW Beta	Difference
Portfolio 1 w/Banamex-30.	1.6068	1.7699	10.15%
Portfolio 1 w/IBMV.	1.2309	0.7878	-36.00%
Portfolio 2 w/Banamex-30.	0.9018	1.4719	63.22%
Portfolio 2 w/IBMV.	0.6293	0.1565	-75.13%
Portfolio 3 w/Banamex-30.	1.0898	1.0723	-1.60%
Portfolio 3 w/IBMV.	0.7897	0.3248	-58.86%
AVERAGE	1.0414	0.9306	-10.64%

TABLE 4.3

Systematic risk parameters (betas) for the Market Model.
Event Date:Banking System Privatization announcement.
Estimation period:-150 TO -30.

Portfolios*	OLSM Beta	SW Beta	Difference
Portfolio 1 w/Banamex-30.	1.3036	1.2017	-7.81%
Portfolio 1 w/IBMV.	1.3166	1.2606	-4.25%
Portfolio 2 w/Banamex-30.	0.9223	1.0469	13.51%
Portfolio 2 w/IBMV.	0.8408	1.0407	23.78%
Portfolio 3 w/Banamex-30.	1.0396	1.0946	5.28%
Portfolio 3 w/IBMV.	0.9872	1.1084	12.27%
AVERAGE	1.0684	1.1255	5.35%

*For both, tables 4.2 and 4.3, Portfolios numbers refer to the integration proposed in Chapter 3.

2.- "AUCTION ANNOUNCEMENT" EVENT DATE.

The "auction announcement" event affected different groups of banks at different calendar dates. To test for the presence of abnormal returns surrounding these dates, twelve Market Models were estimated with OLS regressions (six portfolios vs. two market indexes). As explained in Chapter 3, the different portfolios were integrated by including in each one a group of banks whose auction announcement was simultaneous.

There was a special case: portfolio number 6, which corresponds to the auction announcement that was officially publicized on July 26, 1991. On that date,

the auction of Bancomer and BCH was officially announced. Since BCH stock had not been publicly placed at the time, the only stock for which a market return can be measured in order to form part of a portfolio to estimate the Market Model and the significance of abnormal returns is Bancomer's. For that reason, portfolio number 6 is a "one stock portfolio".

Regressions for the announcement date portfolios and the Banamex-30 index yield a reasonably satisfactory average adjusted R^2 of .29107, while the average for the IBMV regressions was much lower, .14361. While in most of the models estimated for this event the significance level of the F test regression was less than 1%, that same statistics for the regressions of portfolios numbers 7 and 8 against the IBMV index were significant at the 7.5% level.

In contrast to the values observed when the same portfolios are regressed against the equally weighted index (Banamex-30), the adjusted R^2 for the regressions using the IBMV was considerably smaller than for the rest of the regressions using the IBMV. (see Table 4.3A in the Appendix).

Again, it is important to insist on the need to use a SW adjustment for the estimated Market Model parameters. The average beta value for the OLS estimates of the twelve models was .568953, while the average SW adjusted beta was slightly lower, 0.51875.

TABLE 4.4.

Systematic risk parameters (betas) estimates.

Event date: Auction announcement

Estimation period: from -150 to -30.

Portfolios	OLSM Beta	SW Beta	Difference
Portfolio 4 w/Banamex-30.	0.45546	0.59118	29.80%
Portfolio 4 w/IBMV.	0.43189	0.56206	30.14%
Portfolio 5 w/Banamex-30.	0.32434	0.37517	15.67%
Portfolio 5 w/IBMV.	0.28369	0.31811	12.13%
Portfolio 6 w/Banamex-30.	1.10762	0.91061	-17.79%
Portfolio 6 w/IBMV.	0.60567	0.37686	-37.78%
Portfolio 7 w/Banamex-30.	0.55845	0.334291	-40.14%
Portfolio 7 w/IBMV.	0.1753	0.031278	-82.16%
Portfolio 8 w/Banamex-30.	0.64308	0.68047	5.81%
Portfolio 8 w/IBMV.	0.24271	0.10233	-57.84%
Portfolio 9 w/Banamex-30.	1.16347	1.18609	1.94%
Portfolio 9 w/IBMV.	0.83575	0.75654	-9.48%
AVERAGE	0.56895	0.51875	-8.82%

3.- "SALEDATE" OR "ASSIGNATION" DATE EVENT.

The sale date announcement was a different calendar date for each bank. For that reason, the presence of cross-correlation is expected to be minimal among abnormal returns.

The portfolio integration technique suggested in this case is to estimate the individual Market Model parameters (individual stock vs. market index regressions), calculate the estimation errors, (which are equivalent to abnormal returns), and combine them in different portfolios. Statistical significance tests for abnormal returns are then performed on each portfolio.

The F statistic was significant to a 2% level for ten out of the fifteen regression models. Within this group of highly significant regressions, the adjusted R^2 values were in the range of .4154 for Serfin to .0440 for Somex when the regressor was the Banamex-30 index. Again, the quality of adjustment for the IBMV regressions was lower, with adjusted R^2 values going from .2250 for Banorte to .0462 for Banamex. (See Table 4.4A in the Appendix)

The regression models estimated for Banorie, Confia, Cremi, Mercantil and Promex present a very small explanatory ability. The F test significance levels were often over 50% and the adjusted R^2 was most of the time under .01. Notably, the stocks belonging to this group are those presenting the most serious thin trading problem. All of them have a thin-trading index of more than 30%. (See Table 4.1)

Differences in the values of the OLSM and the SW adjustment for thin trading estimation method for the Market Model systematic risk parameters show and all-over average increase of 20.50%. Individual differences were much more important in relative terms. Again, the largest differences correspond to those stocks suffering from a serious thin trading problem: Banorie, Confia, Cremi,

Mercantil and Promex. Most of the time, a clear pattern can be discerned in this subgroup. The SW beta adjustment direction considerably increases the value of Beta, except for the Promex Market Model with the IBMV. (See Table 4.5A in the Appendix)

Since the bank stocks contained in the database present a serious "thin trading" problem, the more adequate estimation of the Market Model parameters requires the use of a method of adjustment. For that reason, in what follows only the Scholes and Williams adjusted results are reported. Not every bank stock presents a thin trading problem, but the great majority does. The SW method of adjustment was used in all cases to avoid any essential differences in the tests performed.

Hypothesis tests results based on the Market Model estimates without the SW adjustment for thin trading are presented in the Appendix for comparison. In almost all cases, non-adjusted results validate the conclusions reached when the SW adjustment technique was utilized.

3. NON-NORMALITY OF THE STATISTICAL DISTRIBUTION OF RESIDUALS .

Return Generating Models that incorporate market risk and firm specific risk usually use the Ordinary Least Squares technique to establish a linear relationship between individual securities (or portfolios) returns and market returns. The use of the OLS technique in finance has frequently been criticized because of the violation of one of the model's statistical assumptions: that of normality in the distribution of the error terms. The OLS requires error terms (abnormal returns) distribution to be normally behaved (mean=0 and standard deviation=σ), but, as already mentioned in Chapter 2, the empirical evidence seems to contradict that assumption, particularly when the periodicity of the returns measurement is daily.

In several studies that were cited in Chapter 2, distributions of daily returns are found to have more observations both in their central portions and in their extreme tails than is expected from normal distributions. Additionally, Brown and Warner [1985] confirm that the lack of normality in the distribution holds true for daily excess returns. Departures from normality are reported less pronounced for cross-sectional mean excess returns than for individual security excess returns. Anyway, as I mentioned before, their simulation results confirm that the non-normality problem does not significantly modify their tests results.

The estimation error can be thought of as representing the combined effect of a large number of independent variables, which are not explicitly introduced in the regression model. According to the Central Limit Theorem:

> . . . it can be shown that if there is a large number of independent and identically distributed random variables, then, with a few exceptions, the distribution of their sum tends to a normal distribution as the number increases indefinitely. (Gujarati, 1978).

Empirical tests show that such is not the case. What can be said is that "It is a property of the normal distribution that any linear function of normally distributed variables is itself normally distributed". But if the Market Model is based on the observed values of a market index and a security's price, and both variables distributions substantially deviate from normality, then, their linear combination is also expected to behave non-normally.

Brown and Warner [1985] also report that departures from normality are less pronounced for cross-sectional mean excess returns than for individual security excess returns. This result is consistent with the Central Limit Theorem, because if excess returns in a cross-sectional sample of securities are independent and identically distributed drawings from finite variance distributions, the distribution of

the sample mean excess returns converges to normality as the number of securities increases. The authors comment that "These differing results for different sample sizes raise the possibility that the degree of misspecification in the event study methodology is sensitive to sample size."

Another basic conclusion of the Brown and Warner daily returns study is that "The non-normality of returns has no obvious impact on event study methodologies." Although daily excess returns are highly non-normal. they find evidence that the mean excess return in a cross-section of securities converges to normality as the number of sample securities increases. Dyckman, Philbrick and Stephan [1984] also present results that support the accuracy of the t-test to detect the presence of abnormal returns, although distributions of daily returns residuals are clearly non-normal.

The series of abnormal returns (deviations from expected values) obtained with the different Market Models estimated were statistically analyzed. Results to evaluate the normality of their distribution were consistent with the above mentioned deviations from normality for daily excess returns in most cases.

Three statistics were used to test the normality distribution of residuals: kurtosis, skewness and studentized range.

Kurtosis is a measure of the peakedness of the observed distribution. A value of zero for this statistic corresponds to a normal distribution. As the kurtosis value diverges towards positive values, the distribution analyzed concentrates a larger proportion of observations close to its central values than would be expected from a normal distribution. The contrary conclusion holds when the kurtosis values are negative.

Skewness measures the degree to which a given distribution is symmetrical. Again. a value of zero represents the expected skewness for a normal

distribution. Positive values of skewness mean that a higher proportion of extreme observations are concentrated to the right of the mean.

The studentized range is a measure of normality based on the standardized value of the observations. This value, is contrasted with the value expected for a sample of the same size, that follows a normal distribution. This test statistic allows the measurement of the probability that a calculated abnormal return value is observed when a sample of the same size belongs to a normal distribution.

Residuals for the May 2, 1990 models are in general more peaked than could be expected if they belonged to a normal distribution. In most cases measured kurtosis is larger than three standard deviations above the mean. The only exception is the case of the 15 banks stocks aggregated porfolio model estimated on 50 observations, whose kurtosis values are within 1.5 standard deviations from the mean. If this result could be considered as evidence supporting the Brown and Warner's argument that the distribution of the sample mean excess returns for a portfolio converges to normality as the number of securities in the portfolio increases (Central limit theorem), the kurtosis measured values for the deviations of the 150 observations estimated models for the same event date, seem to contradict that conclusion. (See Table 4.6A and 4.7A in the Appendix)

Skewness calculated values fall out of the range of three standard deviations above the mean for the 50 observations model deviations, evidencing the presence of a strong positive skewness. By contrast, as the sample grows to 120 observations, calculated skewness values fall, in all cases, within the range of one standard deviation above of the mean.(See Tables 4.6A and 4.7A in the Appendix)

Studentized range values for the 50 observations estimated Market Model deviations fall in all cases within the 95% confidence level. Contrary to these results, the same test performed for the 120 observations model produces values

that are observed with a frequency of less than .10% of the time when the sample comes from a normal distribution in all cases. (see Tables 4.6A and 4.7A in the Appendix).

Announcement date Market Model residuals statistics reject the hypothesis of a normal distribution. Kurtosis values are well beyond three standard deviations from the mean in most cases, a most improbable result when observations belong to a normal distribution. Skewness values deviate from the expected normal values in a less pronounced way, but still lie out of the mean plus/minus three standard deviations range for half of the estimated Market Model residuals.(See Table 4.8A in the Appendix)

Studentized values reject in all cases, except one, the hypothesis that residuals come from a normally distributed population, with a significance level 95%. (See Table 4.8A in the Appendix)

Saledate models residual analysis, once again, confirms the significant deviation from normality for the abnormal returns statistics values. Kurtosis is generally positive and most frequently larger than three standard deviations above the mean expected value for a normal distribution. For the very low trading stocks, the values of kurtosis rise considerably. In these cases abnormal returns kurtosis reach excessive values. For example, Confia kurtosis measures are close to 58 for both market indexes models. Another excessively high kurtosis corresponds to the abnormal returns for Cremi, whose value is close to 15.(See Table 4.9A in the Appendix)

Skewness values are not so far away from the normal mean, for this event date abnormal returns, although still fall outside the range of three standard deviations in most cases. A notable exception are the cases of Confia and Cremi, seriously affected by the thin trading problem stocks, that present skewness values

several dozens of times larger than the mean skewness value for the rest of the sample. (see Table 4.9A in the Appendix)

Studentized range values fall outside the range of a 95% two-sided test in all cases with the exception of two stocks: Bancen and Banoro. (see Table 4.9A in the Appendix).

4. HYPOTHESIS TESTS RESULTS AND INTERPRETATION.

The hypothesis tests proposed in Chapter 3 were performed on the abnormal returns calculated for the three event dates, and for the cumulative abnormal returns surrounding the event date windows.

The hypothesis were tested for each of the different groups of stocks integrated (portfolios) and for both Scholes and Williams adjusted Market Model estimations: those using an equally weighted index, and those using a value weighted index.

Additionally, hypothesis were tested for individual stocks abnormal returns for the saledate (assignation) event. The reason to report individual tests is that, although when significance of abnormal returns were tested no evident informational impact could be detected, when each stock's abnormal return was tested interesting results arise in terms of significance. In some cases, reference is made to the non-adjusted for thin trading Market Model estimations, only for comparison purposes.

In general, the significance level or probability of error Type I (to reject the null hypothesis when it is true) used to reject a null hypothesis was 5%, for a two tailed test.

1. PRIVATIZATION ANNOUNCEMENT EVENT (MAY 2, 1990)

The presidential initiative to privatize the Mexican banking system was announced early, in the morning of May 2, 1990. The news rapidly spreaded out and reached every corner of the country. Once trading operations started the strength of the news effect was evident. To give an idea of the importance of the psychological impact that the privatization announcement produced it is sufficient to mention that the market returns measured by both the Banamex-30 and the IBMV were 6.2% and 4.5%, respectively. When compared to the average daily return for both indexes during the previous 30 trading days, of 0.6% and 0.4%, again respectively, that perception is confirmed. The vast majority of the issues traded were positively affected by the optimistic mood generated by the announcement.

Among the most intensely traded stocks on that day were, evidently, banks stocks. This group of stocks' returns were spectacular, without doubt. On the day of the announcement the average return for the fifteen traded bank stocks was 11.17% and the next day it represented an additional 8.44%.

The Central Hypothesis to be tested for this event date is that the response of the banks stocks prices to the announcement was immediate and significantly abnormal, from a statistical perspective.

The particular hypotheses, stated to be rejected in order to support the assertion that an informational impact was statistically identifiable following the announcement, are that no informational impact could be detected whatsoever, when different "event windows" are considered.

The hypotheses tested were:

1. Null Hypothesis: **"There was no abnormal return present on bank stock prices during the banks privatization official announcement trading day."**

Alternative Hypothesis: **"There was, in effect, a significant abnormal return as result of the banks privatization official announcement".**

In the first place, results obtained indicate that the length of the estimation period does not result in a meaningful difference on the outcome of the tests. In ten out of twelve cases, the abnormal returns calculated reject the null hypothesis at a 4% significance level, for a two tailed test. (See Tables 4.10A through 4.13A in the Appendix)

When the standard deviation of the forecast is used to test the significance of the results, the significance level is slightly increased. Specifically, in the case of model 9, the probability to reject the null hypothesis when it is true, increases to 4.9%, still a satisfactory level of significance.

It was not possible to reject the null hypothesis at a 5% significance level in two cases:

1. Portfolio 1 abnormal returns for the Market Modek estimated with 50 observations regressed against the Banamex-30 index deviate from zero with a level of significance of 3.8% for the event date, before the standard deviation is adjusted to take into account the fact that the expected return calculation is based on a "forecast" value for the market index. But when the forecast adjustment is introduced, the significance level for this test increases to more than 5%.

2. A special case also arises for the 50 observations Marekt Model estimated for Portfolio 2, regressed against the Banamex-30 index. The probability of Type I error for the test performed on this model's abnormal returns was

considerably higher, when compared with the rest of the models. The "t" value using a standard error without the adjustment for the forecast is only .0416 (.3289 when the forecast adjusted standard error is used). The probability to reject the null hypothesis when it is true is in this case higher than 25%. In consequence, the null hypothesis was not rejected. It is interesting to notice that the same hypothesis was rejected with 5% significance when the 120 observations estimate for the Market Model parameters is used.

Two possible explanations arise with regard to this case. The first one refers to the different integration of the portfolios used to estimate the model. In the 50 observations estimated model the Multibanco Mercantil and Banca Somex are included, while in the 120 observations estimated model, those stocks are excluded because of data unavailability. That is a possible explanation of the different results of the hypothesis tested.

In a way, it is perplexing that the 50 observations SW adjusted model was not able to reject the null hypothesis, since the Portfolio 2 returns on the event day were very high (more than 10%). Even more strange is the fact that the unadjusted for thin trading 50 observations model did reject the null hypothesis with a 1% significance. It seems as the SW adjustment was not "beneficial" this time. It is also evident that a longer estimation period achieves a more precise measure of the significance of abnormal returns, as would be expected.

2. Null Hypothesis: **"There was not an abnormal return present on the next day of the banks privatization official announcement."**

Alternative Hypothesis: **"There was, in effect, a significant abnormal return on the next day of the banks privatization official announcement".**

On the next day of the privatization announcement, the market again showed a strong bullish trend. The bank stocks were specially notorious, reaching

an 8.44% return in average, still a very high level. The magnitude of the accumulated wealth effect in those two days was, indeed, very large. The observed abnormal returns were 3.1% and 4.8% for the whole sample portfolio (Portfolio 3), when the SW Market Model with 120 observations was used with the Banamex-30 and the IBMV, respectively. (See Table 4.13A in the Appendix)

Rejection of the null hypothesis with a 1% significance level was straightforward in nine cases. The only exceptions correspond to Portfolio 1, with and without the SW adjustment (Model 1), and Portfolio 2, when the SW adjustment is utilized (Model 3). In the first case, standardized abnormal returns present a significance level close to 50% (43% before the standard error is adjusted for the forecast effect), and, thus, cannot be rejected. In the second case, abnormal returns had a 30% significance level (25% before adjustment for the forecast), still a very high probability to reject the null hypothesis when it is true.

3. Null Hypothesis: **"There was no cumulative abnormal return for trading days event window previous to the Banking System Privatization official announcement"**

Alternative Hypothesis: **"There was, in effect, a significant cumulative abnormal return for trading days previous to the Banking System Privatization announcement".**

FROM DAY -30 THROUGH THE EVENT DAY (DAY 0)

Cumulative abnormal returns tests results are very interesting for this period. In particular, the -30 to 0 cumulative returns period offers a point of comparison with the -30 through -16 and the -15 through 0 sub periods. Since the period analyzed in this case is equivalent to the aggregation of the two sub periods indicated, the divergence obseved on the statistical conclusions must be conciliated with an objective interpretation.

The models that reject the hypothesis with a 5% significance level are only two, out of six. It is interesting to note that the null hypothesis was rejected for models' 11 and 12 abnormal returns, corresponding to the whole sample portfolio regression with the Banamex-30 and the IBMV indexes, respectively

The cumulative abnormal returns that could not be considered significantly different from zero from a statistical point of view, presented a probability of rejecting the null hypothesis when it is true of as much as 15.3%, in the case of Portfolio 2 regressed with the IBMV (Model 10).

