

University of Bahrain
College of Business Administration
MBA Program

**MARKET EFFICIENCY OF
THE BAHRAIN STOCK EXCHANGE:**
An Empirical Study

By
Nadia Al Sammak

Supervised By
Dr. Batool Assiri

June 1996

GIFT هَدِيَّة



*University of Bahrain
College of Business Administration
MBA Program*



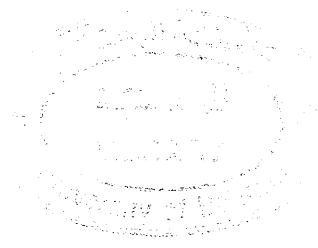
***MARKET EFFICIENCY OF
THE BAHRAIN STOCK EXCHANGE:
An Empirical Study***

*By
Nadia Al Sammak*

*Supervised By
Dr. Batool Assiri*

June 1996

**Market Efficiency Of
The Bahrain Stock Exchange:
An Empirical Study**



Submitted by
Nadia Abdulla Al Sammak

To the University of Bahrain
as a partial fulfillment for
the degree of Masters in Business Administration
in the College of Business Administration

June 1996

I certify that all material in this project which are not my own work
have been identified and that no material is included
for which a degree has previously been conferred upon me

Nadia Abdulla Al Sammak

Project Committee:

Supervisor : _____
Dr. Batool Assiri

Reader : _____
Dr. Saad Mettawa

Reader : _____
Dr. Seref Turen

TABLE OF CONTENTS



Abstract.....	II
---------------	----

Acknowledgment.....	III
---------------------	-----

Chapter One : Introduction.....	1
---------------------------------	---

1.1. Introduction	1
1.2. Purpose of the Study	2
1.3. Statement Of The Problem	2
1.4. Scope Of The Research:	2
1.5. Significance Of The Research	3
1.6. Analytical Methods	5
1.7. Organization Of The Research.....	6
1.8. Limitations	7

Chapter Two : Literature Review	9
---------------------------------------	---

2.1. Introduction	9
2.2. Literature Review.....	10
2.2.1. Fama, Fisher, Jensen and Roall (FFJR (1969)).....	10
2.2.2. Copeland (1984)	13
2.2.3. Grinblatt, Masulis and Tittman (GMT (1984)).....	15
2.2.4. Lakonishok and Lev (L & L (1987)).....	18
2.2.5. Lamoureux and Poon (L & P (1987)).....	21
2.2.6. Liljeblom (1989).....	22
2.2.7. Fama (1991).....	24
2.2.8. Maloney and Mulherin (M & M (1992))	25
2.2.9. Jong, Kemna and Kloek.....	27
2.2.10. Arbel and Swanson (1993)	28
2.2.11. Baker and Powell	29
2.2.12. Doran (1994)	30
2.2.13. Muscarella and Vestupen (1995)	31
2.3 Conclusion	32

Chapter Three : Research Methodology	36
3.1. Introduction	36
3.2. Research Hypothesis	36
3.3. Data Description	37
3.4. Data Analysis Techniques	39
3.5. Summary Of Research Methodology	43
 Chapter 4 : Data Analysis And Findings	 44
4.1. Market Model Parameters	44
4.2. Cross Sectional Residuals Or Excess Returns	48
4.3. The Amiri Decree	55
4.4. Is the Bahrain Stock Exchange Efficient?	56
4.5. Summary	61
 Chapter 5 : Conclusion	 63
5.1. Conclusion	63
5.2. Scope for Further Research	67
 Bibliography.....	 68

Appendix (1)

ABSTRACT

This research is an event study used to test whether the Bahrain Stock Exchange is efficient.

Event Studies represent a good method to test efficiency because they reduce the joint hypothesis problem inherent in any market efficiency test and because the event day can be determined accurately.

The event chosen in this research is that of the stock split announcements that occurred on the Bahrain Stock Exchange in 1991 and 1992. The research studies the behavior of stock splits over a 121 days study period with the announcement day centering this period.

The methodology used is a typical event study methodology first introduced by Fama, Fisher, Jensen and Roll (1969). This method uses the Market Model version of Capital Asset Pricing Model (CAPM) to calculate expected returns which are then subtracted from the actual returns to determine abnormal returns. As we are concerned with whether the process of splitting is associated with some kind of behavior, the simple process of averaging is used rather than the behavior of individual stock prices.

The results obtained in this research are very different from the typical results of the event studies discussed in the literature review part of this research. This is attributed, in my opinion, to the special characteristics of the Bahrain Stock Exchange.

ACKNOWLEDGMENT

My thanks goes to the Great God for blessing me with the completion of this project, my family for my time spent away from them, Dr. Batool Assiri, my project supervisor, for her continuous encouragement and support, Dr. Turen and Dr. Mettawa, my project readers, for their invaluable comments and careful review of this project.

Finally, I would like to extend my thanks to all the people who assisted me with this research, specially to Mr. Ahmed Qassim of KPMG Fakhro and Mr. Ahmed Mattar.

CHAPTER ONE

INTRODUCTION

1.1 INTRODUCTION

The year 1992 in the life of the Bahrain Stock Exchange (BSE) can be called the year of splits. By December 1992, 19 of the 26 listed stocks had split their stocks, followed by two more stocks in 1993. That is, 21 out of the 26 listed companies have split their stocks, comprising a total of 80% of all listed companies.

Every year hundreds of companies worldwide increase the number of shares in issue by subdividing the stock that is already outstanding (Radcliffe (1987)). For a large company, the administrative costs of such action is substantial, yet it does not affect in any other way the company's cash flows or the proportion of these cash flows that is attributable to each shareholder. A stock split is simply an increase in the number of shares which a company has outstanding. Because a split has no effect on the firm's investment or on financial structure, it should also have no effect upon the firm's total market value; individual share prices will decline, of course, but total firm value should remain unchanged, or should it not?

Stock splits represent an appropriate event on which to test the semistrong form of the Efficient Market Hypothesis (EMT), or *event studies*; the announcement of the event can be reasonably determined, and this is because we know what the effect of the announcement should be.

In 1969, Fama, Fisher, Jensen and Roll (FFJR) hypothesized that stock splits themselves provide no new information about the firm. Price movement to levels other than those suggested by the split should be related to more fundamental

information. After this seminal study, there was a boom of *event studies*, many of which reached a conclusion different than that of (FFJR), such as Grinblatt, Masulis and Titman (1984), Liljeblom (1989) and Doran (1994).

1.2 PURPOSE OF THE STUDY

This endeavor is an attempt to test whether the Bahrain Stock Exchange is *efficient* in terms of the speed of price adjustment to public information, i.e., in terms of event studies. It will attempt to show that prices adjust instantaneously to news announcements so that there is no opportunity for speculative profits.

1.3 STATEMENT OF THE PROBLEM

This study is an attempt to answer the following questions:

1. Do stock prices show levels other than those suggested by the split? Do they increase or decrease compared to prior split prices?
2. If prices change to levels other than those suggested by the split, do they change instantaneously? or with a lag, thus allowing for speculative profits?
3. Is the Bahrain Stock Exchange efficient in the sense that prices adjust instantaneously to new information?

1.4 SCOPE OF THE RESEARCH:

The research is limited to companies listed on the Bahrain Stock Exchange that split their shares over the past five years since the establishment of the exchange. Of the 26 listed stocks, 21 stocks had split; however, due to lack of some data for one company, this study will be restricted to 20 out of the 21 splits.

1.5 SIGNIFICANCE OF THE RESEARCH

The Efficient Market Theory (EMT) is one of the fundamental blocks of the theory of finance. In his 1991 article, Fama defines the market efficiency hypothesis to be the simple statement that security prices fully reflect all available information. As there are positive information and trading costs, the costs of getting price to reflect information; Fama defined a weaker and economically more sensible version of the efficiency hypothesis. This version states that prices reflect information to the point where the marginal benefits of acting on information, or the profits to be made, do not exceed marginal costs.

The concept of the efficient market is astonishingly simple and remarkably well supported by the facts. Market efficiency is crucial for any economy because it implies that security prices truly reflect the real underlying value of assets and it implies tough competition. Thus, security prices should provide accurate signals for capital allocations as they assess the future of particular industries and allocate capital as needed. Market efficiency means that investors and sellers trust market prices and that firms or real goods investors will be able to use the money from real savers and invest it where the society needs it, allowing the whole economy to grow.

Work on market efficiency is divided into three categories (Fama (1991)): Tests for return predictability from past returns as well as from other variables is the first category. Next category is event studies which focus on the adjustment of prices to public announcements. Finally, tests for private information which test whether specific investors have information not reflected in market prices is the last category.

The new work on return predictability states that returns are predictable from past returns, from dividend yields and from various term-structure variables (Fama (1991)). Much of the research on market efficiency in Bahrain has concentrated on this area, for example, Al-Jowder (1993). However, this area of market efficiency is most controversial as some argue that time variations in returns are rational (Fama (1991)) and some argue that they are irrational (Black (1986)). Moreover, the joint hypothesis problem is more serious in this area of market efficiency. Fama (1991) argued that the efficient market hypothesis must be tested jointly with some model of equilibrium, namely, an asset pricing model. He stated that “We can test whether information is properly reflected in price only in the context of a pricing model that defines the meaning of “properly”.

As for tests on private information, there is a large body of evidence in the United States that corporate insiders do have private information that is not fully reflected in prices (Jaffe (1974)), Seyhun (1986)). It is logical to assume that a similar conclusion will be drawn here in Bahrain.

Based on the above, I have decided to test market efficiency using event studies because “the cleanest evidence on market-efficiency comes from event studies, especially event studies on daily returns” (Fama (1991)). When the announcement of an event can be dated to a day, daily data allow precise measurement of the speed of the price response. Another useful element of daily data is that they can attenuate the joint-hypothesis problem. That is the case when the stock-price response to an event is large and concentrated within a few days, the way one estimates daily expected returns (normal returns) in calculating abnormal return has little effect on inferences (Brown and Warner (1985)).

1.6 ANALYTICAL METHODS

The research is divided into two steps:

First, price behavior 60 days prior to the announcement of the splits and 60 days after the announcement will be observed.

Second, a standard event methodology is applied as explained in section 3.4. That is, we must control for the market-related part of returns if we are attempting to identify the impact of a firm-unique event. Unadjusted, raw stock returns taken at the date of a split should not be used. Therefore, the "residual term" from the Market Model will be examined. That is:

$$\begin{array}{rclcl} \text{Raw Return} & & \text{Constant Average} & & \text{Return Due} & & \text{Return Due} \\ \text{on Day } t & = & \text{Daily Return} & + & \text{to Market Moves} & + & \text{to Firm News} \\ r_{it} & = & \alpha_i & + & \beta_i r_{mt} & + & e_{it} \end{array}$$

Where r_{it} = the return on stock i on day t ,
 α_i = the constant average return,
 β_i = the beta estimate of the stock,
 r_{mt} = the return on the Bahrain Stock Exchange Index during day t ,
 e_{it} = the residual error or the excess return in day t .

The event methodology was first used by Fama, Fisher, Jensen and Roll (1969) and it captures whatever extraordinary effect a split has in the residual term e_{it} , which is the return in excess of the stock's return due to general market condition.

As we are concerned with whether the process of splitting is in general associated with a specific type of return behavior, we would abstract from the eccentricities of specific cases by looking at the cross-sectional residual of all splits in the study.

That is, an average of all *firm-unique returns* will be found for each day surrounding the split, as follows:

$$\text{Average Market Model Residual on day } t = e_t = \frac{\sum_{i=1}^N e_{it}}{N}$$

Then, a *cumulative average firm-unique return* is found for each day by summing up all average firm-unique returns through a particular day as follows:

$$\text{Cumulative Market Model Residual on day } t = E_t = \sum_{d=-60}^t e_d$$

Both e_t and E_t will be analyzed over the entire 121 day study period to see whether the process of splitting is associated with a certain type of behavior and to see how stock prices respond to split announcements.