FROM DAY -30 THROUGH DAY -16

As it was commented on Chapter 3, the reason to test this hypothesis was the observation of the graphical representation of cumulative abnormal returns for portfolios and individual stocks. When the graphical representation was prepared for each bank's stock, there appeared to be a constant pattern in all cases. That pattern suggested an important positive deviation of observed with respect to expected returns for the -30 through -16 sub period and a return-downwards trend for the -15 through 0 sub period. Graphical evidence gave an intuitive idea of what had happened, but a more formal contrasting, namely a test of hypothesis. That is the reason that this and the following hypothesis tests were included in the results report.

The hypothesis that the cumulative abnormal return during the -30 through -16 days period analyzed was equal to zero is consistently rejected for all the models (7 through 12) with a 3.5% significance level.

FROM -15 THROUGH THE EVENT DAY (DAY 0)

This hypothesis is complementary to the previous one. Again, the reason to formulate this hypothesis was that the graphical representation of

cumulative abnormal returns during the previous month to the event suggested the presence of a constant pattern across different banks stocks.

Cumulative abnormal returns calculated with model 11 (whole sample portfolio regressed with the IBMV) were in the order of -8.4%. This value was significantly different from zero with a probability of rejecting the null hypothesis when it is true (Type I error) of only 4.5%. The rest of the models had significance levels that could not reject the null hypothesis. It is worth mentioning the fact that in all cases cumulative abnormal returns were very negative, in the order of -8.2% or less, but when contrasted with the high variability of abnormal returns, no statistical significance at the 5% level could be found.

FROM DAY -5 THROUGH THE EVENT DAY (DAY 0)

Cumulative abnormal returns were not found to be significant, with a probability of 5% to reject the null hypothesis when it is true, in 9 of the twelve tests performed. The only exceptions were for models 2, and 6 with SW adjustment. These models correspond to the 50 observations set of estimates, and, interestingly enough, both use the value weighted index for the Market Model OLS estimation. The probability that confidential information reached the market during the five days previous to the event date is high. Actually, abnormal returns were to be expected during this event window. The fact that only two models out of six could detect the statistical presence of significant abnormal returns is illustrative of the value of performing an event study with different analytical tools.

2.- "AUCTION ANNOUNCEMENT" EVENT DATE.

The auction mechanism selected to privatize the banking system was an already standard procedure. There was a long list of state-owned privatized

enterprises during the previous eight years. A distinctive feature of this process was the number of firms of the same industry that were being privatized and the magnitude of financial resources involved.

The political relevance of the decision was carefully shaped by the government through the media to generate support towards an ideological position that was contrary to what eight years before had been an act of "sovereignty" and punishment to those that "had promoted the disastrous capital flight" of 1982. A central aspect that had to be taken care of was the public opinion certainty of the transparency of the privatization process. This was a clue point because it was necessary to eliminate any criticism opportunity for the privatization opposers.

The financial implications of the privatization process were also carefully evaluated. The economic stabilization plan that had finally curved down inflation two years before was probably still vulnerable to extraordinary circumstances. The magnitude of financial resources involved in the banks privatization transactions was important enough as to be considered a possible unstability factor in the domestic money market, that could send some erroneous signals to participants through unexpected increases in interest rates. This could negatively influence the already generalized expectations of a down-turning of inflation and represent an undesirable indirect cost of the banks privatization.

For all those reasons the privatization processs of the Mexican banks was implemented in different phases. Each phase was separated by several months and included at much, the privatization of 4 banks. Once a group of banks had been sold an announcement was made for the next group.

The central hypothesis proposed to analyze the impact of the different auction announcements is that the market reaction to the information release of which banks were the next in the list had a significant impact on the stocks returns of those banks included in the announcement.

The particular hypotheses, stated to be rejected in order to support the assertion that an informational impact was present are the following:

4. Null Hypothesis: **"There was no abnormal return on the day that a group of banks auction announcement was officially released"**

Alternative Hypothesis: **"There was, in effect, a significant abnormal return as result of the official auction announcement".**

Statistical tests implemented to detect the presence of abnormal returns on the day the announcement was made gave mixed results (See Table 4.15A in the Appendix). Four out of twelve models reject the null hypothesis of zero abnormal returns, with a significance level of 0.5%. These corresponded to the Banamex-30 and IBMV models for the first group of banks auction announcement (Portfolio 4 in Chapter 3), and to the fourth group of banks auction announcement (Portfolio 7 in Chapter 3).

5. Null Hypothesis: **"There was no cumulative abnormal return during the trading days previous to the auction official announcement"**

Alternative Hypothesis: **"There was, in effect, a significant cumulative abnormal return during the trading days previous to the auction official announcement".**

FROM -5 THROUGH THE EVENT DAY (DAY 0)

This hypothesis was rejected for Portfolios 4 and 7, with a 1% significance level. In contrast with this result, the rest of the portfolios did not record statistically significant cumulative abnormal returns (with a significance level of 5%).

Other event windows analyzed during the -30 to 0 trading periods do not reject the null hypothesis of zero abnormal returns as a result of the auction announcement of the different groups of banks.

3.- "SALEDATE" OR "ASSIGNATION" DATE EVENT.

In Mexico, banks publicly traded in the stock exchange publish financial statements on a monthly basis. During the period the banks were state-owned, their administration acquired political relevance. Public officers were often appointed as banks presidents and were interested in the diffusion of their management successes, perhaps with a longer range political projection of their career in mind. The public incumbent declarations and relevant data releases were more frequent than during the private-owned period. Nevertheless, the degree of confidentiality of the information releases was not much different from what it had been during the private-owned period. Each bank zealously kept a good amount of confidential information away from the public media. For that reason the information release that accompanied the official assignation of each privatized bank should influence the investors perception of the worth of the banks stock, because until that moment it had been "highly confidential".

The auction mechanism included the delivery of highly detailed confidential information to the potential participants. In order to obtain the confidential file, the interested parties had to make a considerably high deposit, somewhat in the order of 33 million of U.S. Dollars. The deposit was made to guarantee the seriousness of the intentions of the bidder, but also to prevent the misuse of the information, in particular, an irresponsible use of it.

Among the relevant data contained in those files was a careful evaluation of the credit portfolio of each bank, markets and strategic information, as well as detailed managerial and operational aspects. Another important piece of information was the composition and conditions of each bank's liabilities, both in

Mexican and in foreign currency. More detailed information allowed for further analysis of the financial situation than was feasible based on published statements. It is reasonable to think that this confidential information was rich enough in content to re-elaborate the publicly available financial information with a more informed valuation criteria. Although the auction-package of confidential information was never released to the media, the winning bid was expected to reflect a highly professional valuation of each bank's worth.

A rational expectations approach to the saledate event would support the argument that when the winning bid and the price effectively paid for the banks controlling stock position was made public, it would represent a very valuable piece of information for the market participants trading on the banks stock, and result in an informed re-appraisal of the stocks market valuation.

The central hypothesis to be tested with respect to the bank's stocks performance on the assignation or saledate event is that a strong form market efficiency was present. In other words, if privileged information trading was sufficient to establish an equilibrium stock price that reflected all the historical, public and privately owned information relevant to its valuation, no abnormal return should be present on the saledate or the surrounding event window.

As explained on Chapter 3, to test this hypothesis, three portfolios were integrated, with the same composition of the portfolios used to test the hypotheses referred to the banking system official privatization announcement.

Several hypotheses were tested to evaluate the presence of statistical significance on the event date and surrounding event window calculated abnormal returns. But except for the rejection of the null hypothesis that stated that no significant cumulative abnormal returns were present during the 15 days previous to the saledate event plus the event date itself (from day -15 through the event day),

no other statistically significant abnormal returns were detected, for any of the portfolios, at a 5% significance level. (See Tables 4.16A and 4.17A)

Although the portfolio's abnormal returns tests results for the saledate event are supportive of the EMH strong form, hypothesis tests at the individual level yielded some unexpected results. Only those cases where a particular hypothesis was rejected with a 5% significance level are reported here, although the whole set of tests, both with and without the SW adjustment are included in the Appendix (See Tables 4.18A through 4.32A in the Appendix). In particular, the following hypotheses were evaluated:

6. Null Hypothesis: **"There was no abnormal return on the date of the official assignation of the auctioned bank to the winning bid".**

Alternative Hypothesis: **"There was, in effect, a significant abnormal return as result of the official assignation announcement".**

7. Null Hypothesis: **"There was no cumulative abnormal return during the trading days previous to the date of the official assignation of the auctioned bank to the winning bid".**

Alternative Hypothesis: **"There was, in effect, a significant cumulative abnormal return during the previous trading days to the official assignation announcement date".**

This hypothesis was tested for the -30 through 0 and the -15 through 0 cumulative returns sub periods.

1) **Banco del Atlantico**'s stock abnormal returns statistical significance was very low for the three hypotheses. In all cases the null hypothesis is rejected

with a significance level (probability of a Type I error) of less than 3%. The positive abnormal returns that were present for at least a 30 days period previous to the saledate announcement (33.4% and 41.8% when the bank stock returns are regressed against the Banamex-30 and the IBMV, respectively) reflect a consistent revaluation of the stock's worth before its definite privatization.

2) For **Banco de Oriente** (BANORIE) negative significant abnormal returns were observed on the -15 to 0 event window when the IBMV calculated Market Model is utilized to measure abnormal returns. Cumulative abnormal returns calculated were important for the Banamex-30 model, almost -6.7% for the same event window. But the IBMV cumulative negative abnormal returns effect was almost twice as large, -13.6%. Important negative abnormal returns were present during the 31 days event window (-7.5% for the Banamex-30 model and -13.0% for the IBMV model), but the standardized values were not statistically significant.

3) The stock of **Bancomer** had a positive price fluctuation of 8.2% on its saledate official announcement, that resulted in an abnormal return of 7.7% and 8.1%, for the Banamex-30 and the IBMV models, respectively. Significance levels for the tests were under 0.5%, in all cases. This is a clear example that indicates the need of further contrasting the aggregated results for the abnormal returns of portfolios on the saledate event. Bancomer's stock extraordinary jump on the official assignation date (October 28, 1991) disagrees with the general conclusion that privileged information trading had already incorporated all the price adjustment necessary on the bank's stock (EMH strong-form).

4) In the case of **Comermex**, a very highly significant negative abnormal return (less than 0.1% significance level) was observed for both, the equally weighted and the value weighted models, on the date of the official assignation. Once again, this result is opposed to the general conclusion reached for the aggregated portfolios analysis.

5) For **Banca Cremi** (CREMI), null hypotheses that stated that no significant cumulative abnormal returns existed for the two event windows indicated were rejected at a 2% significance level. Positive cumulative abnormal results were observed for both, the Banamex-30 and the IBMV models. Results suggest that the bank's stock revaluation process took place on a fast and steady manner. In particular, traders pushed the price up consistently on the last 16 days period. Cumulative abnormal returns were very high for both event windows:

BANORIE	**Banamex-30**	**IBMV**
CAR -15 to 0	48.3%	51.6%
CAR -30 to 0	31.6%	38.5%

6) **Banco Internacional**'s (INTENAL) stock price was negatively revised all along the 30 days period previous to the saledate announcement

INTENAL	**Banamex-30**	**IBMV**
CAR -15 to 0	-3.7%	-5.9%
CAR -30 to 0	-15.7%	-15.9%

Notwithstanding, statistical significance (at a 5% level) was present only on the saledate abnormal returns. Interpretation of this results leads to the proposition that although the market had assimilated the need to revise downwards

the stock's price, release of the information that accompanied the assignation announcement took that revision further still, in a single trading session. The result supports the existence of semi-strong efficiency, but disagrees with the general conclusion of strong market efficiency presence.

7) **Multibanco Mercantil de Mexico** (MERCANT) is a very similar case to Banco del Atlantico. All three hypotheses tested were rejected. There is a statistically meaningful positive evidence of informational effect on the stock's returns. Rejection of the hypotheses was possible at a low significance level (less than 4%), except for hypothesis 11, when the Banamex-30 based model to calculate abnormal returns is used. The general conclusions reached for the Atlantico analysis also hold in this case.

8) **Banca Serfin**'s (SERFIN) saledate event analysis is comparable to Internacional. The two banks' stocks prices were negatively revised during the 31 days event window, presenting important negative returns in all the event window sub-periods, and on the event day:

SERFIN	Banamex-30	IBMV
Event day	-3.6%	-3.7%
CAR -15 to 0	-27.1%	-25.2%
CAR -30 to 0	-31.2%	-25.3%

In this case the only statistically significant abnormal return presence evidence corresponds to the -15 to 0 sub-period. All other comments made in the Internacional analysis also hold in this case.

9) Apparently, for **Banca Somex,** the stocks negative price adjustment took place almost completely during the -30 to -1 event window. Abnormal returns during the saledate trading session were minimal for the two different market indexes based models.

Hypotheses to test the presence of significant negative cumulative returns are rejected at a 1.5% significance level, except when the -30 to 0 window is tested with the Banamex-30 index.

V.CONCLUSIONS

Several theoretical and interpretative comments can be extracted from the previous empirical results. In some cases, only a descriptive interpretation is practicable, with the intention to call the interest of the reader on the bizarre nature of stock returns in the presence of relevant information releases.

Some other times, a contextual, mostly tentative, interpretation of results is presented. I would like to emphasize that the tentative nature of many of the conclusions should not be considered speculative, or subjective. The response of bank stocks to official information releases was statistically analyzed and, from that perspective, found to be abnormal in repeated cases. In that sense, statistical significance of residuals (or "abnormality" in the behavior of returns), represents important wealth creation-destruction situations. My interest is focused in offering a reasonably logical explanation of the circumstances that may have been in action to produce such outcomes.

I insist in the argument that the tentative nature of these contextual interpretations is mostly due to the inexistence of detailed information on who were the ultimate decission makers that influenced bank stock prices one way or another during the privatization events. More precisely, unavailability of insiders' trading records leaves open the possibility that the wealth creation-destruction described took place as the result of privileged information trading, although that may well not have been the case. No conclusive evidence can be presented to support that argument, besides some reasonably logical inferences; but contradictory evidence is not available either.

Regression to estimate the Market Model parameters were found to be very satisfactory in most cases. The significance of the regression coefficients and the coefficients of determination are good when compared to other emprical studies of approximately the same nature and similar context.

As was to be expected, given the composition of the Banamex-30 index in which the proportion of bank stocks is high, regressions performed with that index consistently present higher coefficients of determination than when the same observations are regressed with the IBMV. This results seem to confirm the presence of an econometric problem where the explanatory variable and disturbance term are contemporaneously correlated. Notwithstanding, hypotheses tests results seem robust when the Market Model used to calculate abnormal results is estimated with both, the Banamex-30 and IBMV.

The only exceptions to adequacy of regression fit results correspond to individual regressions for stocks with the most serious thin trading problem in the sample. This was no surprise at all, since low coefficients of determination and a very high probability of a Type I error should be expected in precisely those stocks whose recorded returns represent discrete jump processes, when regressed against a market returns index, which is assumed to be of a continuos nature.

The Scholes and Williams adjustment technique yielded notable differences for the systematic risk coefficients of individual stocks regressions estimated for the sale date event infrmation impact analysis, particularly so in the case of those stocks suffering a thin trading problem, which is a perfectly consistent result. In other cases, although frequently the adjusted betas are substantially different (sometimes they even change algebraic signs), the magnitude of such differences is much smaller.

With respect to the tests of normality in the distribution of residuals, in general, the null hypothesis that abnormal returns belong to a normal parent distribution is rejected, except for a few cases. Consistent with other authors conclusions, estimated abnormal returns for banks stocks during the privatization period follow a right side skewed and more than normally peaked distribution. Also, a higher than normal proportion of the observations falls into the tails of the sample distribution, or what is called a "fat tails" distribution.

Although non-normality of abnormal returns is evident from the results reported above, hypothesis tests to establish the significance of abnormal returns during event dates are expected to support consistent conclusions. Based on other authors findings, the correctness of calculated test statistics is not suspect of methodological inadequacy as a consequence of the presence of a non-normal distribution of abnormal returns (as it was discussed in Chapters 3 and 4) . Nevertheless, the reader should be aware of the statistical characteristics of the database, before attempting a generalization of the results obtained.

In general terms, the hypothses tested gave results consistent with the proposition that the official announcements of privatization related actions had a significant impact on bank stock prices. Results also frequently support the suspicion that confidential information was traded on before the official announcements took place.

Some specific comments are in place:

For the May 2, 1990 event the response of bank stocks to the privatization announcement leaves no doubt with respect to the efficiency of the market to incorporate a relevant piece of information into their market prices. Practically all the hypotheses tested for this event yield the same affirmative response to the presence of highly positive abnormal returns. The wealth impact of the privatization announcement was clearly good news for the market. The magnitude of price increases for bank stocks on that day was many times larger than the average return during the previous months in all cases, so individual absolute differences are not relevant. The lesson to be extracted from this experience is that the Mexican stock market response to an unexpected official announcement relevant to stock's market quotations is particularly intense. An effort to prevent the occurrence of such volatile responses corresponds to the authorities responsible for the market stability surveyance.

Abnormal returns on the next day of the privatization announcement should not had been significantly different from zero in the absence of another piece of relevant information that justified their presence. An almost unanimous rejection of the null hypothesis of no abnormal returns is considered as evidence that investors behavior was inertial, certainly influenced by the previous day's stocks prices impressive response to the privatization announcement. It can also be argued that this fact confirms that information diffusion and investors' response is slower in the Mexican stock exchange than what would be expected in more mature markets.

But that is not the only possible explanation. The next day's abnormal returns statistical significance may either reflect a delay in response due to a late information awareness, or a very intense re-evaluation of bank stocks worth. This last possibility gives support to the hypothesis that, if markets are efficient, the banks privatization announcement was deeply transcendental for investors expectations regarding bank's future earnings potential.

When the -30 to -16 period with respect to May 2, 1990 is statistically analyzes results fully validate the graphical evidence and give support to the argument that possibly some participants in the market traded on confidential information a month earlier than the public official announcement of the decision to privatize the banking system.

During the -15 to 0 event window, with respect to the same event date, although the statistical tests did not consider the magnitude of abnormal returns significant in five out of six cases, what should not pass unappraised is the interesting fact that the cumulative abnormal returns were negative in all cases. It seems that, after the accumulation period observed from the -30 through the -16 trading days, market participants who did not have access to privileged information were not convinced that the historically high quotations observed for the bank's stocks were justified. Given the fundamental, publicly available information, they decided to act on the supply side, and pushed the banks stock prices down again.

In an attempt to find a more objective explanation of the evidence, the argument that rumors about the possibility of privatization were intensified by the media during the positive cumulative abnormal returns period and diminished during the last two weeks, was empirically contrasted. A careful revision of the newspaper articles related to the possibility of a change of policy with respect to the ownership of the banks by the state demonstrated that such a commentary was present, in some cases, more than six months earlier. In fact, the banking system privatization theme was present in the most serious and important Mexican newspapers and in the publicly expressed opinions of several leaders of the Mexican business sector, with a constant frequency, at least since the beginning of 1990.

A conclusion that can be derived from the cumulative abnormal returns analysis with respect to May 2, 1990 is that for some reason the banks prices behaved abnormally during the 30 days event window previous to the banking system privatization announcement. Predominantly, this evidence seems to be related to the filtering of privileged information, although several other explanations are, obviously, feasible.

Although the auction announcement of a "package" of banks implicitly represented an information release about the closeness of the moment when the banks included would soon return to private-hands management, thus giving support to the argument that better operational returns were closer than for the rest of the banks, this information piece seemed to be disregarded, except in the cases of the first and the fourth auction announcements.

With respect to the first group of banks, it can be argued that the response of the market was speculative because of the novelty of the situation, and, in a way, impulsive. When the following groups were announced this effect was not present anymore.

It seems that once the first group of banks had undergone the whole process and the secret auction process had assigned each bank to their new owners, market participants had the time to assimilate the novelty of the process. It was evident that the auction process did not generate any additional wealth to the stock owners and, thus, should not have a significant impact on the supply-demand mechanism of the market. there was no benefit on trading with an extraordinary intensity.

With respect to the fourth group of banks, whose abnormal returns were significantly different from zero, no easy explanation can be offered. Why that group and not the others? It is a difficult question. Some parallelism was searched for with the first group, but the characteristics were totally different. In fact, the Portfolio 7 group had more in common with the rest of the non-significant abnormal returns portfolios than with Portfolio 4. No evident relationship exists among these two groups of banks.

In a sense, the rejection of the null hypothesis for the two auction announcement cases supports the existence of a semi-strong form of efficiency, since what can be considered an important piece of information was publicly released. But the rest of the evidence seems to support the opposite conclusion, that the market was indifferent to that information, since most of the time the null hypotheses of no abnormal returns were not rejected. In other words, the market did not seem to agree with the proposition that the auction announcement was an important piece of information.

The fact that Portfolio 4 registered an extraordinary increase in its stocks prices during the five days previous to the official announcement of the auction could be possibly interpreted as evidence of a privileged information leakage. But the contrasting results for the rest of the portfolios (except Portfolio 7) challenge the generalized validity of that argument. Was that circumstance what made Portfolio 4 and Portfolio 7 behave in such a similar way? It is hard to make such an assertion, but not many alternative explanations are available.

Several insights are in order for the sale date announcement event date hypotheses tests. In particular the fact that the hypotheses tested to evaluate the presence of abnormal returns on the sale date announcement, and on the cumulative period from day -30 to day 0, were not statistically significant. The absence of significant abnormal returns for two out of three hypotheses tested is supportive of the presence of strong form efficiency in the Mexican market, in relation to the saledate event.

A more detailed analysis of the results shows that the presence of statistically significance for abnormal returns was detected on portfolios 10 and 11, which correspond to the four largest and the 11 smaller banks, respectively. In both portfolios the statistically significant evidence to reject the null hypothesis was present whether the estimation of the Market Model parameters was based on the Banamex-30 index, or on the IBMV.

The value of the statistics that rejected the hypothesis were opposite in sign for each portfolio's abnormal returns. That is, the portfolio integrated with the four largest banks had a positive statistically significant abnormal return, while the one containing the smaller eleven banks presented a negative statistically significant abnormal return. A straightforward interpretation of this result is that the market participants found information pieces that supported a revaluation of the largest banks stocks, while in the case of the smaller, the case was the opposite.

It is important to mention that the result of the hypothesis test that was performed on the abnormal returns calculated for the whole sample of banks stocks portfolio (number 12), was not statistically significant. The combined effect of positive and negative abnormal returns resulted in an irrelevant net effect, in what can be adequately defined as a "portfolio diversification effect".

The lack of calendar time correspondence among the different saledate events of the stocks included in each portfolio required the estimation of the

individual SW adjusted Market Model parameters. Although the methodological position adopted for the rest of the empirical results analysis in this work is based on the integration of portfolios with several banks stocks, the individual banks' Market Model abnormal returns provided evidence that the diversification effect of portfolio integration is, in fact, very powerful. Besides, a case by case evaluation of the abnormal returns effect of the saledate event still has enough statistical validity. What is more, since the saledate events were different calendar dates for each bank, no "effective" netting result could have taken place.

The presence of statistically significant abnormal returns for the individual bank stocks, is relevant from the EMH perspective, if due recognition is given to the fact that perhaps an important component of the observed returns corresponds to unsystematic risk, but more relevant still, from a wealth creation-destruction perspective of analysis. In effect, this proved to be the case for a number of banks stocks whose abnormal returns were large enough to reject the null hypothesis of no statistically significant deviations from zero. A case by case analysis was already presented in Chapter 4, confirming the perception that the diversification effect of portfolios integration diminished the power of the tests to identify significant wealth creation-destruction effects for the individual bank stocks resulting from the sale date annoucements. The conclusion that can be reached is that the individual tests' results throw light on the possible misuse of the aggregation of different stocks into portfolios technique, when the event dates are different for each stock included. The conditions that prevailed on the different event dates were comparable, in general terms. The impact that the official assignation announcement was expected to have on the different cases was, in fact, notably distinct. The conclusions of the individual cases analysis could have been omitted if the aggregation technique results had been considered enough.

Another important consequence of the individual cases analysis is that the contrasting results obtained present an interesting opportunity of further research development to try to establish some explanatory causal relationships. The future avenues of research that I find to naturally derive from the analyzed

empirical evidence presented here are related to interesting aspects of valuation theory. In particular, research projects can be developed to establish the wealth creation-destruction effects of other privatization experiences in Mexico (and elsewhere). Another interesting project that can derive directly from the present work's results is the search for relations among the magnitude of abnormal returns observed for individual banks on the sale date announcement event and the banks' fundamental variables (financial and strategic).

But perhaps the most relevant conclusion that can be derived from the results is that the mere possibility that insider trading can explain any recorded inefficiencies on the behavior of the banks´ stock prices during their privatization period, should call the attention of regulators on the necessity of more effective controls to enforce the 1989 Law of the Securities Market, that bans privileged information trading.

Although the need for more empirical results that validates the evidence presented here is objectively recognized, a concrete need to detect the presence of privileged information illegal use is the implementation of a mechanism to record insiders trading to detect anomalies. This is the most effective way to prevent the use of non-publicly available information by those who have access to it.

Regulators in more developed markets have realized the importance of implementing adequate mechanisms to acomplish the insider's trading data recording. In Mexico´s case, the experience of the banks privatization process analyzed here, and the significant wealth creation and destruction that resulted from official announcements, during the period before and on the event date itself, represents serious evidence of the posible missuse of privileged information. Although no concrete proof of insiders' activity exists, precisely as a consequence of the lack of insiders' trading records, statistical evidence repeatedly supports that possibility.

The modernization and professionalism of the Mexican stock exchange could be greatly improved with the establishment of an adequate reglamentation and proceedings for insiders' trading control. This mechanism represents a guarantee of transparency, not only for the government-owned publicly traded firms that may eventually undergo a privatization process. But with a wider perspective of application to the purpose of monitoring a whole universe of transactions that are regulated by a Law that, until the present, cannot be adequately enforced The objective of implementing and insiders' trading recording mechanism seems to me an important step in the right direction.

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TABLES AND CHARTS

TABLE 1.1A

NUMBER OF PRIVATIZATION CASES WORLDWIDE, BY INDUSTRY,

1980-1987

ECONOMIC SECTOR	NUMBER OF CASES	PERCENTAGE
BANKS	29	24.58
AIRLINES	29	24.58
TELECOMUNICATION	22	18.64
ELECTRICITY	12	10.17
OTHER FIN.SERVICES.	9	7.63
STEEL	7	5.93
PUBLIC SERVICES	5	4.24
MINING	5	4.24
TOTAL	118	100.00

Source: Techniques of Privatization of State Owned Enterprises, Volume 3, The World Bank, 1988.

TABLE 3.1A

IMPORTANT DATES IN THE MEXICAN BANKS' PRIVATIZATION PROCESS

	FIRST PUBLIC OFFERING	AUCTION ANNOUNCEMENT	SALE DATE**
MERCANTIL	March/14/1990	Feb/19/1991	June/10/1991
BANPAIS	N.A.*	Feb/19/1991	June/17/1991
CREMI	April/22/1987	Feb/19/1991	June/24/1991
CONFIA	April/20/1987	May/3/1991	Aug/8/1991
BANORIENTE	May/11/1987	May/3/1991	Aug/15/1991
BANCRESER	N.A.*	May/3/1991	Aug/19/1991
BANAMEX	Feb/9/1987	May/3/1991	Aug/26/1991
BANCOMER	Feb/9/1987	July/26/1991	Oct/28/1991
B.C.H.	N.A.*	July/26/1991	Nov/11/1991
SERFIN	March/23/1987	Oct/31/1991	Jan/27/1992
COMERMEX	May/18/1987	Oct/31/1991	Feb/10/1992
SOMEX	Feb/10/1990	Oct/31/1991	March/2/1992
ATLANTICO	May/20/1987	Jan/17/1992	March/30/1992
PROMEX	May/18/1987	Jan/17/1992	April/6/1992
BANORO	June/3/1987	Jan/17/1992	April/12/1992
BANORTE	May/15/87	March/27/1992	June/15/1992
INTERNACIONAL	April/22/1987	March/27/1992	June/29/1992
BANCEN	April/14/1987	March/27/1992	July/4/1992

*** NOT APLICABLE SINCE THESE STOCKS WERE NOT PUBLICLY PLACED AT THE B.M.V.**

**** FOR BANKS WHOSE STOCK WAS PUBLICLY TRADED AT THE MOMENT OF THE PRIVATIZATION, IF THE ANNOUNCEMENT DAY WAS NOT A TRADING DAY, THE NEXT TRADING DAY IS CONSIDERED AS THE EVENT DAY.**

TABLE 3.2A

MARKET PRICE/BOOK VALUE AND WINNING BID/BOOK VALUE RELATIONSHIPS ON THE SALEDATE OF INDIVIDUAL BANKS

BANK NAME	MKT.PRICE/ BOOKVALUE	WINNING BID/ BOOKVALUE	% OF BANK ACQUIRED
ATLANTICO	3.00	5.30	68.64%
BANCOMER	2.21	2.99	62.60%
BANAMEX	2.19	2.62	70.72%
BANCEN	2.12	4.62	66.31%
BANORIE	2.26	4.00	69.31%
BANORO	2.20	3.95	66.00%
BANORTE	3.14	4.25	66.00%
COMERMEX	2.43	3.73	66.54%
CONFIA	2.34	3.73	78.68%
CREMI	2.45	3.40	66.74%

(continuation of Table 3.2A)

INTENAL	1.94	2.95	51.00%
MERCANTIL	2.02	2.66	77.19%
PROMEX	2.36	4.23	66.00%
SERFIN	1.71	2.69	51.00%
SOMEX	1.98	4.15	81.62%
AVERAGE	2.28	3.68	67.22%

SOURCE: ANUARIO FINANCIERO DE LA BOLSA MEXICANA DE VALORES, 1991 AND 1992; SECRETARIA DE HACIENDA Y CREDITO PUBLICO, MEXICO, 1993.

TABLE 4.1A

REGRESSION´S PARAMETERS FOR PORTFOLIOS WITH 50 OBSERVATIONS FROM -30 TO -6 AND FROM +6 TO +30 WITH RESPECT TO MAY 2, 1990.

	R^2	ADJ. R^2	F	SIG. F	CONSTANT	SIGNIF. CONSTANT	BETA
PORT1 W/							
BNMX-30	0.53355	0.52383	54.90532	0.00000	0.00209	0.40780	1.60679
IBMV	0.25562	0.24011	16.48285	0.00020	0.00385	0.23100	1.23089
PORT2 W/							
BNMX-30	0.40819	0.39587	33.10772	0.00000	0.00524	0.00570	0.90181
IBMV	0.16225	0.14480	9.29632	0.00370	0.00645	0.00450	0.62925
PORT3 W/							
BNMX-30	0.53687	0.52722	55.64209	0.00000	0.00440	0.01220	1.08980
IBMV	0.23013	0.21409	14.34836	0.00040	0.00576	0.01130	0.78969

TABLE 4.2A

REGRESSIONS' PARAMETERS FOR PORTFOLIOS WITH 120 OBSERVATIONS, FROM -150 TO -30 WITH RESPECT TO MAY 2, 1990.

	R^2	ADJ. R^2	F	SIG. F	CONSTANT	SIGNIF. CONSTANT	BETA
PORT1 W/							
BNMX-30	0.71170	0.70926	291.29751	0.00000	0.00270	0.01660	1.30361
IBMV	0.56493	0.56124	153.21829	0.00000	0.00397	0.00410	1.31659
PORT2 W/							
BNMX-30	0.55329	0.54950	146.15190	0.00000	0.00542	0.00000	0.92232
IBMV	0.35782	0.35239	65.75021	0.00000	0.00642	0.00000	0.84081
PORT3 W/							
BNMX-30	0.70304	0.70053	279.36562	0.00000	0.00458	0.00000	1.03964
IBMV	0.49331	0.48901	114.88265	0.00000	0.00567	0.00000	0.98720

TABLE 4.3A

REGRESSIONS' PARAMETERS FOR PORTFOLIOS WITH 120 OBSERVATIONS, FROM -150 TO -30, WITH RESPECT TO THE SALE ANNOUNCEMENT DATE.

	R^2	ADJ. R^2	F	SIG. F	CONSTANT	SIGNIF. CONSTANT	BETA
PORT 4 W/							
BNMX-30	0.25761	0.25131	40.94523	0.00000	0.00033	0.76060	0.45546
IBMV	0.22316	0.21653	33.89755	0.00000	0.00049	0.66100	0.43189
PORT 5 W/							
BNMX-30	0.25595	0.25323	41.35251	0.00000	0.00076	0.26220	0.32434
IBMV	0.20614	0.19942	30.64149	0.00000	0.00079	0.26210	0.28369
PORT 6 W/							
BNMX-30	0.39699	0.39188	77.68630	0.00000	0.00118	0.51040	1.10762
IBMV	0.17940	0.17245	25.79762	0.00000	0.00332	0.11090	0.60567
PORT 7 W/							
BNMX-30	0.21266	0.20598	31.87107	0.00000	0.00010	0.94170	0.55945
IBMV	0.02749	0.01918	3.30751	0.07150	0.00070	0.66970	0.17530
PORT 8 W/							
BNMX-30	0.21832	0.21170	32.95710	0.00000	0.00148	0.31380	0.64308
IBMV	0.02766	0.01935	3.32831	0.07060	0.00140	0.40200	0.24271
PORT 9 W/							
BNMX-30	0.44076	0.43602	93.00097	0.00000	0.00064	0.64640	1.16347
IBMV	0.24113	0.23470	37.49408	0.00000	-0.00070	0.67590	0.83575

TABLE 4.4A

REGRESSIONS´ PARAMETERS FOR INDIVIDUAL STOCKS WITH 120 OBSERVATIONS
FOR 120 OBSERVATIONS
FROM -150 TO -30 WITH RESPECT TO THE SALE DATE

		R^2	ADJ. R^2	F	SIG. F	CONSTANT	BETA
ATLANT W/	BNMX-30	0.14090	0.13362	19.35341	0.00000	0.00182	0.58513
	IBMV	0.05677	0.04878	7.10237	0.00880	0.00203	0.36282
BANCEN W/	BNMX-30	0.12040	0.11345	16.22858	0.00010	0.00045	0.75727
	IBMV	0.08478	0.07702	10.93032	0.00130	0.00055	0.57095
BANORIE W/	BNMX-30	0.01597	0.00763	1.91547	0.16900	0.00133	0.14335
	IBMV	0.00001	0.00847	0.00070	0.97890	0.00196	-0.00230
BANORO W/	BNMX-30	0.27771	0.27159	45.36872	0.00000	0.00039	1.14496
	IBMV	0.10865	0.10109	14.38311	0.00020	0.00136	0.67885
BANORTE W/	BNMX-30	0.36972	0.36438	69.21886	0.00000	0.00110	1.29081
	IBMV	0.23148	0.22496	35.54120	0.00000	0.00179	0.93778
BANCOMER W/	BNMX-30	0.36305	0.35765	67.25655	0.00000	0.00198	1.21204
	IBMV	0.12343	0.11594	16.47470	0.00010	0.00244	0.62100
BANAMEX W/	BNMX-30	0.24792	0.24155	38.89875	0.00000	0.00009	0.91419
	IBMV	0.05423	0.04615	6.70935	0.01080	0.00283	0.33522
COMERMEX W/	BNMX-30	0.27853	0.27242	45.55508	0.00000	0.00165	1.04544
	IBMV	0.13846	0.13116	18.96425	0.00000	0.00082	0.75811
CONFIA W/	BNMX-30	0.01177	0.00339	1.40487	0.23830	0.00508	0.20065
	IBMV	0.00427	-0.00417	0.50613	0.47820	0.00554	0.10014
CREMI W/	BNMX-30	0.01549	0.01549	1.85691	0.17560	0.00247	0.14920
	IBMV	0.00750	-0.00091	0.89163	0.34700	0.00259	0.08075
INTERNACI W/	BNMX-30	0.30637	0.30050	52.12061	0.00000	-0.00015	1.28030
	IBMV	0.20272	0.19596	30.00264	0.00000	-0.00121	0.94130
MERCANTIL W/	BNMX-30	0.02217	0.01388	2.67488	0.10460	0.00238	0.21490
	IBMV	0.00353	-0.00492	0.41777	0.51930	0.00275	0.06803
PROMEX W/	BNMX-30	0.00224	-0.00622	0.26444	0.60810	0.00343	0.07687
	IBMV	0.00012	-0.00836	0.01373	0.90690	0.00368	-0.01677
SERFIN W/	BNMX-30	0.42027	0.41536	85.54459	0.00000	0.00023	1.45664
	IBMV	0.17320	0.16613	24.50943	0.00000	0.00079	0.97480
SOMEX W/	BNMX-30	0.05198	0.04395	6.47059	0.01230	0.00679	-0.51724
	IBMV	0.07606	0.06823	9.71402	0.00230	0.00772	0.65634

TABLE 4.5A

SYSTEMATIC RISK PARAMETERS (BETAS).

EVENT DATE: SALE DATE ANNOUNCEMENT.

ESTIMATION PERIOD: FROM -150 TO -30.

Individual bank Market Models	OLS Beta	SW Beta	Difference
Atlantico w/Banamex-30	0.58510	1.01774	73.94%
Atlantico w/IBMV	0.36280	0.69882	92.62%
Bancen w/Banamex-30	0.75730	0.94645	24.98%
Bancen w/IBMV	0.57100	0.76714	34.35%
Banorte w/Banamex-30	0.14340	0.27413	91.17%
Banorte w/IBMV	-0.00230	-0.03831	1565.65%
Banoro w/Banamex-30	1.14500	1.23346	7.73%
Banoro w/IBMV	0.67890	0.77706	14.46%
Banorte w/Banamex-30	1.29080	1.49717	15.99%
Banorte w/IBMV	0.93780	1.11243	18.62%
Bancomer w/Banamex-30	1.21200	1.04385	-13.87%
Bancomer w/IBMV	0.62100	0.38047	-38.73%
Banamex w/Banamex-30	0.91420	0.37307	-59.19%
Banamex w/IBMV	0.33520	0.02055	-93.87%
Comermex w/Banamex-30	1.04540	0.83710	-19.93%
Comermex w/IBMV	0.75810	0.80989	6.83%
Confia w/Banamex-30	0.20070	0.39672	97.67%
Confia w/IBMV	0.10010	0.10558	5.47%
Creml w/Banamex-30	0.14920	0.41201	176.15%
Creml w/IBMV	0.08080	0.32419	301.22%
Intenal w/Banamex-30	1.28030	1.41201	10.29%
Intenal w/IBMV	0.94130	0.93940	-0.20%
Mercantil w/Banamex-30	0.21490	0.64442	199.87%
Mercantil w/IBMV	0.06800	0.38768	470.12%
Promex w/Banamex-30	0.07690	0.32628	324.30%
Promex w/IBMV	-0.01468	0.08614	-686.81%
Serfin w/Banamex-30	1.45660	1.76207	20.97%
Serfin w/IBMV	0.97480	1.31931	35.34%
Somex w/Banamex-30	-0.51720	-0.84596	63.57%
Somex w/IBMV	-0.65630	-0.08910	-86.42%
AVERAGE	0.52370	0.63106	20.50%

TABLE 4.6A

RESIDUALS' PARAMETERS FOR REGRESSIONS WITH 50 OBSERVATIONS, FROM -30 TO -6 AND +6 TO +30, WITH RESPECT TO MAY 2, 1990.