1.7 ORGANIZATION OF THE RESEARCH

This study is organized as follows:

Chapter One is an introduction outlining the purpose, significance and limitations of this research. Chapter Two is a review of the related literature on stock splits used as tests of market efficiency. Chapter Three discusses in details the methodology to be used in conducting the research, analytical techniques, as well as data sources. Chapter Four covers the analysis of the research findings and the interpretation of these findings. Chapter Five draws the conclusion of the study and may provide insight into further future research.

1.8 LIMITATIONS

1. Only splits that occurred in 1991 and 1992 will be studied as these are the only splits with available information. It is unknown whether there were splits prior to 1990, the year in which the exchange was established. No splits were documented after 1993. Longer periods with more stock splits would provide better results.
2. Price changes at the time of the split may be due not solely to splits but also to other issues which the Market Model is not able to capture.
3. The sample is small: Only 20 splits are studied; a larger number of splits may yield better results. However, the total number of splits was only 21.
4. Stock splits are usually used to test market efficiency but there are other events that can be used that may provide better results.
5. The BSE is a very inactive market. Some stocks are not traded for many months. This will be translated into 0 daily return when estimating the market model, whereas in reality there was no trading or there was an odd lot trading. In addition, even for stocks which are relatively active, prices do not change frequently. This lack of activity may affect the robustness of the market model as it affects the estimates of α and β . Moreover, transactions lower than BD 1500 do not change market prices, resulting in unchanged price for individual stocks for a quite long period.
6. This study assumes that the Market Model which is derived from Capital Assets Pricing Model (CAPM) is an accurate measure of risk and return. This assumption might not be true, as explained in section 3.4. For Example, Gong, Angelen and Kemnak (1992) provided evidence that

violate the Market Model's assumptions of a normally distributed error term with constant variance, and constant beta (β). However, I have decided to use this model because it is easily understandable and not very restrictive, as explained in section 3.4.

7. The Efficient Market Hypothesis does not imply CAPM. There could be better measures of risk and returns. The Market Model may not capture all the effects of the company-unique information. Thus, if results of the study are not as expected, the anomalous evidence could be due to market effect (inefficiency) or to a poor model of pricing.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

The Efficient Market Hypothesis (EMT) is one of the fundamental blocks of modern finance theory. It is astonishingly simple. EMT states that security prices fully reflect all available information. In his 1970 article, Fama defined three types of market efficiency. One is weak form efficiency, which states that prices follow a random walk so that consecutive changes in prices are uncorrelated; that is, returns cannot be predicted from past returns. Semi-strong form tests are concerned with the adjustment of security prices to one kind of information generating event, e.g. stock splits, new security issues, mergers, etc. Strong form tests are concerned with whether all available information are fully reflected in price in the sense that no individual has a higher than expected trading profit in relation to others because of having monopolistic access to some information.

An efficient capital market is a crucial component of any capitalistic society because security prices provide accurate signals for capital allocation. In an efficient market, investors and firms expect to pay and to receive a fair price. That is, Efficient Market theory means that capital markets and security prices should be trusted and that people should have faith in their economic system.

This study is concerned with the semi-strong form of efficiency, or with event studies according to Fama's (1991) new definition; it tests the speed of adjustment of local stock prices to the event of stock split.

2.2 LITERATURE REVIEW

2.2.1 Fama, Fisher, Jensen and Roll (FFJR (1969))

Fama, Fisher, Jensen and Roll (FFJR (1969)) were the first to do empirical research on the semi-strong form of efficiency. They wanted to test the speed of adjustment of prices to specific kinds of new information in the form of stock splits announcements. The importance of this study stems from three facts. First, it set up the methodology that was then replicated by subsequent studies. Second, it isolated the effect of stock splits on stock returns from the effects of general market conditions- in order to test whatever extraordinary effect a split has. Third, it pointed out the need to remove the influence of cash dividend increases to isolate the real effect of splits on prices.

They examined 940 splits between 1927 and 1959. The extraordinary effect of the splits was captured in the residual term of a regression of stock-specific returns on the market returns. Their study focused on the cross-sectional average of all splits to abstract from eccentricities of individual securities.

2.2.1.1 Unusually high performers

FFJR (1969) found that companies tend to split their shares during a bullish market period and that stocks that are split tend to be particularly those which had performed unusually well during this boom period. Stock splits are usually preceded by a period during which the rates of returns on the security to be split are unusually high. That period of high returns began,

however, long before any information about splits reaches the market, (about 29 months earlier). The cumulative average residual rises dramatically up to the split month but there is no further systematic movement thereafter. The largest positive average residual occurs three to four months prior to the split (around the time of the split announcement).

2.2.1.2 The real cause of price appreciation

FFJR (1969) hypothesized that such returns behavior is not due to the split itself but rather because splits are usually accompanied by an increase in dividends. Thus split announcements reduce investors' uncertainty about the prospect of the company which had been doing well in the past but about whose future investors are still unsure. It is similar to a management message that they are confident about the future of their company. Thus, such behavior of the cumulative residual is due to altering expectations of the market regarding the future earning potential of the firm, rather to any intrinsic effect of the split itself.

This hypothesis was supported by their findings that splits with accompanied dividend increase had slightly positive average residual after the split; however, after one year the average residual resumes its normal relation to the market. The fact that the residual is only slightly positive is due to the fact that dividend increase is usually concurrent with a split announcement or is anticipated even if it is not concurrent. Therefore, only slight adjustment is needed when dividend increase is actually announced. Splits with accompanied decreased dividends provide the strongest evidence

for the FFJR hypothesis that price appreciation is due to the announcement of dividends rather than to the split announcement itself- the reason is that they plummet in the few months after the split when the anticipated dividend increase, if it were coming at all, is not forthcoming. After a year has passed following the split, the cumulative average residual falls to about where it was five months before the split; this is about the earliest time when reliable information concerning a possible split is likely to reach the market.

FFJR (1969) concluded that the market makes unbiased dividends forecasts for split securities and that these forecasts are fully reflected in the prices of the securities by the end of the split month.

2.2.1.3 Stock splits are not an opportunity for generating abnormal returns

FFJR (1969) have also investigated whether the adjustment of prices to stock split announcements is so rapid that it cannot be used to increase trading profits. First, according to FFJR, trading profits cannot be increased by purchasing split securities after the split has become effective, because as it was apparent, returns resume their normal relationship with the market thereafter. Second, they argue that even buying split securities at the formal announcement date of stock splits does not lead to higher trading profits because previous studies (such as Bellemore and Blucher (1956)) have shown that price movements associated with a split are over by the day after the split is announced. Third, when FFJR replicated their study for 52 stocks of their sample but with month 0 as the announcement month

rather than the month in which the split becomes effective, similar results were reached as with those reached when month 0 was the effective split month; therefore, no excess return is possible when buying securities as soon as the split is announced. Finally, the cross-sectional residual was not representative of individual residuals of the securities making up the sample. The individual residuals are more randomly distributed about 0. FFJR concluded that the stock market is indeed *efficient* and that prices adjust rapidly and quickly to new information.

2.2.2 Copeland (1984)

Copeland (1984) questioned the traditional justifications for stock splits, namely, the increase in stock holders' wealth and improvement in liquidity.

2.2.2.1 Increasing shareholders' wealth

Copeland stated that the increase in stockholders' wealth as a result of the increase in stock prices after stock splits have no basis in fact. He argued that prices of split securities go up presumably because they had specially good earnings before the split. Thus, the underlying cause of this appreciation is this strong earning performance rather than the anticipation of the split. Thus, the fact that we selected split-up securities-after the fact-virtually guarantees that we will find higher than average returns before the split. In other words, this pre-split price appreciation suggests that management decided on stock split because its stock price, having gone up, was perceived to be "too high." Thus, the underlying cause for this

appreciation was probably strong earnings performance rather than the anticipation of the split. Moreover, he cited the well-known FFJR (1969) study that found no abnormal performance in the prices of split stocks either on the split announcement date or over the 2-1/2 years following the announcement.

2.2.2.2 Improving Liquidity

As to improving liquidity, there is a myth that perpetuates Wall Street that there is an optimal trading range for stock prices that enhance the “marketability” or improve “liquidity” of a company stock. This optimal trading range broadens the shareholders base and balances the interests of institutions and wealthy individuals on the one hand and small investors on the other. Copeland tried to investigate this issue by examining three different aspects of liquidity: The effect of splits on “relative trading volume”, the effect on “total brokerage revenue” by a round lot investor, and the effect on “bid-ask spreads” on a sample of OTC firms.

Examining random sample of 25 splits which occurred between 1963 and 1973, Copeland found that total “trading volume” contracted by 20% after a split. Moreover, he found that “brokerage fees” were actually increased as in most brokerage firms, with round lot commission being based on the number of shares involved in a trade as well as on the dollar amount of the trade. As to the effect of split on “bid-ask spread”, Copeland analyzed this effect for 162 OTC splits between 1968 and 1976 and found that the bid-ask spread calculated as a percentage of the value traded, increases

dramatically after the split and stays up higher for at least 40 days after the split. Therefore, Copeland concluded that liquidity is actually lower following stock splits.

2.2.3 Grinblatt, Masulis and Titman (GMT (1984))

Grinblatt, Masulis and Titman (GMT (1984)) discussed some theories on why firms choose to split their shares and examined the impact of stock splits and stock dividends announcements. They offered the following hypotheses as a rationale for splits:

2.2.3.1 The Signalling Hypothesis

The Signalling Hypothesis states that there is asymmetric information between managers and investors, managers have incentive to convey favorable information to the investors, and that there is cost to mimic the financial decisions of high-value firms by low-value firms. As there are no apparent costs to stock splits, they should have no information content and therefore the signaling hypothesis may not be correct. However, “the retained earnings hypothesis” which is consistent with the signaling hypothesis may be correct in the case of stock dividends. For stock dividends, the value of the newly distributed shares is subtracted from retained earnings and is added to the firm’s capital account. If a firm faces legal restriction, stock exchange rules, or has bond covenants written in terms of retained earnings, the additional shares can further reduce the firm’s ability to pay cash dividends. Firms that anticipate increased earnings

will not expect these restrictions to be binding and thus will not find it costly to reduce retained earnings.

2.2.3.2 The Trading Range Hypothesis

The Trading Range Hypothesis states that managers split their shares to keep the prices within a customary trading range. It follows that given the costs associated with splits and reversal, managers with unfavorable inside information might decide not to split even if the firm's stock price is high. Because they expect that future events will force the price of the split share to fall below the customary trading range. One drawback of this hypothesis is that managers might have little concern about the trading range of their firm's stock and split simply to obtain a temporary increase in price. Given the fact that false signaling may predominate splitting firms, the market may attach only a trivial price impact to the announcement of split.

2.2.3.3 The Attention Directing Hypothesis

The Attention Directing Hypothesis states that splits call attention to the firm, thereby triggering market analysts' reassessment of the firm's future cash flows. While underpriced firms find such reassessment in their interest, overpriced firms do not. One drawback of this theory is that it does not explain why firms use stock dividends and splits to convey information rather than using straightforward press releases.

2.2.3.4 Stock Splits have a Real Impact

GMT pointed out the limitations of FFJR's study in that it does not control for contamination of data resulting from other information releases. Furthermore, the problem of contamination was compounded by the use of monthly returns which were likely to include the valuation effects of other announcements that occurred in the same month.

Using 1762 stock splits and stock dividend announcement events between the years 1967 and 1976 that included a subsample of pure events not accompanied by any other announcements in the three-day period around the announcement day, GMT concluded that there is a positive announcement return for the entire sample, for the sample of "pure events," and for the sample where no cash dividends were declared in the previous three years.