	MEAN	STD. DEV.	KURTOSIS*	SKEWNESS**	RANGE	STUDENTIZED RANGE**
PORT 1 W/						
BNMX-30	0	0.01700	3.40300	1.36900	0.08600	5.05882
IBMV	0	0.02100	2.31000	1.21200	0.10100	4.80952
PORT 2 W/						
BNMX-30	0	0.01200	2.76700	1.47500	0.06100	5.08333
IBMV	0	0.01400	2.10100	1.43200	0.06900	4.92857
PORT 3 W/						
BNMX-30	0	0.01100	0.78500	1.11900	0.04900	4.45455
IBMV	0	0.01400	0.96100	1.18000	0.06300	4.50000

* THE STANDARD ERROR FOR THE KURTOSIS IS .662

** THE STANDARD ERROR FOR THE SKEWNESS IS .337

***THE .95 FRACTILE OF THE DISTRIBUTION OF THE STUDENTIZED RANGE FOR SAMPLES OF 50 OBSERVATIONS IS GIVEN BY THE VALUE 5.35

TABLE 4.7A

RESIDUALS' PARAMETERS FOR REGRESSIONS WITH 120 OBSERVATIONS FROM -150 TO -120, WITH RESPECT TO MAY 2, 1990.

	MEAN	STD. DEV.	KURTOSIS*	SKEWNESS**	RANGE	STUDENTIZED RANGE***
PORT 1 W/						
BNMX-30	0.00000	0.01200	2.24200	0.03800	0.08300	6.91667
IBMV	0.00000	0.01500	2.90100	0.44100	0.11100	7.40000
PORT 2 W/						
BNMX-30	0.00000	0.01200	2.71000	0.08800	0.08300	6.91667
IBMV	0.00000	0.01400	2.47500	-0.00500	0.09600	6.85714
PORT 3 W/						
BNMX-30	0.00000	0.01000	2.44600	0.38000	0.06500	6.50000
IBMV	0.00000	0.01300	2.67900	0.31600	0.08700	6.69231

* THE STANDARD ERROR FOR THE KURTOSIS IS .438

** THE STANDARD ERROR FOR THE SKEWNESS IS .221

***THE .95 FRACTILE OF THE DISTRIBUTION OF THE STUDENTIZED RANGE FOR SAMPLES OF 120 OBSERVATIONS IS GIVEN BY THE VALUE 6.01

TABLE 4.8A

RESIDUALS' PARAMETERS FOR REGRESSIONS WITH 120 OBSERVATIONS FROM -150 TO -120, WITH RESPECT TO THE SALE ANNOUNCEMENT DATE.

	MEAN	STD. DEV.	KURTOSIS*	SKEWNESS**	RANGE	STUDENTIZED RANGE***
PORT 4 W/						
BNMX-30	0.00000	0.01200	8.55200	-1.43000	0.10500	8.75000
IBMV	0.00000	0.01200	12.13000	-1.77500	0.11500	9.58333
PORT 5 W/						
BNMX-30	0.00000	0.00700	5.40700	1.60500	0.05200	7.42857
IBMV	0.00000	0.00800	4.68700	1.56100	0.05000	6.25000
PORT 6 W/						
BNMX-30	0.00000	0.01900	3.50400	0.47000	0.14700	7.73684
IBMV	0.00000	0.02200	2.04300	0.59100	0.15100	6.86364
PORT 7 W/						
BNMX-30	0.00000	0.01500	0.96700	0.20700	0.09600	6.40000
IBMV	0.00000	0.01700	0.54700	0.19000	0.09700	5.70588
PORT 8 W/						
BNMX-30	0.00000	0.01600	3.53600	0.30600	0.11800	7.37500
IBMV	0.00000	0.01800	3.09400	0.36400	0.12300	6.83333
PORT 9 W/						
BNMX-30	0.00000	0.01500	0.40700	-0.30100	0.08700	5.80000
IBMV	0.00000	0.01700	0.65400	-0.36100	0.10400	6.11765

* THE STANDARD ERROR FOR THE KURTOSIS IS .438

** THE STANDARD ERROR FOR THE SKEWNESS IS .221

***THE .95 FRACTILE OF THE DISTRIBUTION OF THE STUDENTIZED RANGE FOR SAMPLES OF 120 OBSERVATIONS IS GIVEN BY THE VALUE 6.01

TABLE 4.9A

RESIDUAL ANALYSIS FOR INDIVIDUAL STOCK REGRESSIONS
WITH 120 OBSERVATIONS, FROM -150 TO -20,
WITH RESPECT TO THE SALE DATE.

		MEAN	STD.DEV.	KURTOSIS *	SKEWNESS **	RANGE	STUDENTIZED RANGE***
'LANTICO	BNMX-30	0	0.016	4.277	1.210	0.112	7.00
	IBMV	0	0.017	5.399	1.118	0.134	7.88
\NCEN	BNMX-30	0	0.024	1.127	0.109	0.142	5.92
	IBMV	0	0.025	0.901	0.115	0.142	5.68
\NORIE	BNMX-30	0	0.016	12.824	2.054	0.151	9.44
	IBMV	0	0.016	13.587	2.217	0.152	9.50
\NORO	BNMX-30	0	0.019	-0.078	0.082	0.095	5.00
	IBMV	0	0.022	0.137	0.190	0.116	5.27
\NORTE	BNMX-30	0	0.021	0.632	0.071	0.130	6.19
	IBMV	0	0.023	0.920	0.115	0.147	6.39
NCOMER	BNMX-30	0	0.023	1.789	0.347	0.147	6.39
	IBMV	0	0.027	0.780	0.198	0.155	5.74
NAMEX	BNMX-30	0	0.019	2.795	0.489	0.140	7.37
	IBMV	0	0.022	2.723	0.688	0.147	6.68
IMERMEX	BNMX-30	0	0.022	1.291	0.653	0.129	5.86
	IBMV	0	0.024	1.818	0.643	0.154	6.42
INFIA	BNMX-30	0	0.026	57.464	6.849	0.253	9.73
	IBMV	0	0.026	58.501	6.940	0.250	9.62
IEMI	BNMX-30	0	0.015	14.882	3.392	0.124	8.27
	IBMV	0	0.015	15.144	3.456	0.125	8.33
TERNAL	BNMX-30	0	0.024	2.033	-0.354	0.170	7.08
	IBMV	0	0.026	1.903	-0.384	0.169	6.50
RCANTIL	BNMX-30	0	0.018	7.682	1.075	0.154	8.56
	IBMV	0	0.019	7.703	1.139	0.152	8.00
OMEX	BNMX-30	0	0.017	2.984	0.243	0.107	6.29
	IBMV	0	0.017	2.806	0.330	0.106	6.24
RFIN	BNMX-30	0	0.021	1.220	0.351	0.127	6.05
	IBMV	0	0.026	2.082	0.344	0.167	6.42
IMEX	BNMX-30	0	0.030	2.792	0.929	0.191	6.37
	IBMV	0	0.029	2.664	0.891	0.188	6.48

HE STANDARD ERROR FOR THE KURTOSIS IS .438

THE STANDARD ERROR FOR THE SKEWNESS IS .221

THE .95 FRACTILE OF THE DISTRIBUTION OF THE STUDENTIZED RANGE FOR SAMPLES OF 120
SERVATIONS IS GIVEN BY THE VALUE 6.01

TABLE 4.10A

MEXICAN BANKING SYSTEM PRIVATIZATION OFFICIAL ANNOUNCEMENT (MAY 2, 1990)

TEST OF HYPOTHESIS FOR THE SIGNIFICANCE OF ABNORMAL RETURNS

MARKET MODEL WITH 50 OBSERVATIONS.

	MODEL 1	MODEL 2	MODEL 3	MODEL 4	MODEL 5	MODEL 6
	PORTF.1 /BNMX-30	PORTF.1 /IBMV	PORTF.2 /BNMX-30	PORTF.2 /IBMV	PORTF.3 /BNMX-30	PORTF.3 /IBMV
ABNORMAL RETURN / MAY 2, 1990.	0.04407	0.08746	0.03903	0.06592	0.04038	0.07166
ABNORMAL RETURN / MAY 3, 1990.	0.01954	0.05509	0.03886	0.06030	0.03371	0.05891
STD.ERR. WITHOUT ADJUSTMENT	0.01671	0.02111	0.01208	0.01437	0.01126	0.01451
STD.ERR./FCST., MAY 2,1990	0.02974	0.03401	0.02149	0.02315	0.02003	0.02338
STD.ERR./FCST., MAY 3,1990	0.02583	0.02882	0.01867	0.01961	0.01740	0.01981

SINGLE DAY EVENT WINDOW TEST STATISTICS

A) WITH UNADJUSTED STANDARD ERROR

MAY 2, 1990.	2.63772	4.14350	3.23200	4.58767	3.58666	4.93737
SIGNIFICANCE LEVEL:	0.00860	<.0004	0.00120	<.0004	<.0004	<.0004
MAY 3, 1990.	1.16918	2.61008	3.21786	4.19652	2.99425	4.05872
SIGNIFICANCE LEVEL:	0.24600	0.00900	0.00140	<.0004	0.00280	<.0004

B) WITH "FORECAST" ADJUSTED STANDARD ERROR .

MAY 2, 1990.	1.48218	2.57172	1.81612	2.84741	2.01541	3.06445
SIGNIFICANCE LEVEL:	0.13880	0.01020	0.06880	0.00440	0.04440	0.00220
MAY 3, 1990.	0.75621	1.91192	2.08128	3.07402	1.93685	2.97308
SIGNIFICANCE LEVEL:	0.44720	0.05620	0.03760	0.00220	0.05240	0.00280

FIVE DAYS EVENT WINDOW TEST STATISTICS ASSUMING INTERTEMPORAL CORRELATION

CAR FROM - 5 TO 0:	0 03770	0.10672	0.01141	0.05272	0.01842	0.06712
STD.ERR./ FCST.CUM.:	0.12172	0.10414	0.08797	0.07089	0.08200	0.07161
STANDARDIZED CAR:	0.30972	1.02481	0.12968	0.74372	0.22462	0.93734
SIGNIFICANCE LEVEL:	0.75660	0.30780	0.90440	0.45920	0.82580	0.35240

TABLE 4.11A

MEXICAN BANKING SYSTEM PRIVATIZATION OFFICIAL ANNOUNCEMENT (MAY 2, 1990)

TEST OF HYPOTHESIS FOR THE SIGNIFICANCE OF ABNORMAL RETURNS

USING THE SCHOLES AND WILLIAMS' ADJUSTED MARKET MODEL WITH 50 OBSERVATIONS.

	MODEL 1	MODEL 2	MODEL 3	MODEL 4	MODEL 5	MODEL 6
	PORTF.1 /BNMX-30	PORTF.1 /IBMV	PORTF.2 /BNMX-30	PORTF.2 /IBMV	PORTF.3 /BNMX-30	PORTF.3 /IBMV
ABNORMAL RETURN / MAY 2, 1990.	0.03498	0.10643	0.00567	0.08563	0.04161	0.09117
ABNORMAL RETURN / MAY 3, 1990.	0.01338	0.06647	0.01576	0.07191	0.03462	0.07458
STD.ERR. WITHOUT ADJUSTMENT	0.01681	0.02159	0.01364	0.01514	0.01126	0.01525
STD.ERR./FCST., MAY 2,1990	0.02125	0.02526	0.01724	0.01771	0.01423	0.01785
STD.ERR./FCST., MAY 3,1990	0.01915	0.02304	0.01553	0.01615	0.01282	0.01626

SINGLE DAY EVENT WINDOW TEST STSTISTICS

A) WITH UNADJUSTED STANDARD ERROR

MAY 2, 1990.	2.08040	4.93067	0.04158	5.65748	3.69467	5.97779
SIGNIFICANCE LEVEL:	0.03760	<.0004	0.96800	<.0004	<.0004	<.0004
MAY 3, 1990.	0.79557	3.07954	1.15537	4.75112	3.07458	4.61962
SIGNIFICANCE LEVEL:	0.42960	0.00200	0.25020	<.0004	0.00220	<.0004

B) WITH "FORECAST" ADJUSTED STANDARD ERROR .

MAY 2, 1990.	1.64621	4.21331	0.32899	4.83438	2.92357	5.10809
SIGNIFICANCE LEVEL:	0.10100	<.0004	0.74140	<.0004	0.00360	<.0004
MAY 3, 1990.	0.69862	2.88534	1.04572	4.45151	2.69991	4.32830
SIGNIFICANCE LEVEL:	0.48400	0.00380	0.29380	<.0004	0.03840	<.0004

FIVE DAYS EVENT WINDOW TEST STATISTICS ASSUMING INTERTEMPORAL CORRELATION

CAR FROM - 5 TO 0:	0.02820	0.12961	-0.03124	0.07397	0.02098	0.08880
STD.ERR./ FCST.CUM.:	0.04655	0.05743	0.03777	0.04027	0.03118	0.04058
STANDARDIZED CAR:	0.60574	2.25667	-0.82728	1.83675	0.67297	2.18827
SIGNIFICANCE LEVEL:	0.54180	0.02380	0.40660	0.06580	0.50280	0.02860

TABLE 4.12A

MEXICAN BANKING SYSTEM PRIVATIZATION OFFICIAL ANNOUNCEMENT (MAY 2, 1990)

TEST OF HYPOTHESIS FOR THE SIGNIFICANCE OF ABNORMAL RETURNS

MARKET MODEL ESTIMATION WITH 120 OBSERVATIONS:FROM-150 TO -30.

	MODEL 7	MODEL 8	MODEL 9	MODEL 10	MODEL 11	MODEL 12
	PORTF.1 /BNMX-30	PORTF.1 /IBMV	PORTF.2 /BNMX-30	PORTF.2 /IBMV	PORTF.3 /BNMX-30	PORTF.3 /IBMV
ABNORMAL RETURN / MAY 2, 1990.	0.06238	0.03334	0.04228	0.08351	0.05244	0.06187
ABNORMAL RETURN / MAY 3, 1990.	0.03239	0.03431	0.03365	0.05613	0.05092	0.05144
STD.ERR. WITHOUT ADJUSTMENT	0.01203	0.01478	0.01202	0.01441	0.00980	0.01280
STD.ERR./FCST., MAY 2,1990	0.01217	0.01555	0.01216	0.01516	0.00991	0.01346
STD.ERR./FCST., MAY 3,1990	0.01213	0.01511	0.01211	0.01473	0.00987	0.01308
SINGLE DAY EVENT WINDOW TEST STATISTICS:						
A) WITH UNADJUSTED STANDARD ERROR:						
MAY 2, 1990.	5.18448	5.65000	2.77417	3.62588	4.31469	4.83366
SIGNIFICANCE LEVEL:	<.0004	<.0004	0.00560	<.0004	<.0004	<.0004
MAY 3, 1990.	2.69169	3.55952	2.84669	3.53405	3.43437	4.01925
SIGNIFICANCE LEVEL:	0.00720	<.0004	0.00460	<.0004	0.00060	<.0004
B) WITH "FORECAST" ADJUSTED STANDARD ERROR:						
MAY 2, 1990.	5.12598	5.37068	2.74287	3.44662	4.26600	4.59470
SIGNIFICANCE LEVEL:	<.0004	<.0004	0.00640	0.00060	<.0004	<.0004
MAY 3, 1990.	2.66132	3.38354	2.81457	3.35933	3.39562	3.82055
SIGNIFICANCE LEVEL:	0.03840	0.00080	0.00500	0.00080	0.00080	<.0004
SEVERAL EVENT WINDOWS TEST STATISTICS ASSUMING INTERTEMPORAL CORRELATION:						
CAR FROM -30 TO 0	0.10045	0.12595	0.07891	0.10642	0.08554	0.11243
ST.D. FCST.CUM.	0.07521	0.09283	0.07512	0.09049	0.06124	0.08038
STANDARDIZED CAR	1.33564	1.35674	1.05047	1.17604	1.39671	1.39871
SIGNIFICANCE LEVEL:	0.18360	0.17700	0.29380	0.24200	0.16460	0.16460
CAR FROM -30 TO -16	0.12842	0.14487	0.12433	0.13911	0.12559	0.14088
ST.D. FCST.CUM.	0.04944	0.06083	0.04938	0.05930	0.04026	0.05267
STANDARDIZED CAR	2.59742	2.38144	2.51769	2.34588	3.11938	2.67458
SIGNIFICANCE LEVEL:	0.00960	0.01740	0.01180	0.01880	0.00180	0.00740
CAR FROM -15 TO 0	-0.02796	-0.01892	-0.04541	-0.03268	-0.04004	-0.02845
ST.D. FCST.CUM.	0.05127	0.06338	0.05121	0.06178	0.04175	0.05488
STANDARDIZED CAR	-0.54535	-0.29853	-0.88674	-0.52895	-0.95904	-0.51840
SIGNIFICANCE LEVEL:	0.58920	0.76420	0.37880	0.59620	0.34220	0.60300
CAR FROM -5 TO 0	0.00940	-0.00606	0.01765	0.00622	0.01511	0.00244
ST.D. FCST.CUM.	0.03020	0.03710	0.03167	0.03617	0.02460	0.03213
STANDARDIZED CAR	0.31136	-0.16323	0.58502	0.17201	0.61443	0.07606
SIGNIFICANCE LEVEL:	0.75660	0.87280	0.55520	0.86500	0.54860	0.94420

TABLE 4.13A

MEXICAN BANKING SYSTEM PRIVATIZATION OFFICIAL ANNOUNCEMENT (MAY 2, 1990).
TESTS OF HYPOTHESIS FOR THE SIGNIFICANCE OF ABNORMAL RETURNS,
USING THE SCHOLES AND WILLIAMS' ADJUSTED MARKET MODEL WITH 120 OBSERVATIONS.

	MODEL 7	MODEL 8	MODEL 9	MODEL 10	MODEL 11	MODEL 12
	PORTF.1 /BNMX-30	PORTF.1 /IBMV	PORTF.2 /BNMX-30	PORTF.2 /IBMV	PORTF.3 /BNMX-30	PORTF.3 /IBMV
ABNORMAL RETURN / MAY 2, 1990.	0.06863	0.08611	0.02573	0.04346	0.03893	0.05659
ABNORMAL RETURN / MAY 3, 1990.	0.03680	0.05425	0.02885	0.04557	0.03129	0.04824
STD.ERR. WITHOUT ADJUSTMENT	0.01212	0.01480	0.01215	0.01464	0.00983	0.01289
STD.ERR./FCST., MAY 2,1990	0.01303	0.01557	0.01306	0.01540	0.01056	0.01358
STD.ERR./FCST., MAY 3,1990	0.01260	0.01513	0.01263	0.01496	0.01022	0.01318
SINGLE DAY EVENT WINDOW TEST STATISTICS:						
A) WITH UNADJUSTED STANDARD ERROR:						
MAY 2, 1990.	5.66114	5.81839	2.11725	2.96980	3.96008	4.38886
SIGNIFICANCE LEVEL	<.0004	<.0004	0.03400	0.00300	0.00300	<.0004
MAY 3, 1990.	3.03589	3.66565	2.37340	3.11337	3.18322	3.74136
SIGNIFICANCE LEVEL	0.00240	<.0004	0.01780	0.00180	0.00140	<.0004
B) WITH "FORECAST"ADJUSTED STANDARD ERROR:						
MAYO 2, 1990.	5.26866	5.53075	1.97046	2.82299	3.68554	4.17189
SIGNIFICANCE LEVEL	<.0004	<.0004	0.04880	0.00480	<.0004	<.0004
MAYO 3, 1990.	2.92097	3.48444	2.20886	2.95946	2.96253	3.55640
SIGNIFICANCE LEVEL	0.00360	0.00060	0.02720	0.00300	0.00300	<.0004
SEVERAL DAYS EVENT WINDOWS TEST STATISTICS ASSUMING INTERTEMPORAL CORRELATION						
C.A.R. FROM -30 to 0	0.13499	0.14911	0.11686	0.13118	0.12242	0.13670
STD. ERR. OF FCST.CUM.	0.07609	0.09301	0.07628	0.09198	0.06170	0.08103
STANDARDIZED C.A.R.	1.77414	1.60313	1.53190	1.42611	1.98413	1.68694
SIGNIFICANCE LEVEL	0.07680	0.10960	0.12600	0.15280	0.04780	0.09100
C.A.R. FROM -30 TO -16	0.13499	0.14911	0.11686	0.13118	0.12242	0.13670
STD. ERR. OF FCST.CUM.	0.05003	0.06116	0.05016	0.06048	0.04057	0.05328
STANDARDIZED C.A.R.	2.69811	2.43820	2.32971	2.16898	3.01745	2.56569
SIGNIFICANCE LEVEL	0.00700	0.01420	0.01980	0.03000	0.00260	0.01020
C.A.R. FROM -15 to 0	-0.08687	-0.09866	-0.08244	-0.09118	-0.08381	-0.09348
STD. ERR. OF FCST.CUM.	0.05164	0.06313	0.05177	0.06243	0.04188	0.05499
STANDARDIZED C.A.R.	-1.68201	-1.56291	-1.59231	-1.46062	-2.00133	-1.69982
SIGNIFICANCE LEVEL	0.09300	0.11880	0.11180	0.14420	0.04560	0.09100
C.A.R. FROM -5 TO 0	-0.01786	-0.00661	-0.03134	-0.02156	-0.02720	0.00310
STD. ERR. OF FCST.CUM.	0.03044	0.03715	0.03051	0.03674	0.02468	0.03237
STANDARDIZED C.A.R.	-0.58688	-0.17799	-1.02713	-0.58695	-1.10198	0.09584
SIGNIFICANCE LEVEL	0.56200	0.85720	0.30300	0.55520	0.27140	0.92820

TABLE 4.14A

DIFFERENT GROUPS OF BANKS AUCTION ANNOUNCEMENTS

TESTS OF HYPOTHESIS FOR THE SIGNIFICANCE OF ABNORMAL RETURNS

MARKET MODEL ESTIMATION WITH 120 OBSERVATIONS

	MODEL 13	MODEL 14	MODEL 15	MODEL 16	MODEL 17	MODEL 18
	PORT.4 W/BNMX.30	PORT.4 W/IBMV	PORT.5 W/BNMX.30	PORT.5 W/IBMV	PORT.6 W/BNMX.30	PORT.6 W/IBMV
ABNORMAL RETURN ON DAY 0	0.02456	0.02805	-0.02009	-0.02125	0.02500	-0.00017
STD.ERR. WITHOUT ADJUSTMENT	0.01192	0.01219	0.01013	0.01031	0.01874	0.02186
STD.ERR. "FORECAST" ADJUSTED	0.01197	0.01224	0.01017	0.01035	0.01928	0.02206
SINGLE DAY EVENT WINDOW TEST STATISTICS:						
A) WITH UNDAJUSTED STANDARD ERRORS.						
ANNOUNCEMENT DAY (DAY 0)	2.06083	2.30058	-1.98380	-2.06108	1.33396	-0.00768
SIGNIFICANCE LEVEL	0.03940	0.02140	0.04780	0.03840	0.18360	1.00000
A) WITH UNDAJUSTED STANDARD ERRORS.						
ANNOUNCEMENT DAY (DAY 0)	2.05148	2.29065	-1.97484	-2.05254	1.29810	-0.00762
SIGNIFICANCE LEVEL	0.04040	0.02200	0.04880	0.04040	0.19700	1.00000
SEVERAL DAYS EVENT WINDOWS TEST STATISTICS ASSUMING INTERTEMPORAL CORRELATION						
CAR FROM -30 TO 0	0.14477	0.15760	0.02793	-0.00664	-0.046925673	-0.1575973
STD.ERR. OF FCST. CUM.	0.07462	0.07622	0.06347	0.06518	0.118013677	0.13661687
STANDARDIZED CAR	1.94018	2.06765	0.44002	-0.10195	-0.397629107	-1.1535712
SIGNIFICANCE LEVEL	0.05240	0.03940	0.66000	0.92040	0.69660	0.25020
CAR FROM -30 TO -16	0.02214	0.01746	0.06691	0.06759	-0.10965	-0.15963
STD.ERR. OF FCST. CUM.	0.04904	0.05014	0.04220	0.04270	0.07735	0.08987
STANDARDIZED CAR	0.45153	0.34831	1.58566	1.58287	-1.41756	-1.77621
SIGNIFICANCE LEVEL	0.65280	0.73380	0.11420	0.11420	0.15860	0.07680
CAR FROM -15 to 0	0.12263	0.14014	-0.03898	-0.07424	0.06273	0.00203
STD.ERR. OF FCST. CUM.	0.05140	0.05226	0.04315	0.04414	0.08016	0.09311
STANDARDIZED CAR	2.38553	2.68174	-0.90343	-1.68193	0.78252	0.02178
SIGNIFICANCE LEVEL	0.01800	0.00740	0.36820	0.09300	0.43540	0.98400
CAR FROM -5 TO 0	0.13682	0.14304	-0.00730	-0.00675	0.03594	0.01616
STD.ERR. OF FCST. CUM.	0.02996	0.03061	0.02544	0.02589	0.04728	0.05502
STANDARDIZED CAR	4.56729	4.67349	-0.28695	-0.26085	0.76050	0.29364
SIGNIFICANCE LEVEL	<.0004	<.0004	0.77940	0.78480	0.44720	0.77180

CONTINUATION OF TABLE 4.14A

DIFFERENT GROUPS OF BANKS AUCTION ANNOUNCEMENTS

TESTS OF HYPOTHESIS FOR THE SIGNIFICANCE OF ABNORMAL RETURNS

MARKET MODEL ESTIMATION WITH 120 OBSERVATIONS

	MODEL 19	MODEL 20	MODEL 21	MODEL 22	MODEL 23	MODEL 24
	PORT.7 W/BNMX.30	PORT.7 W/IBMV	PORT.8 W/BNMX.30	PORT.8 W/IBMV	PORT.9 W/BNMX.30	PORT.9 W/IBMV
ABNORMAL RETURN ON DAY 0	0.04554	0.05487	0.01287	0.01516	0.01535	0.01227
STD.ERR. WITHOUT ADJUSTMENT	0.01548	0.01723	0.01602	0.01785	0.01489	0.01734
STD.ERR. "FORECAST" ADJUSTED	0.01564	0.01730	0.01609	0.01795	0.01506	0.01757
SINGLE DAY EVENT WINDOW TEST STATISTICS:						
A) WITH UNDAJUSTED STANDARD ERRORS.						
ANNOUNCEMENT DAY (DAY 0)	2.94149	3.18438	0.80356	0.84912	1.03117	0.70760
SIGNIFICANCE LEVEL	0.00320	0.00140	0.42380	0.40100	0.30300	0.48400
B) WITH FORECAST ADJUSTED STANDARD ERRORS.						
ANNOUNCEMENT DAY (DAY 0)	2.91101	3.17070	0.80021	0.84466	1.01941	0.69830
SIGNIFICANCE LEVEL	0.00360	0.00220	0.42380	0.40100	0.31740	0.49020
SEVERAL DAYS EVENT WINDOWS TEST STATISTICS ASSUMING INTERTEMPORAL CORRELATION						
CAR FROM -30 TO 0	0.17777	0.19539	-0.04837	-0.02280	0.08993	0.17335
STD.ERR. OF FCST. CUM.	0.09672	0.10766	0.10034	0.11188	0.09320	0.10838
STANDARDIZED CAR	1.83806	1.81491	-0.48200	-0.20381	0.96490	1.59945
SIGNIFICANCE LEVEL	0.06720	0.07020	0.63120	0.84140	0.33700	0.11180
CAR FROM -30 TO -16	0.06720	0.06980	-0.04652	-0.05828	0.00881	0.04594
STD.ERR. OF FCST. CUM.	0.06360	0.07079	0.06593	0.07356	0.06142	0.07130
STANDARDIZED CAR	1.05661	0.98605	-0.70554	-0.79225	0.14338	0.64431
SIGNIFICANCE LEVEL	0.28380	0.32700	0.48400	0.42960	0.88860	0.52220
CAR FROM -15 to 0	0.11057	0.12559	-0.00185	0.03547	0.08112	0.12741
STD.ERR. OF FCST. CUM.	0.06596	0.07340	0.06917	0.07747	0.06340	0.07414
STANDARDIZED CAR	1.67647	1.71103	-0.02673	0.45787	1.27950	1.71853
SIGNIFICANCE LEVEL	0.50280	0.47780	0.98400	0.65280	0.20400	0.08720
CAR FROM -5 TO 0	0.13575	0.14469	0.00159	0.00983	0.01361	0.01389
STD.ERR. OF FCST. CUM.	0.03887	0.04328	0.04028	0.04487	0.03743	0.04366
STANDARDIZED CAR	3.49211	3.34325	0.03959	0.21905	0.36368	0.31822
SIGNIFICANCE LEVEL	0.00040	0.00080	0.97600	0.84140	0.71880	0.75660

TABLE 4.15A

DIFFERENT GROUPS OF BANKS AUCTION ANNOUNCEMENTS

TESTS OF HYPOTHESIS FOR THE SIGNIFICANCE OF ABNORMAL RETURNS

MARKET MODEL ESTIMATION WITH SCHOLES AND WILLIAMS ADJUSTMENT.

AND 120 OBSERVATIONS, FROM -150 TO -30.

	MODEL 13	MODEL 14	MODEL 15	MODEL 16	MODEL 17	MODEL 18
	PORT.4 W/BNMX.30	PORT.4 W/IBMV	PORT.5 W/BNMX.30	PORT.5 W/IBMV	PORT.6 W/BNMX.30	PORT.6 W/IBMV
ABNORMAL RETURN ON DAY 0	0.02378	0.02828	-0.00825	-0.01312	-0.01095	-0.00798
STD.ERR. WITHOUT ADJUSTMENT	0.01210	0.01235	0.01364	0.01013	0.02914	0.02537
STD.ERR. "FORECAST" ADJUSTED	0.01216	0.01240	0.01370	0.01018	0.02926	0.02549
SINGLE DAY EVENT WINDOW TEST STATISTICS:						
A) WITH UNDAJUSTED STANDARD ERRORS:						
ANNOUNCEMENT DAY (DAY 0)	1.96493	2.29000	-0.60463	-1.29575	-0.37569	-0.31452
SIGNIFICANCE LEVEL	0.05000	0.02200	0.54860	0.19360	0.71140	0.76420
B) WITH "FORECAST" AJUSTED STANDARD ERRORS.						
ANNOUNCEMENT DAY (DAY 0)	1.95602	2.28012	-0.60206	-1.28952	-0.37413	-0.31296
SIGNIFICANCE LEVEL	0.05000	0.02260	0.54860	0.19360	0.71140	0.76420
SEVERAL DAYS EVENT WINDOWS TEST STATISTICS ASSUMING INTERTEMPORAL CORRELATION:						
CAR FROM -30 TO 0	0.10659	0.11792	0 27546	0.05617	-0.09834	-0.12970
STD.ERR. OF FCST. CUM.	0.07575	0.07727	0.08518	0.06325	0.18257	0.15876
STANDARDIZED CAR	1.40711	1.52605	3.23397	0.88802	-0.53865	-0.81695
SIGNIFICANCE LEVEL	0.16160	0.12860	0.00120	0.37880	0.58920	0.41220
CAR FROM -30 TO -16	0.02561	0.01922	0.19840	0.07886	-0.07187	-0.13457
STD.ERR. OF FCST. CUM.	0.04980	0.05085	0.05651	0.04197	0.12167	0.10534
STANDARDIZED CAR	0.51422	0.37798	3.51085	1.87873	-0.59071	-1.27743
SIGNIFICANCE LEVEL	0.61000	0.70400	<.0004	0.06140	0.55520	0.20060
CAR FROM -15 to 0	0.08099	0.09870	0.07707	-0.02269	-0.02648	0.00486
STD.ERR. OF FCST. CUM.	0.05222	0.05326	0.05852	0.04341	0.12437	0.10817
STANDARDIZED CAR	1.55072	1.85305	1.31689	-0.52262	-0.21288	0.04496
SIGNIFICANCE LEVEL	0.12120	0.06440	0.18680	0.60300	0.83360	0.96800
CAR FROM -5 TO 0	0.10432	0.10889	0.05004	0.00801	0.05208	0.06659
STD.ERR. OF FCST. CUM.	0.03043	0.03103	0.03425	0.02542	0.07314	0.06367
STANDARDIZED CAR	3.42786	3.50869	1.46119	0.31506	0.71209	1.04588
SIGNIFICANCE LEVEL	0.00060	<.0004	0.14420	0.75660	0.47780	0.29840

CONTINUATION OF TABLE 4.16A
DIFFERENT GROUPS OF BANKS AUCTION ANNOUNCEMENTS
TESTS OF HYPOTHESIS FOR THE SIGNIFICANCE OF ABNORMAL RETURNS
MARKET MODEL ESTIMATION WITH SCHOLES AND WILLIAMS ADJUSTMENT.
AND 120 OBSERVATIONS, FROM -150 TO -30.

	MODEL 19	MODEL 20	MODEL 21	MODEL 22	MODEL 23	MODEL 24
	PORT.7 W/BNMX.30	PORT.7 W/IBMV	PORT.8 W/BNMX.30	PORT.8 W/IBMV	PORT.9 W/BNMX.30	PORT.9 W/IBMV
ABNORMAL RETURN ON DAY 0	0.04970	0.05552	-0.00016	0.02305	-0.02289	-0.00487
STD.ERR. WITHOUT ADJUSTMENT	0.01582	0.01738	0.02169	0.02068	0.02751	0.02534
STD.ERR. "FORECAST" ADJUSTED	0.01598	0.01745	0.02198	0.02078	0.02789	0.02545
SINGLE DAY EVENT WINDOW TEST STATISTICS:						
A) WITH UNDAJUSTED STANDARD ERRORS:						
ANNOUNCEMENT DAY (DAY 0)	3.14190	3.19548	-0.00741	1.11498	-0.83222	-0.19209
SIGNIFICANCE LEVEL	0.00160	0.00140	1.00000	0.26700	0.40660	0.84940
A) WITH UNDAJUSTED STANDARD ERRORS:						
ANNOUNCEMENT DAY (DAY 0)	3.10935	3.18176	-0.00732	1.10963	-0.82080	-0.19123
SIGNIFICANCE LEVEL	0.00180	0.00140	1.00000	0.26700	0.41220	0.84940
SEVERAL DAYS EVENT WINDOWS TEST STATISTICS ASSUMING INTERTEMPORAL CORRELATION:						
CAR FROM -30 TO 0	0.068162918	0.068277	-0.084855418	0.0768442	0.078144481	0.08234951
STD.ERR. OF FCST. CUM.	0.0987918	0.108587	0.135748181	0.1291661	0.171795283	0.15842591
STANDARDIZED CAR	0.689965335	0.628774	-0.625094325	0.5949252	0.454869772	0.51979827
SIGNIFICANCE LEVEL	0.49020	0.52860	0.52860	0.55520	0.65280	0.60300
CAR FROM -30 TO -16	0.06816	0.06828	-0.08486	0.07684	0.07814	0.08235
STD.ERR. OF FCST. CUM.	0.06498	0.07140	0.08920	0.08495	0.11299	0.10415
STANDARDIZED CAR	1.04903	0.95623	-0.95126	0.90461	0.69158	0.79066
SIGNIFICANCE LEVEL	0.29380	0.33700	0.34220	0.36820	0.49200	0.42960
CAR FROM -15 to 0	0.06864	0.07096	0.02203	0.19988	0.08836	0.10267
STD.ERR. OF FCST. CUM.	0.06736	0.07401	0.09249	0.08808	0.11713	0.10796
STANDARDIZED CAR	1.01909	0.95881	0.23821	2.26976	0.75435	0.95100
SIGNIFICANCE LEVEL	0.30780	0.33700	0.81800	0.02320	0.45320	0.34220
CAR FROM -5 TO 0	0.09470	0.09268	-0.00216	0.06360	0.07061	-0.05300
STD.ERR. OF FCST. CUM.	0.03971	0.04369	0.05445	0.05196	0.06908	0.06381
STANDARDIZED CAR	2.38469	2.12096	-0.03974	1.22411	1.02204	-0.83059
SIGNIFICANCE LEVEL	0.01740	0.03400	0.97600	0.22240	0.30780	0.40660

TABLE 4.16A

DIFFERENT PORTFOLIOS FOR BANKS SALEDATE EVENT
TESTS OF HYPOTHESIS FOR THE SIGNIFICANCE OF ABNORMAL RETURNS
MARKET MODEL INDIVIDUAL ESTIMATIONS WITH 120 OBSERVATIONS

	MODEL 25	MODEL 26	MODEL 27	MODEL 28	MODEL 29	MODEL 30
	PORT 10 BNMX-30	PORT 10 IBMV	PORT 11 BNMX-30	PORT 11 IBMV	PORT 12 BNMX-30	PORT 12 IBMV
ABNORMAL RET. ON SALEDATE	-0.02418	-0.02362	-0.00348	-0.00377	-0.00900	-0.00906
STD.ERR.WITHOUT ADJUSTMENT	0.01078	0.01239	0.00641	0.00666	0.00551	0.00590
STD.ERR."FORECAST"ADJUSTED	0.01083	0.01247	0.00647	0.00672	0.00556	0.00595
SINGLE EVENT WINDOW TEST STATISTICS:						
A) WITH UNADJUSTED STANDARD ERRORS:						
SALEDATE (DAY 0)	-2.24247	-1.90706	-0.54378	-0.56583	-1.63417	-1.53725
SIGNIFICANCE	0.02500	0.05740	0.58920	0.57540	0.10320	0.12600
B)WITH FORECAST ADJUSTED STANDARD ERRORS:						
SALEDATE (DAY 0)	-2.23169	-1.89361	-0.53829	-0.56042	-1.62000	-1.52377
SIGNIFICANCE	0.02640	0.05880	0.58920	0.57540	0.10520	0.12860
SEVERAL DAYS EVENT WINDOWS TEST STATISTICS ASSUMING INTERTEMPORAL CORRELATION:						
ACAR FROM -30 TO 0	-0.07774	-0.10508	0.02104	0.01721	0.00144	-0.00697
STD.ERR.OF FCST. CUM.	0.07000	0.07850	0.04213	0.04391	0.03548	0.03783
STANDARDIZED ACAR	-1.11056	-1.33857	0.49937	0.39204	0.04063	-0.18412
SIGNIFICANCE	0.26700	0.18360	0.62420	0.69660	0.96800	0.85720
ACAR FROM -15 TO 0	-0.08586	-0.07606	0.04851	0.04278	0.01983	0.01983
STD.ERR.OF FCST. CUM.	0.04580	0.05218	0.03040	0.04611	0.02497	0.03627
STANDARDIZED ACAR	-1.87477	-1.45770	1.59548	0.92775	0.79390	0.54681
SIGNIFICANCE	0.04880	0.14420	0.10960	0.35760	0.42960	0.58240

TABLE 4.17A

DIFFERENT PORTFOLIOS FOR BANKS SALEDATE EVENT
TESTS OF HYPOTHESIS FOR THE SIGNIFICANCE OF ABNORMAL RETURNS
MARKET MODEL INDIVIDUAL ESTIMATIONS WITH
SCHOLES AND WILLIAMS ADJUSTMENT AND 120 OBSERVATIONS.