GMT concluded that there is a valuation effect for "pure" splits and for stock dividend distribution and that this valuation effect, for the most part, cannot be explained by forecasts of a near term increase in cash dividends. GMT argued that the announcement effect was not driven by implicit messages or by private communication about cash dividend policy but rather is due to the split itself. He presented the following evidence as support for his argument. First, the pure events have larger announcement effect than the total sample. Second, there was also a positive announcement effect for the pure sample where prior cash dividends were paid and where subsequent dividends were not increased. Finally, there was an announcement return for the subsample of events where the only

contaminating announcement is one of no cash dividend change per unsplit share and this announcement return was also larger than the return of the total sample.

Therefore, GMT disagree with FFJR's conjecture that the announcement effect is tied to increased cash dividends, concluding that some of the informational impact of announcements of splits and stock dividends is not dividends related.

2.2.3.5 The underlying theory for splits

Finally, GMT made a cross-sectional analysis of the announcement returns and presented (cautious) evidence consistent with "The Trading Range Hypothesis" and "The Attention Directing Hypothesis". GMT also found abnormal returns around the ex-dates and offered the justification that it is costly to buy split shares before the ex-day except for the specialists.

2.2.4 Lakonishok and Lev (L& L (1987))

L & L investigated the question of why substantial number of firms still continue to split their stocks or distribute stock dividends when there are real costs involved in such process. L & L investigated 1015 stock splits and 1257 stock dividend cases between 1963 and 1982. They compared these events to a control sample they constructed, in which every company that had a stock split or a stock dividend announcement was matched with a company from the same Standard Industrial Classification with an asset size as close as possible to the test company. L & L tested for two hypotheses

that are often given as justifications for stock splits: The Signaling Hypothesis and The Optimal Price Range Hypothesis.

The Signalling Hypothesis states that management might use financial decisions such stock splits to convey favorable information to their investors. The Optimal Price Range Theory states that stock splits are intended to keep the prices of shares within some optimal range. This range equilibrates the preferences of wealthy investors and institutions on the one hand and small investors on the other hand since managers are interested in a broad and heterogeneous stockholders' base or in "wider marketability."

2.2.4.1 High performers Again

L & L found results similar to those found by FFJR: that splitting firms enjoyed an unusually favorable earnings performance during the pre-split period relative to comparable nonsplitting firms. The above normal earnings for the splitting firms persisted up to the first post-split year although it was much smaller than the pre-split growth. The dividend growth followed a similar pattern as the earnings growth but to a lesser degree. The dividend growth for the first quarter after the split was much larger than that of non-splitting firms.

2.2.4.2 Managerial signal

Stock splits may be a management's signal according to L & L because despite the firm's high performance in the pre-split period, the presplit expectations reflect some misgiving as the market is afraid that there might

be a reversal of fortunes. By splitting its shares, management is sending a reassurance signal that earnings will stabilize at the newly-reached plateau and this may be interpreted as mildly good news. Therefore, stock splits may be a signal to either stabilization of earnings growth subsequent to the abnormal pre-split growth, to improved cash dividends, or to both.

2.2.4.3 Back to normal

L & L also found support for The Optimal Price Hypothesis. They found that firms which split their stocks and firms which do not show a price gap from about four years before the split, widening until it reaches 70% on the split date. After the split, the difference between firms that split their shares and those that do not narrows and vanishes altogether in the fourth month after the split announcement. L & L offered the conclusion that by splitting their firm's stock, managers were in unbiased manner adjusting their stock price to the average price of regular firms.

2.2.4.4 Mixed evidence for marketability

L & L found mixed evidence for increased marketability after splits. They found that the trading volume increases during the twelve months before the split and it peaks at the split month; however, it stabilizes two months after the split. The difference in trading volumes between splitting firms and non-splitting firms vanishes altogether by the second month following the split announcement. Thus stock splits do not appear to exert permanent effect on the volume of trade.

2.2.5 Lamoureux and Poon (L & P (1987))

L & P confirmed GMT findings that the market reacts favorably to stock splits both on the announcement day and on the ex-day even in the case of “clean splits” that are not contaminated by any other firm-specific news. The source of the positive return on the announcement day is due to market valuation of the split share while the source of the positive return on the ex-day is due to price pressure.

2.2.5.1 The Tax-Option Model

L & P explain the positive abnormal return which occurs on the announcement day of large splits in the context of Constantinides (1984) “Tax- Option Model”. L & P argue that the reason for the positive stock return on the announcement day despite increased volatility (Ohlson & Penman (1985)) and decreased liquidity (Copeland (1979)) is caused by an increase in the diversifiable risk of the split stock. Volatility of the split share increases due to increase in the raw volume (not split-adjusted) of the daily traded shares as a result of the lower price, of the increase in the number of shareholders, and of the increase in the number of daily transactions; despite the fact that the value of shares traded do not increase. That portion of the increase in diversifiable volatility is desirable according to L & P, particularly to investors in high tax brackets. The US tax code gives preferential treatment to long-term capital gains, and short-term capital losses may be used to offset short-term gains. Thus, this tax advantage is valued by the market which attach a price to it (announcement

return). The expected rate of return is expected to drop as the tax option compensates for it. Thus, L & P's justification for the announcement return contradicts the CAPM and APT asset pricing theories which do not provide for any return for the diversifiable risk. The US tax code was changed in 1986 so that dividends and capital gains are taxed at the same rate. This weakens L & P's argument.

2.2.5.2 Ex-day Return

The source of the ex-day return is due to price pressure, as according to L & P, because a one-time shift in clientele occurs on that day when both exempted institutions- who would not be willing to trade off lower expected returns for the tax option and high tax bracket individuals- trade on that day.

L & P expect that this market reaction to splits would disappear after the change in the US tax code.

2.2.6 Liljeblom (1989)

Liljeblom (1989) tested for informational impact of announcements of stock splits and stock dividends. Liljeblom argues that stock splits and stock dividends themselves convey positive information and that this information is interpreted independently of other simultaneously published new information.

2.2.6.1 Other ways to control for contaminated data

Liljeblom argued that using pure stock split announcements that are not contaminated by any other news releases, such as dividends, substantially reduces the data available to investigate. Instead therefore, Liljeblom proposed to control for the bias associated with contaminated announcements by effective use of all data available. To do this, she used a control group of otherwise similar firms but which did not split or distribute stock dividends. A cross-sectional regression is then performed in order to trace the partial effect of the different announcements on stock prices.

2.2.6.2 Stock splits in themselves convey positive information

Liljeblom Investigated 84 stock split announcements that occurred on the Stockholm Stock Exchange between 1977 and 1985 and two control groups of 84, each of similar firms who declared proxy statement but did not split their stocks. She concluded that there is a significant positive price reaction in the case of stock dividend and stock split announcements that cannot be attributed to contemporaneous information disclosure of EPS or dividends.

The control groups showed a five-day continuous, but mostly insignificant, price decline. The decline might be interpreted as a sign of a market's disappointment caused by the company failing to signal positive expected cash flows in a situation when the market has speculated on a signal and partly discounted its effect in the stock price prior to the proxy statement disclosure.

2.2.6.3 Corroborative effect

Liljeblom presented evidence that the unexpected EPS change as well as the stock dividend/stock split announcement are the most important reasons for significant price reactions following the announcement. Evidence of corroborative effect was also obtained, since a combination of a stock split and unexpected change in EPS seemed to be the most important variable explaining cross-sectional differences of price reactions on the announcement day.

2.2.7 Fama (1991)

Fama (1991) wrote a sequel to his 1970's article in which he reviewed the work on market efficiency over the succeeding 20 years. Fama, redefined the three categories of market efficiency. "At a risk of damning a good thing," he renamed tests for semi-strong and strong forms of market efficiency to be "event studies tests" and "tests for private information," respectively; the coverage of these tests remained unchanged .

For the weak form, he changed the title as well as the coverage. The title was changed to "tests for return predictability" and it now covers not only the previous area of predicting future return from past returns, but it also involves predicting returns from such variables as dividend yields, E/P ratios and various term structure variables.

Fama pointed out that most event studies results are supportive of market efficiency, that prices adjust rapidly to new information and that event studies had become a boom industry due to advancement of computers.

According to Fama, “event studies” research documents interesting regularities in the response of stock prices to investment decisions, to financing decisions and to changes in corporate control. Furthermore, the results stand up to replication and these regularities are the impetus for the theoretical work to explain them. “The typical result in event studies on daily data is that, on average, stock prices seem to adjust within a day to an event announcement. The result is so common that this work now devotes little space to market efficiency. The fact that quick adjustment is consistent with efficiency is noted.”

Fama concluded that, with respect of firm-specific events, the adjustment of stock prices to new information is efficient.

2.2.8 Maloney and Mulherin (M & M (1992))

M & M studied 446 NASDAQ stock splits between January 1, 1984 and December 31, 1990. NASDAQ firms were chosen because any liquidity effect associated with stock splits would be more apparent for NASDAQ firms rather than the larger more actively traded NYSE firms.

2.2.8.1 Good Performers Again

M & M reached a conclusion similar to that of FFJR, that stock splits occur after price run-up and then retain their former relation to the market after the split. This is consistent with the adage that the purpose of splits is to return stock prices to their prior levels following a run of strong performance. Stock returns around the announcement day were significantly

positive and this hold true even for firms that have not experienced a dividends increase prior to, or within one year of, the split.

2.2.8.2 Absolute vs. Relative Spread

M & M found that the absolute spread (dollar) follows the same pattern as the price run-up while the relative spread (divided by the price) shows a reverse pattern. They stated that such behavior, in terms of relative spread, is due to increase in price (the denominator). Therefore, they concluded that the spread actually declines and hence liquidity may improve after splits.

2.2.8.3 The Ex-day return

M & M also found positive stock returns but of a smaller magnitude and in a more discrete fashion around the execution dates of splits. M & M presented evidence that support their argument that this positive return on the ex-day arises from a microstructure phenomena. The return arises from an above-average number of closing prices recorded at the “ask” on the execution date and the days following. The preponderance of ask prices stems from a temporary order imbalance as stock splits accomplish their intended purpose, that is, increasing the number of shareholders of the splitting firms.

The authors computed event returns for the ex-day from bid and ask quotes instead of the closing transaction prices and found asymmetry of the bid and ask quotes around the execution dates. The “ask quote” jumps 2% while the “bid quote” jumps only 0.6% and the difference on the 3 day event is

1.1%. M & M concluded that transaction-induced movement in the bid and ask quotes is therefore not a profit opportunity for the average trader.

M & M also found a marked increase in the number of trades per day after the split. The number of shareholders also increases as well as the institutional shareholders; the percentage of shares held by institutions increases substantially.

M & M related the order imbalance on the ex-day to the expanded shareholder base in as much as splits allow small investors to diversify out a portion of the wealth they hold in the security without completely divesting- as they actually benefit from the reduction in bid-ask spread or transaction costs. The source of the ex-day pressure can be attributed to new investors, principally institutions who buy the stock on the ex-day; this creates buying pressure that drives the ask price up. So the split actually benefits the preexisting small shareholders.

2.2.9 Jong, Kemna and Klock (JAK(1992))

Jong, Kemna and Klock pointed out the shortcomings of the market model which is used by most event studies. The model assumes that the error term (e_t), and hence the returns, follow a normal distribution with constant variance. JAK presented evidence that violates these assumptions of the market model. Furthermore, they rejected the assumption of constant Beta (β) for individual stocks. They therefore proposed a modification to the market model that would capture the deviation from normality and allow for time- dependent beta-an extended market model.

They compared the results obtained from applying the extended market model with those from applying the simple market model and concluded that ignoring the violations of the simple market model's assumptions can lead to spurious results and recommended that future works give attention to their conclusion.

2.2.10 Arbel and Swanson (1993)

Arbel and Swanson (1993) investigated the role of information in stock split announcement effects by examining stock split announcements across a range of stocks differing in terms of information richness. They used a sample of 105 pure split announcements for stocks listed in the NYSE, AMEX and OTC stocks. OTC stocks were included because they tend to be information-poor stock, relative to exchange-listed stocks.