	MODEL 25	MODEL 26	MODEL 27	MODEL 28	MODEL 29	MODEL 30
	PORT 10 BNMX-30	PORT 10 IBMV	PORT 11 BNMX-30	PORT 11 IBMV	PORT 12 BNMX-30	PORT 12 IBMV
ABNORMAL RET. ON SALEDATE	-0.01212	-0.01287	0.00975	0.01034	0.00392	0.00415
STD.ERR.WITHOUT ADJUSTMENT	0.01123	0.01256	0.00647	0.00655	0.00561	0.00586
STD.ERR."FORECAST"ADJUSTED	0.01128	0.01404	0.00655	0.00680	0.00566	0.01868
SINGLE EVENT WINDOW TEST STATISTICS:						
A) WITH UNADJUSTED STANDARD ERRORS:						
SALEDATE (DAY 0)	-1.07973	-1.02474	1.50670	1.57834	0.69828	0.70883
SIGNIFICANCE	0.28460	0.30780	0.13100	0.11640	0.49020	0.48400
B) WITH FORECAST ADJUSTED STANDARD ERRORS:						
SALEDATE (DAY 0)	-1.07445	-0.91656	1.49014	1.52078	0.69182	0.22222
SIGNIFICANCE	0.28460	0.35760	0.13620	0.12860	0.49020	0.82580
SEVERAL DAYS EVENT WINDOWS TEST STATISTICS ASSUMING INTERTEMPORAL CORRELATION:						
ACAR FROM -30 TO 0	-0.12398	-0.11760	0.02103	0.01668	-0.01763	-0.01913
STD.ERR.OF FCST. CUM.	0.09649	0.07766	0.05451	0.04154	0.04754	0.03684
STANDARDIZED ACAR	-1.28484	-1.51436	0.38586	0.40140	-0.37084	-0.51930
SIGNIFICANCE	0.20460	0.13100	0.70400	0.68920	0.71140	0.60300
ACAR FROM -15 TO 0	-0.11117	-0.10494	0.06026	0.05760	0.01454	0.01426
STD.ERR.OF FCST. CUM.	0.04629	0.05170	0.02696	0.02812	0.02331	0.02481
STANDARDIZED ACAR	-2.40162	-2.02972	2.23510	2.04842	0.62399	0.57468
SIGNIFICANCE	0.01640	0.04340	0.02580	0.04140	0.53520	0.56860

TABLE 4.18A

INDIVIDUAL SALE DATE EVENT

TESTS OF HYPOTHESIS FOR THE SIGNIFICANCE OF ABNORMAL RETURNS

MARKET MODEL ESTIMATION WITH 120 OBSERVATIONS

NAME OF BANK: ATLANTICO

	OLS MARKET MODEL		SW ADJUSTED MARKET MODEL	
	CONSTANT	BETA	CONSTANT	BETA
BNMX-30	0.00182	0.58513	0.00107	1.01774
IBMV	0.00203	0.36282	0.00104	0.69882

	BANAMEX-30	IBMV	BANAMEX-30	IBMV
ABNORMAL RETURN ON DAY 0	0.07393	0.07841	0.07305	0.08170
STD.ERR. WITHOUT ADJUSTMENT	0.01642	0.01720	0.01714	0.01764
STD.ERR."FORECAST" ADJUSTED	0.01648	0.01733	0.01721	0.01777

SINGLE DAY EVENT WINDOW TEST STATISTICS:

A) WITH UNADJUSTED STANDARD ERRORS:

SALEDATE (DAY 0)	4.50378	4.55864	4.26288	4.63169
SIGNIFICANCE LEVEL	<.0004	<.0004	<.0004	<.0004

B) WITH FORECAST ADJUSTED STANDARD ERRORS:

SALEDATE (DAY 0)	4.48492	4.52465	4.24503	4.59715
SIGNIFICANCE LEVEL	<.0004	<.0004	<.0004	<.0004

SEVERAL DAYS EVENT WINDOWS TEST STATISTICS , ASSUMING INTERTEMP. CORREL.

CAR FROM -30 to 0	0.36716	0.41115	0.33362	0.41754
STD.ERR. OF FCST. CUM.	0.13948	0.10555	0.14560	0.10824
STANDARDIZED CAR	2.63235	3.89520	2.29136	3.85739
SIGNIFICANCE LEVEL	0.00860	<.0004	0.02200	<.0004
CAR FROM -15 to 0	0.31654	0.35053	0.28801	0.34997
STD.ERR. OF FCST. CUM.	0.06780	0.07067	0.07077	0.07247
STANDARDIZED CAR	4.66879	4.96039	4.06941	4.82940
SIGNIFICANCE LEVEL	<.0004	<.0004	<.0004	<.0004
CAR 5	0.23981	0.24049	0.24509	0.24896
STD.ERR. OF FCST. CUM.	0.03753	0.03944	0.03917	0.04045
STANDARDIZED CAR	6.39060	6.09720	6.25672	6.15507
SIGNIFICANCE LEVEL	<.0004	<.0004	<.0004	<.0004

TABLE 4.19A

INDIVIDUAL SALE DATE EVENT

TESTS OF HYPOTHESIS FOR THE SIGNIFICANCE OF ABNORMAL RETURNS

MARKET MODEL ESTIMATION WITH 120 OBSERVATIONS

NAME OF BANK: BANCEN

	OLS MARKET MODEL		SW ADJUSTED MARKET MODEL	
	CONSTANT	BETA	CONSTANT	BETA
BNMX-30	0.00045	0.75727	0.00006	0.94645
IBMV	0.00055	0.57095	0.00000	0.76714

	BANAMEX-30	IBMV	BANAMEX-30	IBMV
ABNORMAL RETURN ON DAY 0	0.01780	0.02014	0.01845	0.02187
STD.ERR. WITHOUT ADJUSTMENT	0.02440	0.02490	0.02451	0.02504
STD.ERR."FORECAST" ADJUSTED	0.02451	0.02505	0.02462	0.02518

SINGLE DAY EVENT WINDOW TEST STATISTICS:

A) WITH UNADJUSTED STANDARD ERRORS:

SALEDATE (DAY 0)	0.72959	0.80885	0.75262	0.87364
SIGNIFICANCE LEVEL	0.46540	0.41800	0.45320	0.38440

B) WITH FORECAST ADJUSTED STANDARD ERRORS:

SALEDATE (DAY 0)	0.72634	0.80415	0.74926	0.86855
SIGNIFICANCE LEVEL	0.46540	0.42380	0.45320	0.38440

SEVERAL DAYS EVENT WINDOWS TEST STATISTICS , ASSUMING INTERTEMP. CORREL.

CAR FROM -30 to 0	0.01749	0.01870	0.04065	0.05248
STD.ERR. OF FCST. CUM.	0.20770	0.15407	0.20859	0.15491
STANDARDIZED CAR	0.08421	0.12135	0.19488	0.33862
SIGNIFICANCE LEVEL	0.93620	0.90440	0.84940	0.73380
CAR FROM -15 to 0	0.00378	0.00189	0.01552	0.01810
STD.ERR. OF FCST. CUM.	0.10089	0.10314	0.10132	0.10370
STANDARDIZED CAR	0.03748	0.01835	0.15314	0.17458
SIGNIFICANCE LEVEL	0.97600	0.98400	0.88080	0.86500
CAR 5	-0.05559	-0.05230	-0.06066	-0.05789
STD.ERR. OF FCST. CUM.	0.05593	0.05707	0.05617	0.05738
STANDARDIZED CAR	-0.99406	-0.91644	-1.07998	-1.00891
SIGNIFICANCE LEVEL	0.32220	0.35760	0.28020	0.31740

TABLE 4.20A

INDIVIDUAL SALE DATE EVENT

TESTS OF HYPOTHESIS FOR THE SIGNIFICANCE OF ABNORMAL RETURNS

MARKET MODEL ESTIMATION WITH 120 OBSERVATIONS

NAME OF BANK: BANORIE

	OLS MARKET MODEL		SW ADJUSTED MARKET MODEL	
	CONSTANT	BETA	CONSTANT	BETA
BNMX-30	0.00133	0.14335	0.00064	0.27413
IBMV	0.00196	-0.00230	0.00217	-0.03831

	BANAMEX-30	IBMV	BANAMEX-30	IBMV
ABNORMAL RETURN ON DAY 0	0.00023	-0.00198	0.00235	-0.00244
STD.ERR. WITHOUT ADJUSTMENT	0.01602	0.01615	0.01613	0.01616
STD.ERR."FORECAST" ADJUSTED	0.01616	0.01625	0.01627	0.01626

SINGLE DAY EVENT WINDOW TEST STATISTICS:

A) WITH UNADJUSTED STANDARD ERRORS:

SALEDATE (DAY 0)	0.01458	-0.12262	0.14569	-0.15099
SIGNIFICANCE LEVEL	0.99200	0.90440	0.88080	0.88080

B) WITH FORECAST ADJUSTED STANDARD ERRORS:

SALEDATE (DAY 0)	0.01445	-0.12189	0.14439	-0.15009
SIGNIFICANCE LEVEL	0.99200	0.90440	0.88860	0.88080

SEVERAL DAYS EVENT WINDOWS TEST STATISTICS , ASSUMING INTERTEMP. CORREL.

CAR FROM -30 to 0	-0.10113	-0.12647	-0.07440	-0.13016
STD.ERR. OF FCST. CUM.	0.13507	0.10047	0.13598	0.10054
STANDARDIZED CAR	-0.74869	-1.25882	-0.54717	-1.29466
SIGNIFICANCE LEVEL	0.45920	0.20760	0.58240	0.19700
CAR FROM -15 to 0	-0.10723	-0.13118	-0.08382	-0.13628
STD.ERR. OF FCST. CUM.	0.06798	0.06716	0.06844	0.06721
STANDARDIZED CAR	-1.57737	-1.95329	-1.22485	-2.02773
SIGNIFICANCE LEVEL	0.11420	0.05120	0.22240	0.04240
CAR 5	-0.05676	-0.06657	-0.04734	-0.06902
STD.ERR. OF FCST. CUM.	0.03722	0.03723	0.03747	0.03726
STANDARDIZED CAR	-1.52517	-1.78809	-1.26344	-1.85245
SIGNIFICANCE LEVEL	0.12600	0.07340	0.20760	0.06600

TABLE 4.21A

INDIVIDUAL SALE DATE EVENT

TESTS OF HYPOTHESIS FOR THE SIGNIFICANCE OF ABNORMAL RETURNS

MARKET MODEL ESTIMATION WITH 120 OBSERVATIONS

NAME OF BANK: BANORO

	OLS MARKET MODEL		SW ADJUSTED MARKET MODEL	
	CONSTANT	BETA	CONSTANT	BETA
BNMX-30	0.00039	1.14496	0.00029	1.23459
IBMV	0.00136	0.67885	0.00112	0.77706

	BANAMEX-30	IBMV	BANAMEX-30	IBMV
ABNORMAL RETURN ON DAY 0	-0.00590	-0.00357	-0.00743	-0.00585
STD.ERR. WITHOUT ADJUSTMENT	0.01957	0.02174	0.01959	0.02177
STD.ERR."FORECAST" ADJUSTED	0.01983	0.02220	0.01985	0.02223

SINGLE DAY EVENT WINDOW TEST STATISTICS:

A) WITH UNADJUSTED STANDARD ERRORS:

SALEDATE (DAY 0)	-0.30166	-0.16407	-0.37915	-0.26885
SIGNIFICANCE LEVEL	0.76420	0.87280	0.70400	0.78720

B) WITH FORECAST ADJUSTED STANDARD ERRORS:

SALEDATE (DAY 0)	-0.29776	-0.16066	-0.37424	-0.26328
SIGNIFICANCE LEVEL	0.76420	0.87280	0.71140	0.79480

SEVERAL DAYS EVENT WINDOWS TEST STATISTICS , ASSUMING INTERTEMP. CORREL.

CAR FROM -30 to 0	0.17561	0.19693	0.17558	0.20597
STD.ERR. OF FCST. CUM.	0.16531	0.13342	0.16548	0.13359
STANDARDIZED CAR	1.06233	1.47601	1.06103	1.54181
SIGNIFICANCE LEVEL	0.28920	0.13880	0.28920	0.12360
CAR FROM -15 to 0	0.12729	0.09804	0.13082	0.10322
STD.ERR. OF FCST. CUM.	0.08108	0.09000	0.08116	0.09012
STANDARDIZED CAR	1.57004	1.08926	1.61176	1.14539
SIGNIFICANCE LEVEL	0.11640	0.27580	0.10740	0.25020
CAR 5	-0.00223	-0.01372	-0.00085	-0.01187
STD.ERR. OF FCST. CUM.	0.04483	0.04978	0.04488	0.04984
STANDARDIZED CAR	-0.04978	-0.27561	-0.01903	-0.23812
SIGNIFICANCE LEVEL	0.96020	0.77940	0.98400	0.81040

TABLE 4.22A

INDIVIDUAL SALE DATE EVENT

TESTS OF HYPOTHESIS FOR THE SIGNIFICANCE OF ABNORMAL RETURNS

MARKET MODEL ESTIMATION WITH 120 OBSERVATIONS

NAME OF BANK: BANORTE

	OLS MARKET MODEL		SW ADJUSTED MARKET MODEL	
	CONSTANT	BETA	CONSTANT	BETA
BNMX-30	0.00110	1.29081	0.00073	1.49717
IBMV	0.00179	0.93778	0.00144	1.11243

	BANAMEX-30	IBMV	BANAMEX-30	IBMV
ABNORMAL RETURN ON DAY 0	-0.00360	-0.00341	0.00230	0.00356
STD.ERR. WITHOUT ADJUSTMENT	0.02136	0.02358	0.02152	0.02371
STD.ERR."FORECAST" ADJUSTED	0.02192	0.02451	0.02208	0.02464

SINGLE DAY EVENT WINDOW TEST STATISTICS:

A) WITH UNADJUSTED STANDARD ERRORS:

SALEDATE (DAY 0)	-0.16872	-0.14459	0.10703	0.15037
SIGNIFICANCE LEVEL	0.86500	0.88860	0.91240	0.88080

B) WITH FORECAST ADJUSTED STANDARD ERRORS:

SALEDATE (DAY 0)	-0.16442	-0.13911	0.10430	0.14468
SIGNIFICANCE LEVEL	0.87280	0.88860	0.92040	0.88860

SEVERAL DAYS EVENT WINDOWS TEST STATISTICS , ASSUMING INTERTEMP. CORREL.

CAR FROM -30 to 0	0.00517	-0.03052	0.02792	-0.00886
STD.ERR. OF FCST. CUM.	0.18299	0.14598	0.18436	0.14674
STANDARDIZED CAR	0.02827	-0.20906	0.15144	-0.06041
SIGNIFICANCE LEVEL	0.97600	0.83360	0.88080	0.95220
CAR FROM -15 to 0	-0.00540	-0.00668	0.00591	0.00712
STD.ERR. OF FCST. CUM.	0.08829	0.09782	0.08895	0.09833
STANDARDIZED CAR	-0.06116	-0.06832	0.06642	0.07243
SIGNIFICANCE LEVEL	0.95220	0.94420	0.94420	0.94420
CAR 5	-0.03290	-0.02820	-0.02156	-0.01382
STD.ERR. OF FCST. CUM.	0.04956	0.05544	0.04993	0.05573
STANDARDIZED CAR	-0.66389	-0.50875	-0.43175	-0.24805
SIGNIFICANCE LEVEL	0.50920	0.61000	0.66720	0.80260

TABLE 4.23A

INDIVIDUAL SALE DATE EVENT

TESTS OF HYPOTHESIS FOR THE SIGNIFICANCE OF ABNORMAL RETURNS

MARKET MODEL ESTIMATION WITH 120 OBSERVATIONS

NAME OF BANK: BANCOMER

	OLS MARKET MODEL		SW ADJUSTED MARKET MODEL	
	CONSTANT	BETA	CONSTANT	BETA
BNMX-30	0.00198	1.21204	0.00252	1.04385
IBMV	0.00244	0.62100	0.00359	0.38047

	BANAMEX-30	IBMV	BANAMEX-30	IBMV
ABNORMAL RETURN ON DAY 0	0.07708	0.08383	0.07703	0.08126
STD.ERR. WITHOUT ADJUSTMENT	0.02308	0.02706	0.02321	0.02735
STD.ERR."FORECAST" ADJUSTED	0.02318	0.02721	0.02330	0.02751

SINGLE DAY EVENT WINDOW TEST STATISTICS:

A) WITH UNADJUSTED STANDARD ERRORS:

SALEDATE (DAY 0)	3.33952	3.09798	3.31919	2.97101
SIGNIFICANCE LEVEL	0.00080	0.00200	0.00100	0.00300

B) WITH FORECAST ADJUSTED STANDARD ERRORS:

SALEDATE (DAY 0)	3.32587	3.08047	3.30543	2.95422
SIGNIFICANCE LEVEL	0.00080	0.00200	0.00100	0.00320

SEVERAL DAYS EVENT WINDOWS TEST STATISTICS , ASSUMING INTERTEMP. CORREL.

CAR FROM -30 to 0	0.08301	0.11335	0.07725	0.09099
STD.ERR. OF FCST. CUM.	0.19757	0.16572	0.19865	0.16749
STANDARDIZED CAR	0.42016	0.68395	0.38887	0.54323
SIGNIFICANCE LEVEL	0.67440	0.49660	0.69660	0.58920
CAR FROM -15 to 0	0.04501	0.07293	0.04743	0.07153
STD.ERR. OF FCST. CUM.	0.09490	0.11117	0.09541	0.11235
STANDARDIZED CAR	0.47430	0.65603	0.49712	0.63663
SIGNIFICANCE LEVEL	0.63840	0.50920	0.61700	0.52220
CAR 5	0.09365	0.10520	0.09209	0.09724
STD.ERR. OF FCST. CUM.	0.05268	0.06191	0.05297	0.06257
STANDARDIZED CAR	1.77769	1.69918	1.73845	1.55400
SIGNIFICANCE LEVEL	0.07500	0.08920	0.08180	0.12120

TABLE 4.24A

INDIVIDUAL SALE DATE EVENT

TESTS OF HYPOTHESIS FOR THE SIGNIFICANCE OF ABNORMAL RETURNS

MARKET MODEL ESTIMATION WITH 120 OBSERVATIONS

NAME OF BANK: BANAMEX

	OLS MARKET MODEL		SW ADJUSTED MARKET MODEL	
	CONSTANT	BETA	CONSTANT	BETA
BNMX-30	0.00165	1.04544	0.00300	0.37307
IBMV	0.00082	0.75811	0.00485	0.02055

	BANAMEX-30	IBMV	BANAMEX-30	IBMV
ABNORMAL RETURN ON DAY 0	0.01961	0.00968	0.02077	0.01991
STD.ERR. WITHOUT ADJUSTMENT	0.01955	0.02261	0.02050	0.02226
STD.ERR."FORECAST" ADJUSTED	0.01963	0.02278	0.02059	0.02243

SINGLE DAY EVENT WINDOW TEST STATISTICS:

A) WITH UNADJUSTED STANDARD ERRORS:

SALEDATE (DAY 0)	1.00309	0.42820	1.01313	0.89463
SIGNIFICANCE LEVEL	0.31740	0.66720	0.31240	0.37340

B) WITH FORECAST ADJUSTED STANDARD ERRORS:

SALEDATE (DAY 0)	0.99888	0.42501	1.00888	0.88795
SIGNIFICANCE LEVEL	0.31740	0.66720	0.31240	0.37340

SEVERAL DAYS EVENT WINDOWS TEST STATISTICS , ASSUMING INTERTEMP. CORREL.