Arbel and Swanson tested for three hypotheses:

1. The degree of market anticipation is related directly to the stock information environment, with greater anticipation for stock about which there is more information.
2. The magnitude of the two-day split effect at the time of the announcement (event days 0, +1) is greater for information poor stocks than for information-rich stocks.
3. The market adjusts rapidly and completely to the split announcement for information-rich stocks but not for information-poor stocks.

Using standard event study methodology, Arbel & Swanson found supportive evidence for their hypotheses that the degree of market anticipation is related directly to the stock information environment with greater anticipation for stocks about which there is more information.

They also found support for the hypothesis that the market adjusts rapidly and completely to stock split announcements during the post announcement period for information-rich stock but not for information-poor stocks. The 40-day post announcement benchmark is positive and substantial for information-poor stock but negative for information-rich stocks.

Mixed evidence was found for the second hypothesis that information-poor stocks have a higher return on event days 0 and 1 than information-rich stocks; this may be due to the fact that few investors are aware of such firms so that full market reaction to the announcement may take time.

2.2.11 Baker and Powell (B & P (1993))

Using a different approach, Baker and Powell (B & P (1993)) surveyed Chief Financial Officers (CFOs) of 136 NYSE and AMEX firms which underwent stock splits between 1988 and 1990. While other researchers make inferences about managers' motives for stock splits from market data, this study pointed out that the main motive for splits is moving the stock prices into a better trading range followed by increased liquidity. The optimum trading range differs significantly between firms with small ($< 2\text{-for-}1$) versus larger ($\geq 2\text{-for-}1$) stock splits.

Increased liquidity is the next most popular motive for these CFOs. Previous research has shown a decrease in liquidity when relative trading volume or relative bid-ask spread were used as measures for liquidity. In contrast, the managers in this survey view liquidity to be the ease of selling stocks with little change in prices. Empirical results have shown that the number of shareholders actually increase after splits, thus supporting the managers' intuitions.

The third motive, but one used to a much lesser extent, is that of signaling optimistic information about the future prospect of the firm. Finally, few CFOs pointed out maximizing shareholders wealth as a motive.

2.2.12 Doran (1994)

According to Doran (1994) stock split announcements are associated with two hypotheses: earnings signaling and attention directing. These hypotheses were discussed under 2.2.3.2 and 2.2.3.3.

Using 164 NYSE & AMEX noncontaminated stock split announcements (pure) that occurred between November 1971 and December 1982, Doran tested for the following hypotheses:

1. There is a favorable market response to stock split announcements.
2. Announcing firms generally experience favorable permanent earnings performance relative to pre-event analyst forecast.
3. Security analysts revise their earnings forecasts generally upward for firms that announce stock splits.

4. There is a positive relationship between future earnings performance of stock splits on the part of announcing firms, on the one hand, and security analyst earning forecast revisions, on the other.

Doran (1994) tested all the above hypotheses and all were confirmed, which supports both the Earning Signaling Hypothesis and the Attention Directing Hypothesis. He provided evidence that security analysts do not depend on the market reaction on the announcement date to revise their forecasts. In addition, he found that the market reacts naively as it reacts very quickly to the announcement based on historical data.

Doran contributed to the literature by showing evidence that information provided by stock split announcements are of a permanent nature.

2.2.13 Muscarella and Vetsuypens (1995)

In an attempt to determine whether the Signaling theory or Price Range (Liquidity) theory is the reason for the announcement effect, a recent article in the "Economist" published the work of two financial economists, Muscarella and Vetsuypens (1995). Muscarella and Vetsuypens examined the performance of American Depositary Receipts (ADRs). These are securities issued to American investors by American banks, and are backed by the underlying shares of foreign firms. In many case, these firms choose to split their ADR shares without splitting their underlying stock.

Because these splits affect only the American market, and not the company's primary market, there should not be any signaling message.

However, the price of ADRs rises anyway after a stock split. Muscarella and Vetsuypens concluded that this positive market reaction must result from improved liquidity. However, this evidence is never conclusive as it can also be argued that the managers will not split their shares lowering their prices unless they expect the price to keep rising, and this involves a bit of signaling theory.

2.3 CONCLUSION

Most of the previous research have documented positive price reaction to the announcements of stock splits. Earlier literature attributed such price reaction to a more fundamental reason relating to dividend announcements rather than the split itself (FFJR (1969)). According to Grinblatt et al (1984), FFJR (1969) were somewhat aggressive in interpreting their empirical results that there is no direct evidence that dividends or splits convey real information. Grinblatt et al have enriched the literature on stock splits by providing evidence that there is indeed an announcement effect on the returns of the stock that is not dividends-related. Subsequent studies such as Lamoureux and Poon (1987), Liljeblom (1989), Arbel and Swanson (1993) and Doran (1994) confirmed GMT findings that there is indeed a positive announcement return and that this valuation effect for the most part cannot be explained by forecasts of near-term increase in cash dividends. These studies have proven that the announcement effect was not driven by implicit messages or by private communication about cash dividends but rather by the informational impact of splits and by stock dividend announcements themselves.

That is, some of the informational impact of splits is not dividend-related and the announcement effect is not completely tied to cash dividend increase as has been conjectured by previous researchers.

These findings make the reactions to split announcements even more mysterious. Stock splits, unlike most cash dividends and capital structure changes, do not directly affect the future cash flows of the firms (GMT (1984)). These changes are no more than “cosmetic” accounting changes with no direct cost or benefits (L & P (1987)). The relative strength of the various interested parties (e.g., shareholders, bondholders, managers, etc.) remains unchanged after splits.

Therefore stock splits have presented finance theorists with a conundrum (L & P (1987)); on the one hand, they are merely costly paper shuffling exercises that cannot affect the value of the firm. On the other hand, there is an immediate and significant price increase upon the announcement of an impending stock split.

Several theories were offered for the announcement effect including Trading Range (Lamoureux and Poon); Increased Marketability (Lakonishok and Lev, Baker and Powell); Attention Directing (Doran); Signaling (Lakonishok and Lev); and Tax Option (Lamoureux & Poon). Researchers provided evidence supporting these theories. Optimal Trading Range was well supported but Signaling was not supported by GMT. Mixed results were obtained for Liquidity Theory depending on the measure of liquidity used: relative volume versus actual volume, absolute spread versus relative spread, or transaction costs, etc. However, many studies reported an increase in the number of shareholders after the split (Lamoureux and Poon, Lakonishok and Lev, and Maloney and Mulherin).

As to market efficiency, most of the literature (FFJR (1969), GMT (1984), Liljeblom (1989) provided evidence that there is a significant and positive return on the announcement day and that prices quickly adjust to new information so that there is no chance for arbitrage profits. The studies discussed, however, did not address whether the trading profit for the average trader on the two announcement days is enough to cover transaction costs as they were mainly concerned with the securities response to the announcements. However, various studies have shown that there is no profit opportunity for the average trader at least on the ex-day (Maloney and Mulherin (1992)). Most studies (Liljeblom (1989), Arbel and Swanson (1993)) have proved rapid adjustment of prices to the announcement and hence market efficiency, but Doran (1994) finds that the market reacts naively as it reacts very quickly to the announcement based on historical data, and he provided evidence that security analysts do not depend on the market reaction on the announcement day to revise their forecasts.

I personally agree with the Optimal Trading Range as a theory for underlying stock splits, as this theory was not rejected by any of the researchers discussed and it is easily understandable. Prices need to go back to their normal trading range. Moreover, the Baker and Powell survey supports this conjecture since the managers in their survey stated that restoring stock prices to their normal trading range is their first motive for undertaking stock splits.

Stock split events are good opportunities to test for market efficiency because they can be traced correctly. The positive announcement return in my opinion may be due to the same justification given by FFJR (1969) and L & L (1987) that there are some misgivings in the market or a fear that there might be a reversal of fortunes.

By splitting their shares, the management is sending a reassurance signal that earnings will stabilize at the newly reached plateau and this may be interpreted as mildly good news.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter describes the methodology used in conducting this study. The chapter includes research hypothesis, data collection methods, characteristics of the sample, and analysis techniques. The methodology that will be used in this study is a typical event study methodology introduced by FFJR (1969). Day 0 is defined as the day in which the intended split was announced; thus day 0 is not the same chronological date for all securities. Day 1 is then defined as the day immediately following the split announcement while day -1 is the day preceding, etc. In this study as in any typical event study, I do not attempt to determine the effects of splits for individual companies. Rather, what concerns me is whether the process of splitting is in general associated with specific types of return behavior and how prices in general react to new public announcements. To abstract from the eccentricities of specific cases, I can rely on the simple process of averaging. Therefore, I will be concentrating on the behavior of cross-sectional averages of estimated regression residuals in the days surrounding the split.

3.2 RESEARCH HYPOTHESIS

This present endeavor is an attempt to test the hypothesis that stock prices of the Bahrain Stock Exchange (BSE) stocks adjust instantaneously to specific kinds of new information, in this case to stock splits, and therefore that the Bahrain Stock Exchange is *efficient*.

I have chosen “event studies” to test for efficiency. Event studies give the most direct evidence on efficiency because they come closest to allowing a break between market efficiency and equilibrium pricing issues (Fama (1991)). The joint-hypothesis problem will be attenuated in the case of events studies.

Although event studies must be also tested with some asset-pricing model, daily data can attenuate the joint hypothesis problem; when stock prices respond to an event and the response is large and concentrated within a few days, the model used to calculate abnormal return has little effect on inferences (Brown and Warner (1985)).

Tests for return predictability and tests for private information versions of market efficiency must be tested jointly with some model of equilibrium - an asset-pricing model. Moreover, since the extreme version of the market efficiency hypothesis is surely false-as information and trading costs are positive, the next best thing is event studies “which give the most direct evidence of efficiency,” according to Fama (1991).

3.3 DATA DESCRIPTION

The research sample will consist of all stocks that split their shares during the period 01 January 1990 to 30 September 1995. All splits on the BSE were announced in 1991 and 1992. The stocks that have split their shares are:

1. National Bank of Bahrain
2. Bank of Bahrain and Kuwait
3. Al Ahli Commercial Bank
4. Bahrain Islamic Bank

5. Bahraini Saudi Bank
6. Bahrain Insurance Co.
7. Bahrain & Kuwait Insurance Co.
8. Al Ahlia Insurance Co.
9. Bahrain Ship Repairing and Engineering Co.
10. Bahrain Cinema Co.
11. National Import & Export Co.
12. General Trading and Food Processing Co.
13. Bahrain Maritime & Mercantile Co.
14. Bahrain Telecommunication Co.
15. Bahrain Car Park Co.
16. Bahrain Flour Mills Co.
17. Bahrain Light Industries Co.
18. Delmon Poultry Co.
19. Bahrain Hotels Co.
20. National Hotels Co.
21. Bahrain Tourism Co.

As the announcement date for National Hotels Co. could not be traced, the research does not include this company and is limited to the 20 remaining companies.

Daily closing prices were used in this study to calculate stock returns. The prices were published by “*Bahrain Stock Exchange Market Indicators & Quotation Spreads.*”

Announcement dates were obtained from *KPMG Fakhro*, who is the auditor for most companies in Bahrain. *KPMG Fakhro* provided the dates of the Annual

General Meetings (AGMs) that approved the intended stock split decision. These AGMs represent the first time the company publicly announced its intention to split their shares. This study differs from other event studies such as Liljeblom (1989) and Arbel and Swanson (1993) in the fact that day 0 is the day immediately following the public announcement date and not the actual announcement date itself; this is because AGMs are typically held in the afternoon when the Stock Market is closed. The announcements were then published in the local news papers on the following day. Therefore, day 0 is the first trading day after the first announcement and is the day when the announcement of the split is published in the local newspapers.

3.4 DATA ANALYSIS TECHNIQUES

Microsoft Excel and SPSS (Statistical Packages for Social Science) software are utilized to perform different statistical measurements and techniques in order to test the hypothesis of the research. Market efficiency per se is not testable as it must be tested jointly with some model of equilibrium-an asset-pricing model that defines how information is “properly” reflected in stock prices.

In this study, a version of the Capital Assets Pricing Model-the Market Model, is used to calculate event-time abnormal returns. The Market Model is used because first, CAPM parameters are very macro, market return is not just the return on the stock market but it should be the return on all assets in the market, including for example real estates. Moreover, risk-free return is not so easily obtainable in an environment like that of Bahrain.

Second, most of the event studies reviewed in Chapter 2 either used the Market Model in their analysis or used the Mean Adjusted Return. No single study has used the CAPM to estimate abnormal return.

Third, as Fama (1991) puts it: “Highly constrained asset-pricing models like the SLB model are surely false. They have systematic problems explaining the cross-section of expected returns that can look like market inefficiencies. In market-efficiency tests, one should avoid models that put a strong restriction on the cross-section of expected returns, if that is consistent with the purpose at hand. Concretely, one should use formal asset-pricing models when the phenomenon studied concerns the cross-section of expected returns (e.g., tests on firm size, leverage, and E/P effects). But when the phenomenon is firm-specific (as with most event studies), one can use firm-specific “models” like the market model or historical average returns, to abstract from normal expected returns without putting unnecessary constraints on the cross-section of expected returns.” The SLB model is Sharpe, Lintner, Black and it is the CAPM model.

The Market Model is defined as follows:

$$r_{it} = \alpha_i + \beta_i r_{mt} + e_{it} \quad (1)$$

where r_{it} = the return on security i during day t

α_i = time-invariant intercept

β_i = slope estimation

r_{mt} = the return of the Bahrain Stock Exchange Composite Index during day t

e_{it} = the error term for security i in period t

r_{mt} is calculated as follows:

$$r_{mt} = \frac{I_t - I_{t-1}}{I_{t-1}}$$

Where I_t , I_{t-1} = the Bahrain Market Index values at the end of day t and day $t-1$.

The return r_{it} for each stock is the return due to price movements exclusive of any dividends. Although dividends are paid once a year, they are actually *earned* over the whole year. Thus, it makes sense to divide the annual dividends by 365 to get the actual daily dividend return. But since the typical dividend in Bahrain is 100 Fils or less, I felt that a daily return of less than half of a Fils or less will have a trivial effect on the results. Therefore, similar to the previous studies discussed in chapter 2, I limited daily returns to price returns as I am concerned with whether the split announcement has any effect on prices.

The behavior of stock returns using the above formula is studied for a *study period* of 121 days (60 days prior to the announcement and 60 days after the announcement with the announcement day being the 61st day.) Therefore, the study period will be 60 days prior to the announcement and 60 subsequent to the announcement day.

α_i and β_i are ordinary least square (OLS) estimates from the regression of the return of a stock on the market return. α_i and β_i are estimated on daily data for an *estimation period* of 60 days after the study period, or days +61 to +120 relative to the announcement. A post-study period was used as an estimation period because no daily market index data were available prior to 01 January 1991 and because some event studies have used a post-study period to estimate the market

model parameters such as GMT (1984), and Liljeblom (1989). For example, GMT believe that “average returns in the days subsequent to the announcement are an appropriate benchmark.....,” and “using the average return before the announcement would be an inappropriate benchmark since firms tend to split or pay large dividends after substantial price increase.”

The event study will be concerned mainly with the sample *average regression residuals* or the *average excess return* of the 20 stocks in our study for each day of the 121-day *study period*-days -60 through day +60.

The average regression residual is defined as follows:

$$e_t = \frac{\sum_{i=1}^{20} e_{it}}{20}$$

where e_t = the average of the residuals (e_{it}) of the 20 stock in day t calculated in (1) above.

We are also interested in calculating the sample cumulative average residual as follows:

$$E_t = \sum_{d=-60}^t e_d$$

The average residual e_t can be interpreted as the average abnormal return in day t relative to the announcement date. Similarly, E_t can be interpreted as the cumulative average abnormal return from day -60 to day t relative to the announcement date.

A standard t-test is used to test the null- hypothesis that the difference between the mean daily average residual, or excess return (e_t) for the event day in question,

and the grand mean average, or excess return over the entire study period ($\bar{e}$), is 0. The grand mean average, or excess return, is defined as follows:

$$\bar{e} = \sum_{t=-60}^{t=+60} \frac{e_t}{121}$$

3.5 **SUMMARY OF RESEARCH METHODOLOGY**

This research tests the hypothesis that Bahrain Stock Exchange is efficient using a typical event study methodology. Event studies generally do not study the price reaction of individual companies but rather they are concerned with whether the event itself is associated with some kind of return behavior. Therefore, this study will focus on the behavior of the *average* error terms of all stocks. The study traces the *average* residuals of the Market Model, that is, any abnormal return over the 121-day study period centered on the announcement day. The market model parameters for each individual stock will be calculated using an estimation period of 60 days beginning on day +60 relative to the announcement.

CHAPTER 4

DATA ANALYSIS AND FINDINGS

4.1 MARKET MODEL PARAMETERS

To isolate abnormal returns due to stock splits from normal returns, the market model is used to estimate normal returns. The model is applied to every company in this study (20 companies) in order to estimate its α and β . α and β are then used to estimate normal returns. The estimation period is from day +61 to day +120 relative to the stock split announcement day of each company. The results obtained are as follows:

Market Model Parameters α_i and β_i

Company Name	Intercept	P-value	β	P-value
National Bank of Bahrain	-0.0003	0.8176	1.0196	0.0049
Bank of Bahrain & Kuwait	0.0017	0.5159	1.6109	0.0000
Al Ahli Commercial Bank	0.0002	0.3950	1.7026	0.1588
Bahrain Islamic Bank	0.0000	undefined	0.0000	undefined
The Bahraini Saudi Bank	0.0005	0.8134	3.7469	0.0003
Bahrain Insurance Co.	0.0000	undefined	0.0000	undefined
Bahrain Kuwait Insurance Co.	0.0000	undefined	0.0000	undefined
Al Ahlia Insurance Co.	0.0000	undefined	0.0000	undefined
Bahrain Ship Repairing & Engineering Co.	0.0002	0.3342	0.0035	0.9644
Bahrain Cinema Co.	-0.0013	0.2592	-0.0971	0.6705
National Import & Export Co.	0.0019	0.0948	0.8881	0.0011
General Trading & Food Processing Co.	-0.0002	0.6796	-0.1974	0.1371
Bahrain Maritime & Mercantile Co. (BMMI)	0.0020	0.3393	0.7132	0.0237
Bahrain Telecommunication Co.	0.0008	0.1414	1.8911	0.0000
Bahrain Car Park Co.	0.0008	0.3815	0.2329	0.1557
Bahrain Flour Mills	0.0010	0.4685	0.6765	0.0166
Bahrain Light Industries Co.	-0.0012	0.3309	-0.0748	0.8890
Delmon Poultry Co.	0.0056	0.2942	0.8491	0.5416
Bahrain Hotels Co.	0.0001	0.9289	0.2075	0.4172
Bahrain Tourism Co.	-0.0001	0.9519	1.8213	0.0003

As it can be seen from the above table, α is approximately 0 for all stocks. The probability that this value of α is not within the 95% confidence interval (the P-value) is very high, which means that α may not be a very good parameter to estimate expected returns for the study period. However, as all estimated α 's are very close to 0, it was suspected that they will influence the goodness of fit of the regression line and therefore they are used to estimate normal returns for the study period.

There are four companies for which α and β couldn't be estimated for the chosen estimation period. These companies are:

Bahrain Islamic Bank

Bahrain Insurance Company

Bahrain Kuwait Insurance Company

Al Ahlia Insurance Company

There was no trading or only odd-lot trading for these stocks during the estimation period. Therefore, the stock prices of these companies remained unchanged and hence their returns were always 0 during this estimation period.

Unlike the α estimates, many of the β estimates were very good indeed, The probability of error or for P-values ranged from 0 (rounded to the nearest four decimal) to 0.96 for Bahrain Ship Repairing & Engineering Co.

Again, Bahrain Ship Repairing & Engineering company is very inactively traded. In the 60-day estimation period, there was only one day on which this company was traded. That is, there is only one day in which the stock's return was not 0. Therefore, the β estimate for this company wasn't very meaningful.

The problem of non-trading is ever present in the Bahrain Stock Exchange. There are many stocks which are not traded for months like Bahrain Ship Repairing and Engineering Company, Bahrain Light Industries Co., and the three local insurance companies. As mentioned earlier in the limitations of this study under section 7 of chapter 1, non-trading makes stock returns equal to 0 and thus affects the measurements of α and β .

Apart from Bahrain Ship Repairing and Engineering Co., β 's for the commercial banks sector are very good indeed with P-values around 0 except for the Al Ahli Bank, whose P-value equals .155 and except for the Islamic Bank whose α and β could not be estimated due to non-trading over the entire estimation period. It is interesting to note that β 's exceed 1 for the commercial bank sector with the highest being the Bahrain: Saudi Bank of 3.74. The β value for National Bank of Bahrain is close to 1. The commercial bank sector is the most actively traded sector on the Bahrain Stock Exchange; therefore, the P-values or the probability of the error term, are very close to 0.

Other companies for which the P-values, the probability of error, for β estimates are 0 or close to 0 are: Bahrain Telecommunication Company (Batelco), Bahrain Tourism Company, Bahrain Maritime and Mercantile company (BMMI) and National Import & Export Company. The β value is close to 2 for Bahrain Tourism Company and for Batelco, and close to 1 for BMMI and for National Import Company. In many cases the higher betas (β 's) are associated with lower P-values; that is, there are better estimates of stock returns in relation to market returns.

In summary, the Bahrain Stock market is a miniature market with many stocks that are not traded for months. The commercial bank sector is the most actively traded sector and has better relations between individual stocks returns and market returns compared to the rest of the listed companies.

After estimating individual α 's and β 's for each company, they were then used to calculate normal returns during the *study period* from day -60 to day + 60 days relative to the split announcement day of each of the 20 stocks in this study. However, because α & β could not be estimated for the three insurance companies nor for Bahrain Islamic Bank, these companies' excess returns were not included in the next part of the study which is concerned with the cross-sectional excess return during the 121-day study period. In addition, Bahrain Ship Repairing and Engineering Co. was also excluded as there was only one observation in which the stock return was not 0 during the 60-day estimation period. Therefore, the next part of the study is limited to the remaining 15 companies out of the 20 originally included in this study-to ensure that the results are not affected by these outliers.

Among the 15 stocks for which the cross-sectional excess returns are calculated, there are 4 stocks whose P-values (the probabilities of the error term) are high. However, these stocks were included because, in my opinion, regression results still provide better results compared to alternative methods of calculating returns such as the method of the arithmetic mean. The arithmetic mean returns of these not actively traded stocks are 0 or close to 0 due to non-trading. Moreover, excluding these companies will leave us with only 11 companies from which to calculate Cross-Sectional Excess Return and I consider this to be too small a sample.

4.2 CROSS-SECTIONAL RESIDUALS OR EXCESS RETURNS

This section, which is the heart of the study, discusses the behavior of the Cross-Sectional Excess Returns for the 15 remaining companies. It is concerned with the behavior of excess return 60 days prior to the announcement day and 60 days after the announcement day with the *announcement day* centering this 121-day period. As mentioned earlier in section 3.4, the Cross-Sectional Excess Returns are discussed and analyzed as opposed to the behavior of excess return for individual companies to avoid the eccentricities associated with individual companies. Excess return for each stock was obtained by subtracting estimated expected returns using α and β obtained in section 4.1 from the actual event day return. The cross-sectional excess return was obtained by averaging the 15 firms' excess return for each event day.