CAR FROM -30 to 0	0.02716	-0.03040	-0.04444	-0.11958
STD.ERR. OF FCST. CUM.	0.16469	0.14245	0.17277	0.14020
STANDARDIZED CAR	0.16490	-0.21344	-0.25720	-0.85296
SIGNIFICANCE LEVEL	0.87280	0.83360	0.79480	0.39540
CAR FROM -15 to 0	-0.00670	-0.02642	-0.02843	-0.05794
STD.ERR. OF FCST. CUM.	0.08112	0.09307	0.08510	0.09160
STANDARDIZED CAR	-0.08264	-0.28384	-0.33406	-0.63255
SIGNIFICANCE LEVEL	0.93620	0.77940	0.74140	0.52860
CAR 5	0.05105	0.05720	0.09607	0.11337
STD.ERR. OF FCST. CUM.	0.04526	0.05261	0.04748	0.05178
STANDARDIZED CAR	1.12792	1.08728	2.02348	2.18951
SIGNIFICANCE LEVEL	0.25840	0.27580	0.04340	0.02860

TABLE 4.25A

INDIVIDUAL SALE DATE EVENT

TESTS OF HYPOTHESIS FOR THE SIGNIFICANCE OF ABNORMAL RETURNS

MARKET MODEL ESTIMATION WITH 120 OBSERVATIONS

NAME OF BANK: COMERMEX

	OLS MARKET MODEL		SW ADJUSTED MARKET MODEL	
	CONSTANT	BETA	CONSTANT	BETA
BNMX-30	0.00165	1.04544	0.00168	0.83710
IBMV	0.00082	0.75811	0.00071	0.80989

	BANAMEX-30	IBMV	BANAMEX-30	IBMV
ABNORMAL RETURN ON DAY 0	-0.10977	-0.11428	-0.10809	-0.11510
STD.ERR. WITHOUT ADJUSTMENT	0.02227	0.02434	0.02244	0.02435
STD.ERR."FORECAST" ADJUSTED	0.02240	0.02461	0.02257	0.02462

SINGLE DAY EVENT WINDOW TEST STATISTICS:

A) WITH UNADJUSTED STANDARD ERRORS:

SALEDATE (DAY 0)	-4.92809	-4.69494	-4.81604	-4.72709
SIGNIFICANCE LEVEL	<.0004	<.0004	<.0004	<.0004

B) WITH FORECAST ADJUSTED STANDARD ERRORS:

SALEDATE (DAY 0)	-4.90098	-4.64414	-4.78954	-4.67595
SIGNIFICANCE LEVEL	<.0004	<.0004	<.0004	<.0004

SEVERAL DAYS EVENT WINDOWS TEST STATISTICS , ASSUMING INTERTEMP. CORREL.

CAR FROM -30 to 0	-0.19247	-0.19158	-0.16667	-0.19860
STD.ERR. OF FCST. CUM.	0.19392	0.15012	0.19540	0.15018
STANDARDIZED CAR	-0.99253	-1.27613	-0.85299	-1.32240
SIGNIFICANCE LEVEL	0.32220	0.20060	0.39540	0.18680
CAR FROM -15 to 0	-0.13820	-0.15920	-0.13568	-0.16065
STD.ERR. OF FCST. CUM.	0.09151	0.10017	0.09220	0.10021
STANDARDIZED CAR	-1.51028	-1.58927	-1.47148	-1.60312
SIGNIFICANCE LEVEL	0.13100	0.11180	0.14160	0.10960
CAR 5	-0.07010	-0.07541	-0.06712	-0.07651
STD.ERR. OF FCST. CUM.	0.05087	0.05570	0.05126	0.05572
STANDARDIZED CAR	-1.37809	-1.35382	-1.30954	-1.37304
SIGNIFICANCE LEVEL	0.17060	0.17700	0.19020	0.17060

TABLE 4.26A

INDIVIDUAL SALE DATE EVENT

TESTS OF HYPOTHESIS FOR THE SIGNIFICANCE OF ABNORMAL RETURNS

MARKET MODEL ESTIMATION WITH 120 OBSERVATIONS

NAME OF BANK: CONFIA

	OLS MARKET MODEL		SW ADJUSTED MARKET MODEL	
	CONSTANT	BETA	CONSTANT	BETA
BNMX-30	0.00508	0.20065	0.00424	0.39672
IBMV	0.00554	0.10014	0.00559	0.10558

	BANAMEX-30	IBMV	BANAMEX-30	IBMV
ABNORMAL RETURN ON DAY 0	-0.00261	-0.00434	0.00063	-0.00433
STD.ERR. WITHOUT ADJUSTMENT	0.02623	0.02634	0.02636	0.02634
STD.ERR."FORECAST" ADJUSTED	0.02650	0.02655	0.02664	0.02655

SINGLE DAY EVENT WINDOW TEST STATISTICS:

A) WITH UNADJUSTED STANDARD ERRORS:

SALEDATE (DAY 0)	-0.09965	-0.16487	0.02404	-0.16433
SIGNIFICANCE LEVEL	0.92040	0.87280	0.98400	0.87280

B) WITH FORECAST ADJUSTED STANDARD ERRORS:

SALEDATE (DAY 0)	-0.09863	-0.16354	0.02379	-0.16301
SIGNIFICANCE LEVEL	0.92040	0.87280	0.98400	0.87280

SEVERAL DAYS EVENT WINDOWS TEST STATISTICS , ASSUMING INTERTEMP. CORREL.

CAR FROM -30 to 0				
STD.ERR. OF FCST. CUM.	-0.15023	-0.18392	-0.11442	-0.18601
STANDARDIZED CAR	0.21951	0.16453	0.22062	0.16453
SIGNIFICANCE LEVEL	-0.68436	-1.11787	-0.51862	-1.13058
	0.49660	0.26280	0.60300	0.25840
CAR FROM -15 to 0				
STD.ERR. OF FCST. CUM.	-0.06720	-0.08255	-0.04584	-0.08328
STANDARDIZED CAR	0.10955	0.10871	0.11010	0.10871
SIGNIFICANCE LEVEL	-0.61344	-0.75937	-0.41634	-0.76613
	0.54180	0.44720	0.67440	0.44120
CAR 5				
STD.ERR. OF FCST. CUM.	-0.02575	-0.02828	-0.02190	-0.02857
STANDARDIZED CAR	0.05998	0.06016	0.06028	0.06016
SIGNIFICANCE LEVEL	-0.42925	-0.47016	-0.36322	-0.47493
	0.66720	0.63840	0.71880	0.63840

TABLE 4.27A

INDIVIDUAL SALE DATE EVENT

TESTS OF HYPOTHESIS FOR THE SIGNIFICANCE OF ABNORMAL RETURNS

MARKET MODEL ESTIMATION WITH 120 OBSERVATIONS

NAME OF BANK: CREMI

	OLS MARKET MODEL		SW ADJUSTED MARKET MODEL	
	CONSTANT	BETA	CONSTANT	BETA
BNMX-30	0.00247	0.14920	0.00166	0.41201
IBMV	0.00259	0.08075	0.00159	0.32419

	BANAMEX-30	IBMV	BANAMEX-30	IBMV
ABNORMAL RETURN ON DAY 0	-0.01429	-0.01618	-0.00657	-0.00867
STD.ERR. WITHOUT ADJUSTMENT	0.01515	0.01521	0.01552	0.01572
STD.ERR."FORECAST" ADJUSTED	0.01555	0.01550	0.01592	0.01602

SINGLE DAY EVENT WINDOW TEST STATISTICS:

A) WITH UNADJUSTED STANDARD ERRORS:

SALEDATE (DAY 0)	-0.94310	-1.06337	-0.42376	-0.55137
SIGNIFICANCE LEVEL	0.34720	0.28920	0.67440	0.58240

B) WITH FORECAST ADJUSTED STANDARD ERRORS:

SALEDATE (DAY 0)	-0.91899	-1.04352	-0.41293	-0.54107
SIGNIFICANCE LEVEL	0.35760	0.29840	0.68180	0.58920

SEVERAL DAYS EVENT WINDOWS TEST STATISTICS , ASSUMING INTERTEMP. CORREL.

CAR FROM -30 to 0				
STD.ERR. OF FCST. CUM.	0.34632	0.36903	0.31591	0.38527
STANDARDIZED CAR	0.12812	0.09392	0.13121	0.09709
SIGNIFICANCE LEVEL	2.70308	3.92914	2.40765	3.96804
	..007	<.0004	0.01600	<.0004
CAR FROM -15 to 0				
STD.ERR. OF FCST. CUM.	0.47775	0.48519	0.48274	0.51602
STANDARDIZED CAR	0.06227	0.06344	0.06377	0.06559
SIGNIFICANCE LEVEL	7.67203	7.64742	7.56942	7.86776
	<.0004	<.0004	<.0004	<.0004
CAR 5				
STD.ERR. OF FCST. CUM.	0.09913	0.09920	0.10771	0.11404
STANDARDIZED CAR	0.03476	0.03511	0.03560	0.03630
SIGNIFICANCE LEVEL	2.85181	2.82530	3.02547	3.14196
	0.00440	0.00460	0.00240	0.00160

TABLE 4.28A

INDIVIDUAL SALE DATE EVENT

TESTS OF HYPOTHESIS FOR THE SIGNIFICANCE OF ABNORMAL RETURNS

MARKET MODEL ESTIMATION WITH 120 OBSERVATIONS

NAME OF BANK: INTERNACIONAL

	OLS MARKET MODEL		SW ADJUSTED MARKET MODEL	
	CONSTANT	BETA	CONSTANT	BETA
BNMX-30	-0.00015	1.28300	-0.00029	1.41029
IBMV	-0.00012	0.94130	-0.00003	0.93940

	BANAMEX-30	IBMV	BANAMEX-30	IBMV
ABNORMAL RETURN ON DAY 0	-0.05620	-0.05384	-0.05644	-0.05393
STD.ERR. WITHOUT ADJUSTMENT	0.02423	0.02598	0.02429	0.02598
STD.ERR."FORECAST" ADJUSTED	0.02434	0.02609	0.02439	0.02609

SINGLE DAY EVENT WINDOW TEST STATISTICS:

A) WITH UNADJUSTED STANDARD ERRORS:

SALEDATE (DAY 0)	-2.31921	-2.07225	-2.32367	-2.07565
SIGNIFICANCE LEVEL	0.02040	0.03840	0.02040	0.03760

B) WITH FORECAST ADJUSTED STANDARD ERRORS:

SALEDATE (DAY 0)	-2.30945	-2.06367	-2.31390	-2.06705
SIGNIFICANCE LEVEL	0.02080	0.03940	0.02080	0.03760

SEVERAL DAYS EVENT WINDOWS TEST STATISTICS , ASSUMING INTERTEMP. CORREL.

CAR FROM -30 to 0				
STD.ERR. OF FCST. CUM.	-0.16172	-0.15575	-0.14669	-0.15880
STANDARDIZED CAR	0.20672	0.16079	0.20719	0.16079
SIGNIFICANCE LEVEL	-0.78231	-0.96861	-0.70796	-0.98760
	0.43540	0.33200	0.47780	0.32220
CAR FROM -15 to 0				
STD.ERR. OF FCST. CUM.	-0.05637	-0.05725	-0.03968	-0.05891
STANDARDIZED CAR	0.10238	0.11125	0.10261	0.11126
SIGNIFICANCE LEVEL	-0.55058	-0.51455	-0.38670	-0.52949
	0.58240	0.61000	0.69660	0.59620
CAR 5				
STD.ERR. OF FCST. CUM.	-0.07852	-0.07037	-0.07742	-0.07085
STANDARDIZED CAR	0.05533	0.05942	0.05546	0.05942
SIGNIFICANCE LEVEL	-1.41904	-1.18441	-1.39602	-1.19249
	0.15560	0.23800	0.16160	0.23400

TABLE 4.28A

INDIVIDUAL SALE DATE EVENT

TESTS OF HYPOTHESIS FOR THE SIGNIFICANCE OF ABNORMAL RETURNS

MARKET MODEL ESTIMATION WITH 120 OBSERVATIONS

NAME OF BANK: MERCANTIL DE MEXICO

	OLS MARKET MODEL		SW ADJUSTED MARKET MODEL	
	CONSTANT	BETA	CONSTANT	BETA
BNMX-30	0.00238	0.21490	0.00168	0.64442
IBMV	0.00275	0.06803	0.00218	0.38768

	BANAMEX-30	IBMV	BANAMEX-30	IBMV
ABNORMAL RETURN ON DAY 0	0.09148	0.09546	0.08352	0.09608
STD.ERR. WITHOUT ADJUSTMENT	0.01823	0.01863	0.01846	0.01883
STD.ERR."FORECAST" ADJUSTED	0.01844	0.01871	0.01868	0.01891

SINGLE DAY EVENT WINDOW TEST STATISTICS:

A) WITH UNADJUSTED STANDARD ERRORS:

SALEDATE (DAY 0)	5.01868	5.12322	4.52338	5.10244
SIGNIFICANCE LEVEL	<.0004	<.0004	<.0004	<.0004

B) WITH FORECAST ADJUSTED STANDARD ERRORS:

SALEDATE (DAY 0)	4.96163	5.10127	4.47197	5.08058
SIGNIFICANCE LEVEL	<.0004	< .0004	<.0004	<.0004

SEVERAL DAYS EVENT WINDOWS TEST STATISTICS , ASSUMING INTERTEMP. CORREL.

CAR FROM -30 to 0				
STD.ERR. OF FCST. CUM.	0.26361	0.29260	0.17763	0.24701
STANDARDIZED CAR	0.13097	0.11619	0.13266	0.11742
SIGNIFICANCE LEVEL	2.01280	2.51837	1.33900	2.10371
	0.04440	0.01180	0.18020	0.03580
CAR FROM -15 to 0				
STD.ERR. OF FCST. CUM.	0.37963	0.40608	0.31555	0.38956
STANDARDIZED CAR	0.07684	0.07662	0.07783	0.07743
SIGNIFICANCE LEVEL	4.94071	5.29990	4.05428	5.03095
	<.0004	<.0004	<.0004	<.0004
CAR 5				
STD.ERR. OF FCST. CUM.	0.12534	0.13349	0.10933	0.13745
STANDARDIZED CAR	0.04181	0.04256	0.04235	0.04301
SIGNIFICANCE LEVEL	2.99768	3.13630	2.58139	3.19544
	0.00280	0.00160	0.00980	0.00140

TABLE 4.30A

INDIVIDUAL SALE DATE EVENT

TESTS OF HYPOTHESIS FOR THE SIGNIFICANCE OF ABNORMAL RETURNS

MARKET MODEL ESTIMATION WITH 120 OBSERVATIONS

NAME OF BANK: PROMEX

	OLS MARKET MODEL		SW ADJUSTED MARKET MODEL	
	CONSTANT	BETA	CONSTANT	BETA
BNMX-30	0.00343	0.07687	0.00286	0.36284
IBMV	0.00368	-0.01677	0.00344	0.08614

	BANAMEX-30	IBMV	BANAMEX-30	IBMV
ABNORMAL RETURN ON DAY 0	-0.00731	-0.00968	-0.00019	-0.00722
STD.ERR. WITHOUT ADJUSTMENT	0.01707	0.01709	0.01733	0.01712
STD.ERR."FORECAST" ADJUSTED	0.01755	0.01751	0.01782	0.01755

SINGLE DAY EVENT WINDOW TEST STATISTICS:

A) WITH UNADJUSTED STANDARD ERRORS:

SALEDATE (DAY 0)	-0.42838	-0.56670	-0.01078	-0.42148
SIGNIFICANCE LEVEL	0.66720	0.56860	0.99200	0.67440

B) WITH FORECAST ADJUSTED STANDARD ERRORS:

SALEDATE (DAY 0)	-0.41652	-0.55297	-0.01048	-0.41127
SIGNIFICANCE LEVEL	0.67440	0.58240	0.99200	0.68180

SEVERAL DAYS EVENT WINDOWS TEST STATISTICS , ASSUMING INTERTEMP. CORREL.

CAR FROM -30 to 0				
STD.ERR. OF FCST. CUM.	-0.10032	-0.10558	-0.09169	-0.09785
STANDARDIZED CAR	0.14454	0.10485	0.14676	0.10508
SIGNIFICANCE LEVEL	-0.69408	-1.00689	-0.62478	-0.93116
	0.49020	0.31740	0.53520	0.35240
CAR FROM -15 to 0				
STD.ERR. OF FCST. CUM.	-0.04491	-0.04619	-0.04368	-0.04536
STANDARDIZED CAR	0.07014	0.07023	0.07122	0.07038
SIGNIFICANCE LEVEL	-0.64038	-0.65777	-0.61337	-0.64446
	0.52220	0.50920	0.53520	0.52220
CAR 5				
STD.ERR. OF FCST. CUM.	-0.01885	-0.02483	-0.00128	-0.01879
STANDARDIZED CAR	0.04011	0.03997	0.04073	0.04006
SIGNIFICANCE LEVEL	-0.46998	-0.62122	-0.03134	-0.46908
	0.63840	0.53520	0.97600	0.63840

TABLE 4.31A

INDIVIDUAL SALE DATE EVENT

TESTS OF HYPOTHESIS FOR THE SIGNIFICANCE OF ABNORMAL RETURNS

MARKET MODEL ESTIMATION WITH 120 OBSERVATIONS

NAME OF BANK: SERFIN

	OLS MARKET MODEL		SW ADJUSTED MARKET MODEL	
	CONSTANT	BETA	CONSTANT	BETA
BNMX-30	0.00023	1.45664	0.00013	1.76207
IBMV	0.00078	0.97480	-0.00175	1.31931

	BANAMEX-30	IBMV	BANAMEX-30	IBMV
ABNORMAL RETURN ON DAY 0	-0.03837	-0.04229	-0.03594	-0.03703
STD.ERR. WITHOUT ADJUSTMENT	0.02146	0.02577	0.02179	0.02617
STD.ERR."FORECAST" ADJUSTED	0.02158	0.02595	0.02192	0.02635

SINGLE DAY EVENT WINDOW TEST STATISTICS:

A) WITH UNADJUSTED STANDARD ERRORS:

SALEDATE (DAY 0)	-1.78844	-1.64092	-1.64916	-1.41512
SIGNIFICANCE LEVEL	0.07340	0.10100	0.09900	0.15560

B) WITH FORECAST ADJUSTED STANDARD ERRORS:

SALEDATE (DAY 0)	-1.77802	-1.62965	-1.63956	-1.40540
SIGNIFICANCE LEVEL	0.07500	0.10320	0.10100	0.15860

SEVERAL DAYS EVENT WINDOWS TEST STATISTICS , ASSUMING INTERTEMP. CORREL.