The cross-sectional excess return for each day of the 121-day study period, the cumulative return up to event day, the standard deviation of these cross-sectional returns, as well as the corresponding t-tests are presented below:

Average Excess Return (e_t) and Cumulative Excess Return (E_t) from day -60 to day +60

Event day	Average (e_t)	Cumulative Average (E_t)	Standard Deviation	t-test result	
-59	-0.006	-0.006	0.014	0.011	**
-58	-0.004	-0.01	0.013	0.01	**
-57	-0.001	-0.011	0.006	0.005	*
-56	-0.005	-0.016	0.008	0.007	*
-55	0.001	-0.015	0.009	0.007	*
-54	-0.003	-0.018	0.005	0.004	*
-53	0.002	-0.016	0.009	0.007	*
-52	-0.004	-0.02	0.013	0.01	**
-51	0.001	-0.019	0.008	0.006	*
-50	0.004	-0.014	0.027	0.021	**
-49	0.001	-0.014	0.004	0.003	*
-48	-0.001	-0.015	0.005	0.004	*

Event day	Average (e_t)	Cumulative Average (E_t)	Standard Deviation	t-test result	
-47	0	-0.015	0.005	0.004	*
-46	0	-0.015	0.014	0.011	**
-45	-0.001	-0.016	0.003	0.002	*
-44	-0.007	-0.023	0.016	0.012	**
-43	-0.002	-0.025	0.020	0.016	**
-42	-0.006	-0.032	0.014	0.011	**
-41	-0.003	-0.034	0.013	0.01	*
-40	-0.002	-0.037	0.014	0.011	**
-39	-0.002	-0.039	0.005	0.004	*
-38	-0.002	-0.04	0.007	0.005	*
-37	-0.002	-0.042	0.007	0.005	*
-36	0.005	-0.038	0.018	0.014	**
-35	-0.01	-0.047	0.015	0.012	**
-34	0.001	-0.046	0.021	0.017	**
-33	-0.003	-0.049	0.008	0.006	*
-32	-0.002	-0.052	0.006	0.005	*
-31	0.004	-0.048	0.017	0.013	**
-30	-0.003	-0.05	0.006	0.005	*
-29	-0.026	-0.076	0.098	0.077	
-28	-0.001	-0.077	0.01	0.008	*
-27	-0.002	-0.079	0.014	0.011	**
-26	-0.001	-0.08	0.002	0.002	*
-25	-0.001	-0.081	0.003	0.002	*
-24	0.005	-0.076	0.02	0.015	**
-23	0.044	-0.032	0.176	0.137	
-22	-0.002	-0.034	0.005	0.004	*
-21	0.004	-0.029	0.03	0.024	**
-20	0.002	-0.027	0.008	0.007	*
-19	0.004	-0.023	0.016	0.013	**
-18	0.003	-0.02	0.014	0.011	**
-17	0	-0.02	0.004	0.003	*
-16	-0.006	-0.026	0.024	0.019	**
-15	0.006	-0.019	0.02	0.016	**
-14	0.006	-0.013	0.018	0.014	**
-13	0.003	-0.011	0.009	0.007	*
-12	0.001	-0.01	0.034	0.026	**
-11	0.001	-0.008	0.006	0.004	*
-10	-0.002	-0.011	0.01	0.008	*
-9	0.002	-0.009	0.011	0.009	*
-8	-0.001	-0.01	0.009	0.007	*
-7	-0.001	-0.01	0.012	0.009	*
-6	-0.007	-0.017	0.012	0.009	*
-5	-0.001	-0.018	0.004	0.003	*
-4	0.001	-0.017	0.004	0.003	*

Event day	Average (e_i)	Cumulative Average (E_i)	Standard Deviation	t-test result	
-3	-0.001	-0.018	0.006	0.005	*
-2	-0.003	-0.021	0.011	0.009	*
-1	-0.008	-0.029	0.025	0.02	**
0	0	-0.029	0.006	0.005	*
1	-0.012	-0.041	0.026	0.021	**
2	0	-0.041	0.004	0.003	*
3	-0.001	-0.042	0.004	0.003	*
4	-0.014	-0.056	0.027	0.021	**
5	0	-0.056	0.01	0.008	*
6	0.002	-0.054	0.017	0.013	**
7	-0.003	-0.057	0.009	0.007	*
8	-0.009	-0.066	0.017	0.013	**
9	-0.002	-0.068	0.003	0.002	*
10	-0.006	-0.073	0.025	0.02	**
11	-0.002	-0.075	0.007	0.005	*
12	-0.001	-0.076	0.007	0.005	*
13	-0.006	-0.082	0.023	0.018	**
14	-0.011	-0.093	0.021	0.016	**
15	0.001	-0.092	0.006	0.005	*
16	-0.002	-0.094	0.004	0.003	*
17	0	-0.094	0.004	0.003	*
18	-0.001	-0.095	0.008	0.006	*
19	0.01	-0.085	0.027	0.021	**
20	0.004	-0.081	0.019	0.015	**
21	-0.003	-0.084	0.006	0.005	*
22	-0.001	-0.085	0.004	0.003	*
23	0.002	-0.084	0.012	0.009	*
24	-0.005	-0.088	0.008	0.007	*
25	0.006	-0.082	0.017	0.013	**
26	-0.003	-0.085	0.010	0.008	*
27	0.003	-0.082	0.009	0.007	*
28	0.004	-0.078	0.009	0.007	*
29	-0.001	-0.079	0.007	0.005	*
30	-0.002	-0.081	0.003	0.003	*
31	0	-0.081	0.006	0.005	*
32	0.004	-0.077	0.024	0.019	**
33	0.001	-0.076	0.022	0.017	**
34	0.006	-0.07	0.022	0.017	**
35	-0.004	-0.074	0.007	0.005	*
36	-0.003	-0.077	0.009	0.007	*
37	-0.005	-0.082	0.009	0.007	*
38	-0.001	-0.082	0.003	0.003	*
39	-0.003	-0.086	0.013	0.011	**
40	-0.007	-0.092	0.019	0.015	**

Event day	Average (e_t)	Cumulative Average (E_t)	Standard Deviation	t-test result	
41	0.003	-0.089	0.014	0.011	**
42	0.005	-0.084	0.023	0.018	**
43	-0.001	-0.085	0.008	0.006	*
44	0.003	-0.081	0.013	0.010	**
45	-0.006	-0.087	0.021	0.017	**
46	-0.001	-0.089	0.005	0.004	*
47	0.005	-0.084	0.029	0.023	**
48	0.007	-0.076	0.013	0.011	**
49	-0.003	-0.079	0.005	0.004	*
50	0	-0.079	0.004	0.003	*
51	-0.002	-0.081	0.004	0.003	*
52	0.005	-0.076	0.024	0.019	**
53	0.001	-0.076	0.016	0.012	**
54	0.001	-0.075	0.011	0.009	*
55	-0.002	-0.077	0.004	0.003	*
56	0	-0.077	0.004	0.003	*
57	0	-0.077	0.005	0.004	*
58	0.002	-0.075	0.015	0.012	**
59	0.002	-0.073	0.011	0.009	*
60	-0.004	-0.077	0.012	0.009	*

* at the 99 percent level

** at the 95 percent level

If we take a look at the results obtained from this study, we find results that are very different from the results of the studies reviewed in Chapter 2 of this research. The announcements of splits didn't occur after a run-up in price or during a bullish market as it is evident from the Cumulative Average Excess Return of -2.9% from the beginning of the study period up to the day preceding the announcement day (days -60 to -1).

Almost all studies discussed in chapter 2 of this research have shown that splits occur after a rise-up in stock prices. The Cumulative Excess Return or the Cumulative Residual Error term for the 10 days preceding the announcement of the split was around 5% in the Arbel and Swanson study (1993), for example;

Lakonishok and Lev (1987), FFJR (1969), Liljeblom (1989) and GMT (1984) all had similar results. In fact, these researchers accredit “Optimal Trading Range” as a plausible justification for undertaking stock splits. Many of these researchers provided evidence that splits were undertaken to restore prices to their normal trading range. The theory of Optimal Price Range is well-accepted and is preferred by many researchers to the Signalling theory as a plausible reason underlying splits. Signaling theory is also well-accepted as a reason for stock splits, However, one of its assumptions-that there is a cost of low-value firms to mimic the financial decisions of high-value firms-is not apparent. There is no apparent cost to stock splits; therefore, GMT (1984) doubt this theory.

Unlike the Bahrain Stock Exchange firms, firms that split their stocks in the studies discussed in chapter 2 have performed unusually well during the pre-split period. In fact, Fama (1991) argues that a crucial issue in the debate for market efficiency is how much residual variance, generated by the deviation from the firm average is rational, meaning that positive residual often exists in event studies. This is certainly not the case for the Bahrain Stock Exchange. It seems that these splits are announced and approved at the extraordinary meetings without looking at previous performance of the stocks, for they are certainly not a result of a rise-up in prices and are not intended to restore price to its optimal trading range. There is no clear trend similar to that documented in previous split announcement studies that the market anticipates a split after a price increase, as there is no price increase prior to the split. The t-test provides evidence that there is no significant difference between event days -60 to -1 excess returns and the grand mean daily return of the study period. The difference isn't statistically different from 0.

Both signaling and optimal trading range theories are based on price run-up prior to the split, which is absent in this study. Therefore, we cannot find a theory to justify Bahrain companies' decision to split their shares.

The results obtained for the cumulative excess return are true even if we look at individual stock excess returns. For example, I looked at individual stock excess returns for 5 of the most actively traded stocks on the Bahrain Stock Exchange: National Bank of Bahrain (NBB), Bank of Bahrain and Kuwait (BBK), Al Ahli Commercial Bank, National Import and Export Company (IMEX) and Bahrain Telecommunication Company (Batelco). Their excess returns around the announcement day are as follows:

Event day excess return for the 5 most actively traded stocks

Days	NBB	BBK	AlAhli	IMEX	Batelco
-2	-.012	0.00	-.039	-.005	-.001
-1	-.005	-.001	-.007	-.018	-.001
0	-.003	.020	-.002	-.002	0.00
1	0.00	-.002	-.002	-.002	-.067
2	0.00	.012	-.002	-.002	-.001
-60 to - 1	.006	-29.1	-.048	-.175	.072

As we can see, the major stocks of the BSE have not experienced any appreciation in price or any unusual behavior. They are just like the average of all stocks in the study and provided no insight as to why the majority of firms chose to split their shares.

What happens when the firm actually announces and gets the necessary approval for its intention to split its shares? Does the market interpret this information as good news or bad news? How do prices respond?

Surprisingly, again, the market doesn't react to stock splits. That is, the Bahrain Stock Market does not interpret split announcements as a management signal of favorable information. In most of the studies discussed earlier, the market reacts positively and quickly to these announcements. These studies have documented positive return on day 0 and even on day 1 in some cases, i.e., Arbel & Swanson, Liljeblom. Furthermore, the market reaction does not depend on concurrent dividend announcements, or on anticipation of future increase in dividends as many researchers have found, such as GMT (1984).

Here in Bahrain, the event day return is 0 while the returns for days -60 to -1 were randomly distributed around 0; some were positive and some were negative but with a cumulative average of - 2.9%. Therefore, we cannot assume that the market was anticipating a dividend increase, and that this anticipation is already discounted in stock prices so that the actual announcement is not met with a quick price increase.

The cumulative excess returns for days +1 and +2 are -1.2% and 0, respectively. The excess returns thereafter are mostly negative with cumulative excess return for days -60 to day +60 of -7.7%, or -5.5% for days +1 to +60. Does this mean that the market reacts negatively to stock split announcements? Comparing pre-announcement returns with the post-announcement returns, negative returns were abundant in the pre-split period, as well. Therefore, we cannot conclude that the negative returns were a result of the split announcement.

Furthermore, the t-test clearly indicates that there is no significant difference between the daily cross-sectional excess return for any of the announcement days (days 0 and 1) and the grand mean daily excess return. The null-hypothesis is

therefore validated at least at the 95% level for 119 days out of the 121-day study period. In the studies discussed in chapter 2, post-announcement returns were 0 or minimal in many cases and accordingly it was concluded that the market is efficient in the sense that stock prices react rapidly to new information. Although, the post-split excess returns were randomly distributed around 0 similar to other study findings, a similar conclusion cannot be reached as the return behavior is not different from the pre-split period.

4.3 THE AMIRI DECREE

To shed more light on the puzzling results obtained in this research, and to gain more insight into the local firms' decision to split, I felt it would be useful to know the rationale behind the decision to split from the local firms themselves. Therefore, I have contacted Bahrain Kuwait Insurance Company and Delmon Poultry Company to inquire about their reasons for undertaking splits. No clear answer was given and they thought that it was a decision of the Ministry of Trade and Agriculture. Further investigation with the Ministry of Trade and Agriculture revealed that there was an Amiri Decree dated 14th October 1990 which changed the minimum Par value of stocks from BD 1.000 to BD 0.100. This Amiri decree is attached in Appendix 1. In Arabic Accordingly, the president of the Bahrain Stock Exchange wrote recommendation letters to the Board of Directors of local firms recommending the split of their shares. According to BSE, the amendment which changed the minimum Par value from BD 1.000 to BD 0.100 was intended to encourage a wider role for small investors on the newly established exchange.

4.4 IS THE BAHRAIN STOCK EXCHANGE EFFICIENT?

This question cannot be easily answered based on the research results. The neutral results obtained coupled with the fact that there is an Amiri Decree suggesting (requiring) firms to split make it difficult to draw a conclusion. The Amiri decree may shed light on why the local firms decided to split their shares but makes the answer to the efficiency question even harder. Nevertheless, we can argue that the BSE is inefficient.

Market efficiency means that security prices fully reflect all available information. The heart of market efficiency according to Fama (1991) is the speed of price response to new information. There was no price response to the announcements of splits in Bahrain. This may be due to a realization that the split is only a cosmetic change required by the government. By the same token, the lack of response to new information may be due to the fact that the market is not doing a good job of analyzing various types of new information and not fulfilling its role properly. Both explanations imply inefficiency. There is a law requiring firms to split without looking at the firms' own needs. Or there is ignorance on the market part.

The signalling hypothesis as a rationale for splits doesn't hold for the BSE either. Many finance theorists like FFJR (1969), Lakonishok and Lev (1987) believe that splits are considered as messages of stabilizing unusually high profit and are reassuring signals from management to investors that future prospects of its firm look fine. But by splitting their shares what are local firms trying to signal? The previous performance was not unusually outstanding. The excess return were randomly distributed around 0 and the performance seems usual. Therefore, the to split decision was not a natural consequence to superior performance. Signalling is

not a reason for the firms' decisions to split. The splits were undertaken to comply with a decree suggestion without any legitimate internal reason at the firm level. This lack of independence/rationale for the decisions to split implies inefficiency as well.

As with the Signalling Hypothesis, for the Optimal Price Range theory to hold, there must be a price increase before the split. The absence of price run-up before the split means that we can not accept this theory as a plausible explanation for undertaking splits. Market prices were not returned to their normal trading range after a price run-up but were actually downscaled. The Amiri decree actually downscaled the prices of local stocks instead of returning them to their normal trading range. Optimal Price theory as a plausible explanation underlying splits is absent in the BSE. Therefore we cannot find a justification for a firm's decision to split except in the context of the Amiri decree. This again implies inefficiency.

It is worth mentioning that there was no control of contamination of data for concurrent announcements in this research due to the size of the sample used. The announcement of splits are always announced with the annual statements because here in Bahrain, there is a tradition that Annual General Meetings are held together with the Extraordinary General Meetings. As for the actual dividends for 1991, 80% of the firms in this study announced no change in dividends, while the rest had a dividend increase. Signalling and optimal trading range are usually given as a justification for the "announcement effect" for pure splits. However, the FFJR (1969) study which did not control for contamination of data, related the positive price reaction at the announcement month to a more fundamental reason of anticipated dividend increase and not to the intrinsic effect of the split itself.

Nevertheless, neither FFJR's justification for the announcement effect nor the Amiri decree explain the neutral price reaction for the 20% of the firms in this study who announced dividend increase. This lack of response to favorable announcements on the market part means inefficiency.

The results obtained in this research are not due to the averaging effect. On the announcement day, the returns for individual stocks were mostly 0 or negative, i.e. the cross-sectional average is representative of individual stock returns on the announcement days. That is, the neutral results are valid even at the individual firm level.

It could be that the results obtained here were a result of the joint hypotheses problem present in any test of market efficiency in the sense that the market model used, or the estimation period used, or both, were inadequate. This possibility is unlikely however; because event studies tend to attenuate this problem according to Fama (1991). In regard to actual price reactions on the announcement days, prices were either unchanged or changed slightly unlike other split studies discussed, where the change were substantial. Nevertheless, the joint hypothesis problem should always be considered as a possibility for unusual results because, as Fama (1991) puts it, "evidence of predictability should always be met with a healthy dose of scepticism."

Another theory given as a justification for undertaking stock splits is "Increased Marketability or Liquidity". Some financial theorists, such as Muscarella and Vetsuypens, as well as managers of splitting firms, in their survey believe that splits improve the liquidity and marketability of the stocks by lowering stock prices and increasing their shareholder base. As there was no signalling in local split

announcements (no run-up in prices), one possible reason is that local splits were undertaken to improve liquidity or marketability of the firms. It seems that the Amiri decree intention complies with this theory by encouraging small investors to participate in the newly established exchange. This might indicate an inefficiency. It seems that participation in the exchange is very limited so as to require legislating a law to encourage more participation and to allow a wider shareholder base.

It is clear from the above discussion that splits that occurred in Bahrain in 1991 were received neutrally. This neutral reaction may be due to the Amiri decree or to the intrinsic characteristics of the BSE itself. The splits were undertaken aimlessly. There is no signaling; the purpose was not to return prices to their normal trading range, either, as prices were actually downscaled. Even if we accept the FFJR (1969) original justification that the split effect is due to anticipation of increased dividends, this does not explain the negative or zero returns for those stocks who announced a dividend increase. The only real cause for undertaking the split seems to be the Amiri decree.

The neutral results-coupled with the fact that there is indeed an Amiri decree suggesting the split-makes the results of this research inconclusive. But as I discussed above, the absence of any valid justification for the local firms' decision to split and the existence of the Amiri decree lean me towards the conclusion that the Bahrain Stock Exchange is inefficient. Furthermore, the unique characteristics of the BSE as well as the timings of the splits further support my argument.

First, the problem of thin trading is ever present on the Bahrain stock Exchange. The BSE is a very thin market with stocks that are not traded for months. We don't expect a high degree of efficiency in thin markets. Thin trading has always

provided controversial evidence for market efficiency, even on exchanges like NYSE. For example, the issue of “Small firm-P/E effect,” in which small firms have excess returns, hence contradicting market efficiency, is caused by thin trading. The excess returns of small stocks was due to the bias of Beta (β) estimates caused by infrequent trading. Infrequently traded stocks would have a smaller variance and Beta estimates (Radcliff (1987)). Even the famous January effect that excess return are predominant in the month of January is related to small size firms. Therefore, I don’t expect a high degree of efficiency with thin trading and accordingly the BSE cannot be efficient with this obviously problematic condition.

Second, 21 of the 26 listed stocks in the BSE, or 80% of the firms, underwent split over a 18-month period. This clearly implies a lack of independence for the firms’ decisions and indicates inefficiency. The splits were only made to comply with the Amiri decree and for no apparent reason or real aim on the firms’ part.

Third, few individuals hold the majority of stocks according to Al Jowder (1993). Therefore, efficiency is not expected under such a condition.

Fourth, the splits in this study occurred in 1991 right after the second Gulf War, or during a recession period, and may be an attempt to improve the market. Moreover, in 1991, the market was only one year old and a high degree of efficiency can’t be expected within such a short period of time.

4.5 SUMMARY

Unlike the typical results of event studies, there was no price increase upon the announcement of splits on the Bahrain Stock Exchange. The day 0, return was 0 followed by negative and 0 returns for days +1 and +2. Furthermore, there was no market anticipation of stock splits since the pre-announcement returns were randomly distributed around 0 and splits didn't follow a price run-up. It seems that splits that occurred in 1991 were merely made to comply with the Amiri decree and may be attempted to improve marketability.

As to the issue of market efficiency, the neutral results, coupled with the existence of an Amiri decree suggesting the split, make the results of this research inconclusive. Event studies are concerned with the speed of adjustment of stock prices to new information. In an efficient market, prices change only when new information enters the market. By splitting their shares, the firms were only complying with the suggestion of the Amiri decree and were not conveying any new information to the market. The absence of any reason that could justify the local firms' decision to split, other than the Amiri decree, lead us to conclude that the BSE is inefficient. None of the theories discussed as a reason for split is valid. Moreover, the decision was a collective one over a short period of time, clearly indicating lack of efficiency.

Event studies study a firm's unique events such as splits and mergers. However, it seems that the splits in Bahrain were not a "firm-unique event" in the sense that they were undertaken by the majority of the local firms. This also hinders our ability to draw a meaningful conclusion.

Common sense, thin trading, the short life of the BSE, the timing of the splits, as well as the results obtained in this research lead us to conclude that the Bahrain Stock Exchange cannot be efficient against all these barriers.

It is clear that splits that occurred in 1991 were a mere “following the herd” type of decision to comply with the Amiri decree’s suggestion and were not intended to signal favorable information or return prices to their normal trading range. “Following the herd” means lack of efficiency due to lack of independence among firms and it means arbitrary decisions that don’t have their corresponding economic justification.

Therefore, and despite the fact that the research results were not so conclusive, we can say that the Bahrain Stock Exchange is inefficient and that the splits that occurred in 1991 were merely taken to comply with the Amiri decree which may be aimed at improving the marketability in the then newly-established Bahrain Stock Exchange.

CHAPTER 5

CONCLUSION

5.1 CONCLUSION

Contrary to common sense, research on stock splits have proven that the pie gets bigger the more it is sliced. Chief financial officers of major firms continue to divide their shares and conquer.

Fama, Fisher, Jensen and Roll (1969) were the first to use split announcements to test the speed of price's adjustment to firm's events.

FFJR (1969) were somewhat aggressive in interpreting the results obtained from their research by linking a positive announcement return found on the announcement of splits to a more fundamental reason of increased dividends or anticipation of increased dividends. FFJR argued that splits themselves are not the real cause for the price reactions.

Since this seminal study, event studies have become a boom industry with results that stand up under replication. More importantly, subsequent studies such as Grinblatt, Mausalis, and Titman (1984) have found announcement effect even in the case of "pure" or "non contaminated" splits.

These findings were the impetus for theories to explain such price behavior. One of these theories is "Signalling" and it states that by splitting their shares, management is sending a signal that its firm's prospects look promising. While this theory is widely accepted by finance theorists, some still reject it (Grinblatt, Mausalis, and Titman (1984)) on the basis that there are no real costs involved with the result that low-value firms can still mimic the financial decisions of high-value firms.

Another theory offered as a justification for the announcement's effect is the "Optimal Trading Range" hypothesis which states that by splitting their shares, management is trying to restore prices to their normal trading range after a price run-up.

These theories, in my opinion, are complementary. Signaling implies that the firms have been doing well and that management expects the same or a better future performance and thus is sending this message to investors by splitting their shares. Because the firm was doing well and its future looks promising, its price has gone up so that management finds it necessary to restore the price to its normal range by means of a split.

Another theory offered as a justification for stock splits is "Liquidity." By lowering its share price, management is trying to increase the shareholders' base and the marketability of its stock. Evidence on liquidity theory are mixed depending on the measure of liquidity used to test such hypothesis. However, all studies have documented an increase in the number of shareholders after splits.