CAR FROM -30 to 0				
STD.ERR. OF FCST. CUM.	-0.27710	-0.27423	-0.31206	-0.25319
STANDARDIZED CAR	0.18660	0.15915	0.18955	0.16160
SIGNIFICANCE LEVEL	-1.48500	-1.72308	-1.64636	-1.56677
	0.13620	0.08540	0.09900	0.11640
CAR FROM -15 to 0				
STD.ERR. OF FCST. CUM.	-0.25607	-0.26338	-0.27053	-0.25213
STANDARDIZED CAR	0.08844	0.10629	0.08984	0.10792
SIGNIFICANCE LEVEL	-2.89540	-2.47796	-3.01130	-2.33614
	0.00380	0.01320	0.00260	0.01920
CAR 5				
STD.ERR. OF FCST. CUM.	-0.08437	-0.09329	-0.08467	-0.08420
STANDARDIZED CAR	0.04897	0.05881	0.04974	0.05972
SIGNIFICANCE LEVEL	-1.72316	-1.58621	-1.70223	-1.40992
	0.08540	0.11180	0.08920	0.15860

TABLE 4.32A

INDIVIDUAL SALE DATE EVENT

TESTS OF HYPOTHESIS FOR THE SIGNIFICANCE OF ABNORMAL RETURNS

MARKET MODEL ESTIMATION WITH 120 OBSERVATIONS

NAME OF BANK: SOMEX

	OLS MARKET MODEL		SW ADJUSTED MARKET MODEL	
	CONSTANT	BETA	CONSTANT	BETA
BNMX-30	0.00023	1.45664	0.00726	-0.84596
IBMV	0.00078	0.97480	0.00649	-0.08910

	BANAMEX-30	IBMV	BANAMEX-30	IBMV
ABNORMAL RETURN ON DAY 0	-0.01009	-0.00769	-0.00153	-0.00586
STD.ERR. WITHOUT ADJUSTMENT	0.03972	0.03583	0.03009	0.03022
STD.ERR."FORECAST" ADJUSTED	0.03992	0.03600	0.03024	0.03037

SINGLE DAY EVENT WINDOW TEST STATISTICS:

A) WITH UNADJUSTED STANDARD ERRORS:

SALEDATE (DAY 0)	-0.25397	-0.21460	-0.05096	-0.19390
SIGNIFICANCE LEVEL	0.80260	0.83360	0.96020	0.84940

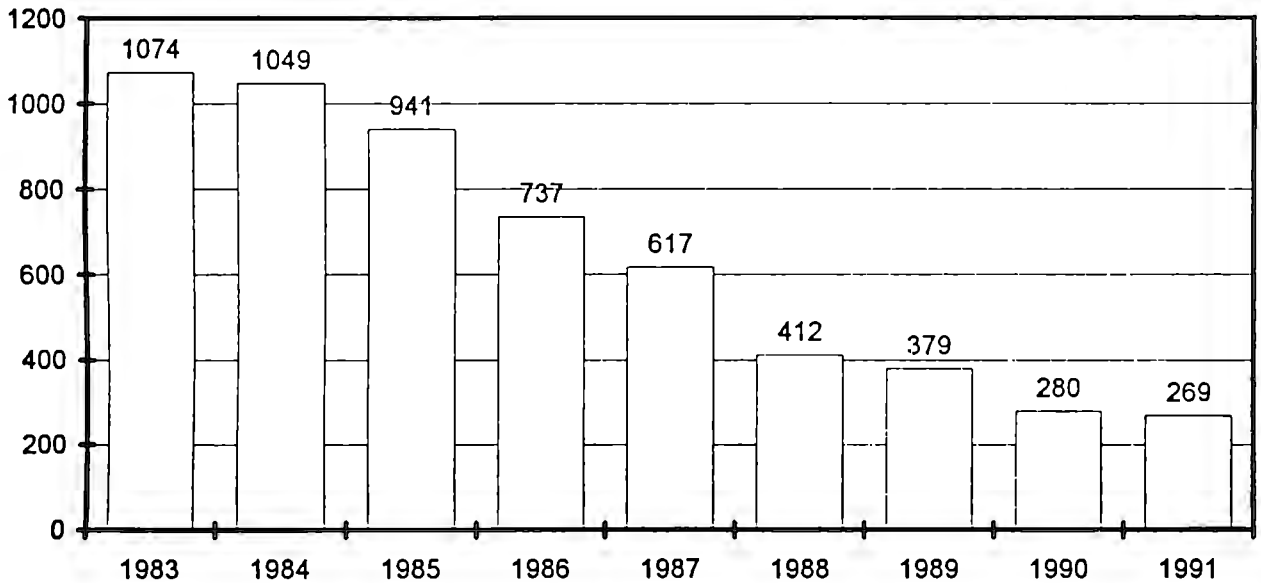
B) WITH FORECAST ADJUSTED STANDARD ERRORS:

SALEDATE (DAY 0)	-0.25274	-0.21359	-0.05071	-0.19298
SIGNIFICANCE LEVEL	0.80260	0.83360	0.96020	0.84940

SEVERAL DAYS EVENT WINDOWS TEST STATISTICS , ASSUMING INTERTEMP. CORREL.

CAR FROM -30 to 0				
STD.ERR. OF FCST. CUM.	-0.46979	-0.47898	-0.41567	-0.47682
STANDARDIZED CAR	0.34218	0.22029	0.25919	0.18580
SIGNIFICANCE LEVEL	-1.37291	-2.17430	-1.60371	-2.56629
	0.17060	0.03000	0.10960	0.01020
CAR FROM -15 to 0				
STD.ERR. OF FCST. CUM.	-0.45807	-0.42405	-0.32604	-0.39191
STANDARDIZED CAR	0.16482	0.14848	0.12485	0.12524
SIGNIFICANCE LEVEL	-2.77920	-2.85587	-2.61150	-3.12937
	0.00540	0.00420	0.00900	0.00180
CAR 5				
STD.ERR. OF FCST. CUM.	-0.02623	-0.03008	0.01547	-0.00438
STANDARDIZED CAR	0.09096	0.08240	0.06890	0.06950
SIGNIFICANCE LEVEL	-0.28840	-0.36503	0.22454	-0.06309
	0.77180	0.71140	0.82580	0.95220

CHART 1.1A : NUMBER OF STATE OWNED FIRMS 1983-1991.



SOURCE: SECRETARIA DE HACIENDA Y CREDITO PUBLICO, MEXICO, 1992.

CHART 3.1A: CUMULATIVE ABNORMAL RETURNS FROM PORTFOLIO 1 AND BANAMEX-30.
PERIOD: -30 TO 0, WITH RESPECT TO MAY 2, 1990.

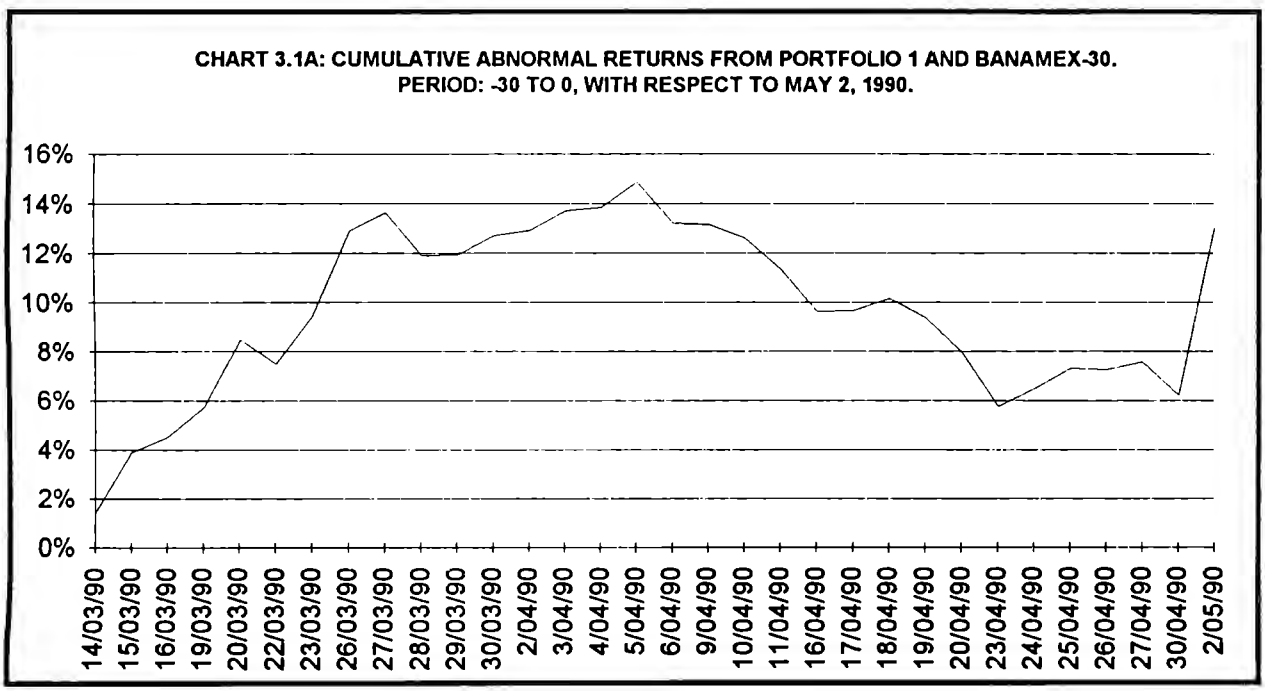


CHART 3.2A: CUMULATIVE ABNORMAL RETURNS FROM PORTFOLIO 1 AND I.B.M.V. PERIOD: -30 TO 0, WITH RESPECT TO MAY 2, 1990.

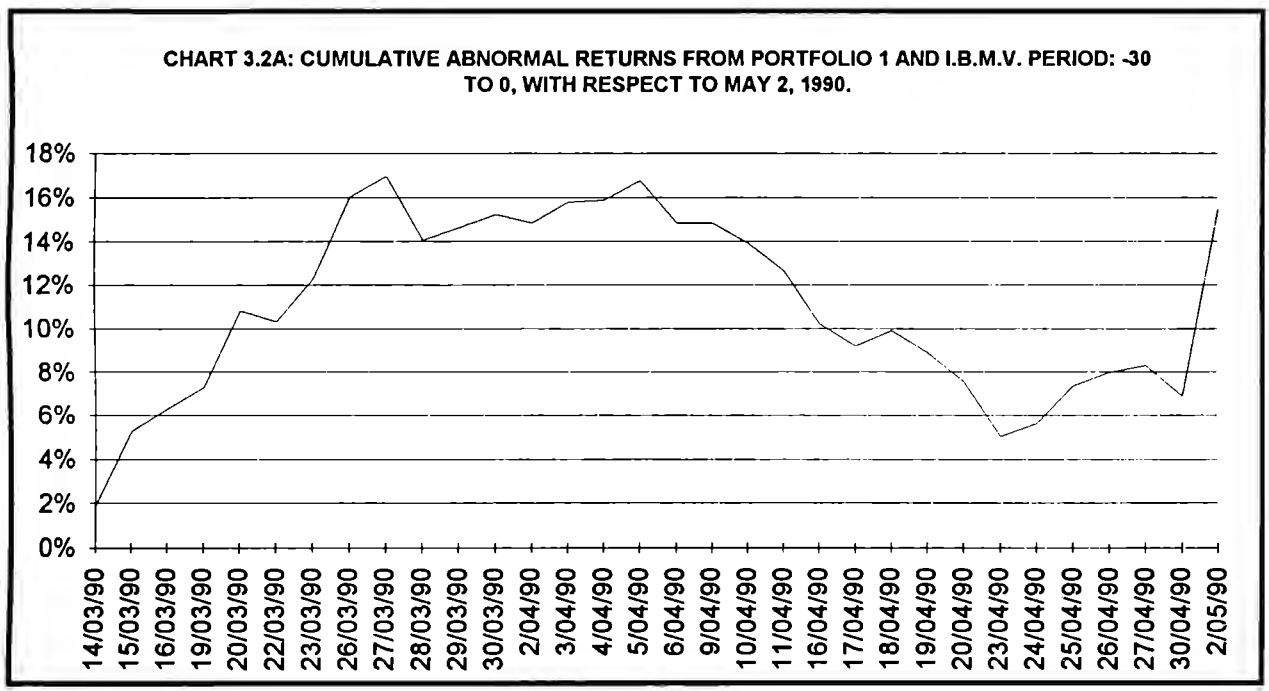


CHART 3.3A: CUMULATIVE ABNORMAL RETURNS FROM PORTFOLIO 2 AND BANAMEX-30.
PERIOD: -30 TO 0, WITH RESPECT TO MAY 2, 1990.

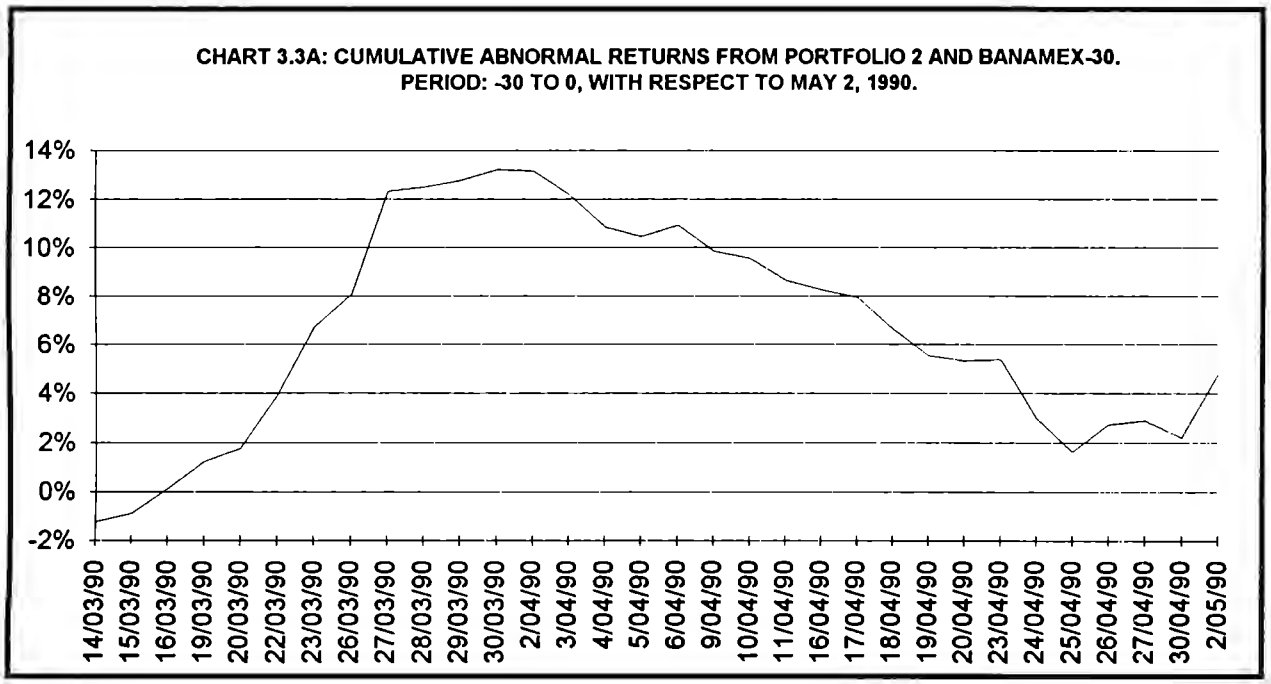


CHART 3.4A: CUMULATIVE ABNORMAL RETURNS FROM PORTFOLIO 2 AND I.B.M.V. PERIOD: -30 TO 0, WITH RESPECT TO MAY 2, 1990.

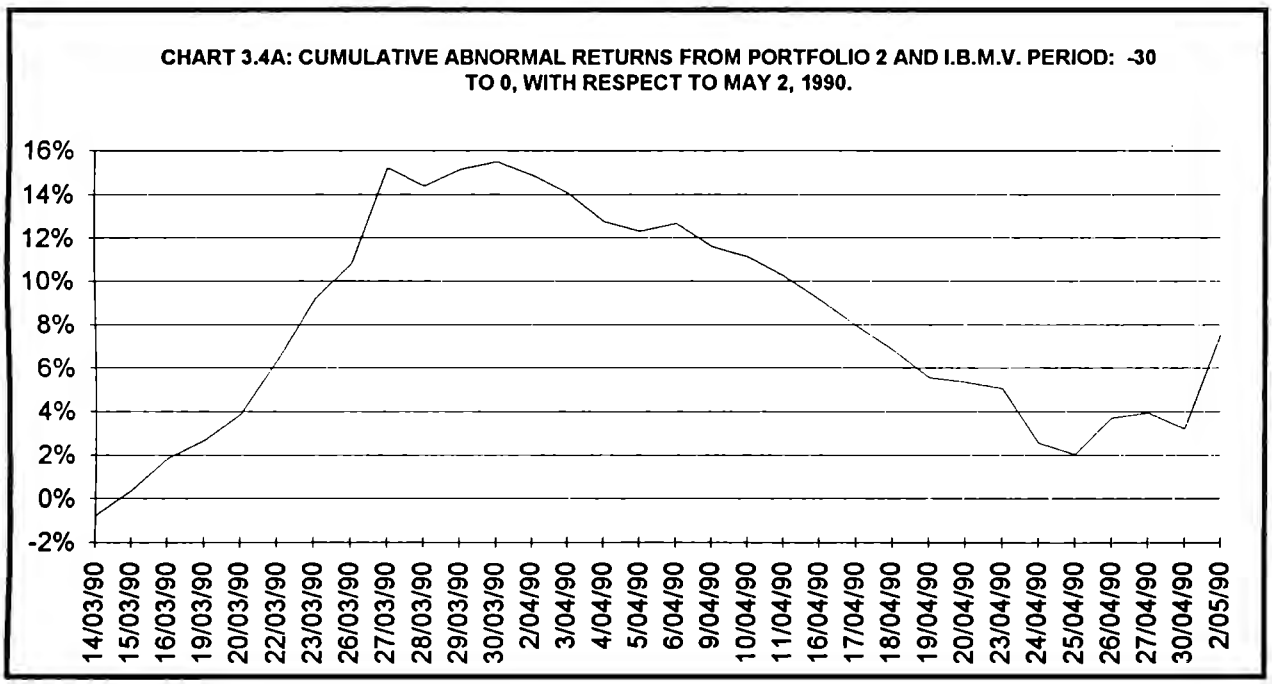


CHART 3.5A: CUMULATIVE ABNORMAL RETURNS FROM PORTFOLIO 3 AND BANAMEX-30.
PERIOD: -30 TO 0, WITH RESPECT TO MAY 2, 1990.

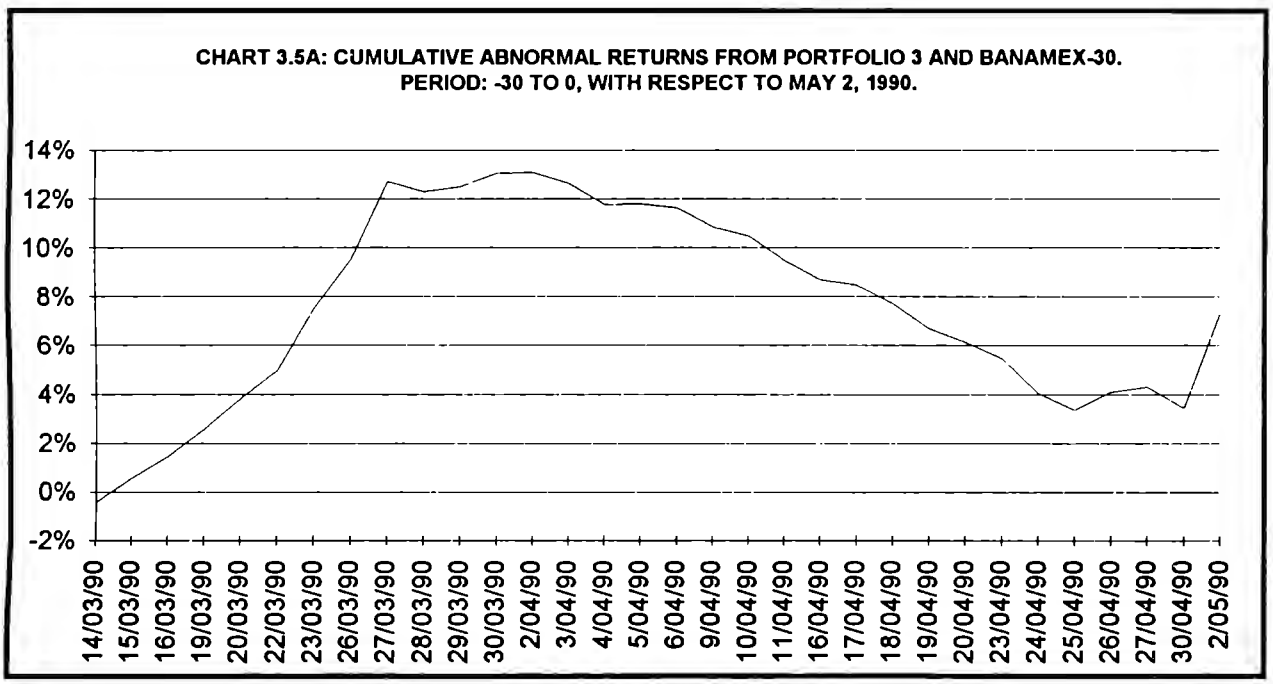


CHART 3.6A: CUMULATIVE ABNORMAL RETURNS FROM PORTFOLIO 3 AND I.B.M.V. PERIOD: -30 TO 0, WITH RESPECT TO MAY 2, 1990.