Event studies such as stock splits present a good opportunity to test for market efficiency. For one thing, the joint-hypothesis problem becomes unimportant; when the response to an event is large and concentrated in few days, the model used to test normal returns becomes unimportant. For the other thing, the event days can be traced precisely so it is known for sure when new information first hit the market.

In the studies discussed in this research, most have documented that the announcement effect is over by the day of the split. Doran (1994), however, stated that on the split day the market reacts naively to the announcement, as evidenced by the revisions the security analysts made later on. Other studies such as Arbel and Swanson (1993), however, mentioned that the adjustment of stock prices to new information is quick, and there were no excess return over the previous ones. In their study, there was even some evidence of leakage in the case of large firms, meaning that price response is extremely quick.

This research has been concerned with the aspects of stock splits on market efficiency. However, understanding the theories given above as justification for stock splits helps us appreciate the research results.

The Bahrain Stock Exchange is a miniature stock market. It is a very thin market. Prices do not change very often and some stocks are not traded for months. There are only a handful of brokers. Nevertheless, we aspire that this market become efficient to help develop the economy of Bahrain. The implicit assumption of efficient market theory is confidence in the market. The wealth of the people is the issue at stake; therefore, efficiency is a necessary condition if we want to allocate capital where society needs it most.

The important question still remains: Is the Bahrain Stock Market efficient? The results obtained from this research were not conclusive but we can argue that it is inefficient.

Event studies study the response of the market to new information. But by definition new information is random. In this research there was no price response on the announcement day or up to 60 days after the announcement. That is, prices have not responded to new information. The lack of response is mainly due to the fact that the firms' decision to split was not an independent one but may be aimed solely at complying with the Amiri decree. There was an Amiri decree in 1990 changing the minimum par value to BD 0.100 instead of BD 1.000.

Signaling theory implies that management is sending a message to investors that performance of the firm is expected to be good (new information), wanting to give a reassurance signal to the investors. There is no signaling of any type in a stock split announcement in Bahrain. Therefore, it could be interpreted that splits were only undertaken aimlessly by local firms for no clear purpose except to comply with the Amiri decree.

If we consider "Optimal Price theory", then a pre-condition for this theory to be valid is a price run-up over the pre-split period. This not the case here in Bahrain. The prices preserved their normal relationship to the market during the pre-split period. Stock prices were actually downscaled by means of split. This theory does not hold for the BSE and it seems that splits were merely undertaken to comply with the amendment of an Amiri decree.

Therefore, despite the inconclusive results of my research, I am inclined towards the view that the Bahrain Stock market is inefficient, at least in response to stock split announcements. The local firms were just following other local firms' decision to split shares for no clear purpose except to comply with the Amiri decree suggestion. That is, Firms are not doing a very good job of evaluating their

decisions and many of the splits were undertaken aimlessly. As it seems, splits that occurred in 1991 were not a natural consequence to superior performance and it could be only a fad induced by a decree which attempted to increase liquidity during the formative stage of the Bahrain Stock Exchange.

5.2 SCOPE FOR FURTHER RESEARCH.

1. The stock-prices behavior might be examined around the ex-day- the actual day on which the split becomes effective to test whether results obtained are similar.
2. Other Local Event Studies such as mergers, accounting changes etc. could be studied to see if the results obtained are similar or are unique to stock splits.
3. Stock splits may be studied in other GCC countries to see whether similar results are obtained.
4. The number and mix of each splitting firm's shareholders may be studied to see if the amendment suggested by the Amiri decree has achieved its intended purpose of increased marketability.

BIBLIOGRAPHY

- Al Jowder, J. R., "Evaluation of Bahrain Stock Exchange using Capital Assets Pricing Model (CAPM)" - *unpublished MBA thesis*, College of Business Administration, Bahrain University (November 1993), Bahrain.
- Anonymous, "Splitting headache," *Economist*, 334, no. 7898(January 21, 1995), p: 76.
- Arbel, A. and G. Swanson, "The role of information in stock split announcement effects," *Quarterly Journal of Business & Economics*, 32, no. 2 (Spring 1993), pp. 4 -25, USA.
- Baker, H. and G. Powell, "Further evidence on managerial motives for stock splits," *Quarterly Journal of Business and Economics*, 32, no. 3 (Summer 1993), pp. 20-31.
- Bellemore, D. and L. Blucher, "A study of stock splits in the postwar years," *Financial Analysts Journal*, XV, (November, 1956), pp. 19-26, USA.
- Black, F., "Noise," *Journal of Finance*, 41 (1986), pp. 529-543, USA.
- Brown, S. J. and J. B. Warner, "Using daily stock returns: The case of event studies," *Journal of Financial Economics*, 14 (1985), pp. 3-32, USA.
- Constantinides, G., "Optimal stock trading with personal taxes," *Journal of Business*, (July 1986), pp. 65-89, USA.
- Copeland, T., "The evidence against stock splits," *The revolution in corporate Finance*, Basil Blackwell limited - UK.
- Copeland, T., "Liquidity changes following stock splits," *Journal of Finance*, 34 (March 1979), pp. 115-41, USA.
- Doran, D., "Stock splits: Tests of the earnings signaling and attention directing hypothesis using analysts forecasts and revisions," *Journal of Accounting, Auditing & Finance*, 9, no. 3 (Summer 1994), pp. 411-422, USA.
- Fama, E., M. Jensen, L. Fisher and R. Roll, "The adjustment of stock prices to new information," *International Economic Review*, 10, no. 4 (February 1969), pp. 1-21, USA.
- Fama, E., "Efficient capital markets: A review of theory and empirical work," *Journal of Finance*, 25 (1970), pp. 383-417, USA.
- Fama, E., "Efficient capital markets II," *The Journal of Finance*, 46 no. 5 (1991), pp. 1575-1617, USA.
- Firth, Michael and K. Simon, *Issues in Finance* - Philip Allan Publishers Limited (1986), UK.

- Grinblatt, M., R. Masulis, and S. Titman, "The valuation effect of stock splits and stock dividends," *Journal of Financial Economics*, 13, no. 4 (December 1984), pp. 461-490, USA.
- Jaffe, J. F., "Special information and insider trading," *Journal of Business*, 47 (1974), pp. 410-428, USA.
- Jong, F., A. Kemna, and T. Kloek, "A contribution to event study methodology with an application to the Dutch stock market," *Journal of Banking and Finance*, no. 16, (1992), pp. 11-36, North-Holland.
- Lakonishok, J., and B. Lev, "Stock splits and stock dividend: Why, who, and when," *Journal of Finance*, 42, no. 4 (September 1987), pp. 913- 932, USA.
- Lamoureux, C., and P. Poon, "The market reaction to stock splits," *Journal of Finance*, 42, no. 5 (December 1987), pp. 1347-1370, USA.
- Liljeblom, E., "The informational impact of announcements of stock dividends and stock splits," *Journal of Business Finance & Accounting*, 16, no. 5 (Winter 1989), pp. 681- 697, USA.
- Maloney, M., and M. Harold, "The effect of splitting on the ex: A micro structure reconciliation," *Financial Management*, 21, no. 4 (Winter 1992), pp. 44-59, USA.
- Ohlson J. and S. Penman, "Variance increase subsequent to stock splits: An Empirical Aberration." *Journal of Financial Economics*, 14 (June 1985), pp. 251-66, USA.
- Radcliffe, R. C., "Investment: Concepts, analysis, and strategy" Scott, Foresman and Company (1987), Glenview, IL, USA.
- Seyhun, H. N., "Insiders' profits, costs of trading, and market efficiency," *Journal of Financial Economics*, 16 (1986), pp. 189-212, USA.

APPENDIX (1)

مرسوم بقانون رقم (١١) لسنة ١٩٩٠
بتعديل الفقرة الثانية من المادة (١٠٣)
من قانون الشركات التجارية
الصادر بالمرسوم بقانون رقم (٢٨) لسنة ١٩٧٥

نحن عيسى بن سلمان آل خليفة
بعد الاطلاع على الدستور ،
وعلى الأمر الأميري رقم (٤) لسنة ١٩٧٥ ،
وعلى المرسوم بقانون رقم (٢٨) لسنة ١٩٧٥ باصدار قانون الشركات التجارية
والقوانين المعدلة له ،
وبناء على عرض وزير التجارة والزراعة ،
وبعد موافقة مجلس الوزراء ،

رسمنا بالقانون الآتي :

- المادة الأولى -

يستبدل بنص الفقرة الثانية من المادة (١٠٣) من قانون الشركات التجارية الصادر
بالمرسوم بقانون رقم (٢٨) لسنة ١٩٧٥ والمشار اليه النص الآتي :

" ويقسم رأسمال الشركة الى أسهم متساوية لا تقل القيمة الاسمية لكل منها
عن مائة فلس ولا تزيد على مائة دينار "

- المادة الثانية -

على الوزراء - كل فيما يخصه - تنفيذ هذا القانون ، ويعمل به من تاريخ نشره
في الجريدة الرسمية.

صدر في قصر الرفاع :

بتاريخ : ٢٥ ربيع الأول ١٤١١ هـ
الموافق : ١٤ أكتوبر ١٩٩٠ م

بقرار من وزير التجارة والزراعة والاقتصاد .

ثالثا : أن الحصص العينية قد قومت وفقا لاحكام القانون وقد تم الوفاء بها كاملة .

رابعا : أن المؤسسين قد عينوا الهيئات الادارية اللازمة للشركة . ويحفظ مع المحرر الرسمي صورة من الاوراق والمستندات المؤيدة للاقرارات المتقدمة الذكر .

مادة - ١٠١ -

لا يكون للشركة التي تؤسس وفقا لاحكام المنصوص عليها في المادة السابقة شخصية معنوية ، ولا يجوز لها ان تبدأ اعمالها ، الا بعد قيدها في السجل التجارى ونشر المحرر الرسمي الصادر بتأسيسها في الجريدة الرسمية وفي احدى الجرائد المحرة على نفقة الشركة .

مادة - ١٠٢ -

اذا تأسست شركة المساهمة على وجه غير قانوني جاز لكل ذى شأن أن ينذرها بوجوب اجراء التصحيح خلال شهر من تاريخ الانذار ، فاذا لم تبادر باجراء التصحيح اللازم خلال هذه المدة، كان له أن يطلب من المحكمة الكبرى الحكم ببطلان الشركة خلال سنة من تاريخ تأسيسها .

ولكن لا يجوز للشركاء أن يحتجوا تجاه الغير ببطلان الشركة ، وتصفى الشركة باعتبارها شركة فعلية ، ولا يخل ذلك بحق ذوى الشأن في رفع دعوى المسئولية التضامنية على المؤسسين وأعضاء مجلس الادارة الاول ومراقبي الحسابات الاولين .

الفصل الثانى

رأسمال الشركة

مادة - ١٠٣ -

يجب أن يكون رأسمال الشركة كافيا لتحقيق اغراضها ، محددا بالنقد البحرى ، ولا يجوز بعد العمل بأحكام هذا القانون ، أن يقل الصادر منه بأى حال عن خمسمائة ألف دينار في الشركات التى تطرح أسهمها للجمهور في اكتتاب عام ، وعن مائتى ألف دينار في الشركات التى لا تطرح أسهمها للاكتتاب العام . ويقسم رأسمال الشركة الى أسهم متساوية لا تقل القيمة الاسمية لكل منها عن دينار ولا تزيد على مائة دينار .

مادة - ١٠٤ -

تصدر الاسهم بقيمتها الاسمية ، ولا يجوز إصدارها بقيمة أدنى ، واذا أصدرت بقيمة أعلى خصصت الزيادة أولا لوفاء مصروفات الاصدار ثم للاحتياطى .

مادة - ١٠٥ -

يكون السهم غير قابل للتجزئة ، ولكن يجوز أن يشترك شخصان أو أكثر في سهم واحد أو في عدد من الأسهم على أن يمثلهم تجاه الشركة شخص واحد ، ويعتبر الشركاء في السهم أو الاسهم مسئولين بالتضامن عن الالتزامات المترتبة على هذه الملكية .