CHAPTER 1: INTRODUCTION

1.1 CAPITAL MARKETS AND MARKET EFFICIENCY

A phenomenon can be global in nature, only if, it has the capability to cut across borders, by truly adapting itself to the regional diverse factors and most importantly, capable of giving identical results. The markets become truly integrated, when the advancements in satellite technology made it possible for everyone, anywhere, in the world to receive uninterrupted information consistently and competitively. Information Technology and Institutional advancements facilitated dissemination of information quickly across economies and thus helped to understand and recognize the true intrinsic values of asset prices and to find various opportunities which were truly global in nature. Inspite of these advancements a phenomenon which has consistently baffled researchers across various disciplines, by being mysterious in nature, irrespective of abundant literature available has been the “patterns in stock returns”. The current stock market prices are often considered to be the indicators of investors’ current and future expectations. The patterns in stock returns reflect these expectations of the investors which might be based on rational and seemingly irrational behavior. Considering this, the stock markets would then be considered as the indicators of future economic trends. The presence of patterns in stock returns through empirical analysis is found to be complex to explain, and do not agree with the current asset pricing theories. These price change predictions or patterns, known as anomalies, can be an indication for investors to adopt unique trading strategies to make abnormal profits, or an indication of errors in current asset pricing theories. The study tries to examine the former possibility, which violates the idea of market efficiency.

With globalization and integration of markets, research findings obtained in one part of the world has been referenced and examined in other parts of the world to understand the true nature of these findings. Among those studies conducted, the presence of seasonality in the stock returns was considered to be a major finding which violated an important hypothesis in finance that is efficient market hypothesis (EMH). The EMH is considered to be the central paradigm in finance. According to EMH, past prices of shares should have no predictive power in judging the future prices. The EMH relates to how quickly and accurately the market reacts to new information. New information refers to new data which constantly enters the market.
such as government’s reforms, economic reports, company announcements, political statements, or public surveys. If markets are informationally efficient, then security prices would incorporate the new information rapidly and accurately. In particular, stock returns would follow a random walk, which is unpredictable and without pattern. According to Eugene Fama (1970 and 1991), when markets are fully efficient, the prices of assets fully reflect all available information, provided the marginal costs of obtaining the information do not exceed the marginal benefits. According to Elton and Gruber (1994), “When someone refers to efficient capital markets, they mean that security prices fully reflect all available information”. Gu and Finnerty (2002) conclude that market efficiency is rather a dynamic concept than a static concept, which meant that markets can become more efficient with time due to advancements in information technology, with more experienced investors’ participation and with relaxed norms for investors to access markets such as lower transactions costs etc. Thus implying that overall economic prosperity, better regulatory reforms and with involvement of confident investors, one can observe increased trading and lower volatility in the capital markets.

The speed with which information is incorporated into security prices today to instantaneously adjust the prices to new levels decides the market efficiency according to efficient market theory, thus providing no opportunities for an investor to earn excess returns by undertaking fundamental or technical analysis. The term “Information” is rather ambiguous, and the capital markets are considered to be efficient in varying degrees. According to Fama, markets are efficient in three forms namely the weak form, the semi-strong form and the strong form. The weak form is direct repudiation of technical analysis since it believes that current stock prices reflects the information of the past and the new price movements are random in nature. Thus, one cannot earn an increased return consistently on the basis of price change prediction made on the basis of a correlation between past prices and future stock prices. It means that there is no existence of seasonal patterns in the capital market and stock prices move randomly. These price change predictions or seasonal patterns are called “anomalies” in the market. The semi-strong form is a direct repudiation of fundamental analysis since it believes that the current prices of stocks not only reflect all informational content of historical prices, but also reflect all publicly available information too. Strong form of efficiency believes that current
prices reflect all information both publicly and privately available information. Thus, overall market efficiency in all forms implies that, historical or public or privately, available information cannot be used to earn superior returns consistently. If these forms of market efficiency are repudiated, then the markets are said to be inefficient. The market inefficiencies have been generally, documented in three categories. The first category is based on the belief that employing specific trading strategies based on past information which are freely available to all investors can be utilized in making extraordinary profits. But, excess returns should vanish when investors as a whole massively make decisions on such information. The second category believes in earning abnormal returns by selecting stocks based on firm based information which is also freely available to all investors. The third category of market inefficiency has been documented to make extraordinary profits by analyzing the unexpected return patterns due to news announcements such as calendar based news, which is the research theme of the study. Studies on empirical regularities in security returns have rejected the hypothesis of markets being efficient and models especially, the asset pricing models to be not adequate. These results have paved way for research on explaining the market anomalies. The studies spanning nearly a century provided very interesting but, versatile explanation to the occurrence of seasonal anomalies which were unique to respective markets across the globe. The initial investigations however, provided evidence of seasonal anomalies in the U.S. capital markets and other developed markets but the pattern and types of anomalies varied from one study to another. With further investigations, the presence of calendar anomalies was understood to be omnipresent occurring in stock markets throughout the world. Documented evidences have been found to include calendar anomalies such as the January effect, day-of-the-week effect wherein investors devise trading strategies of selling securities on Fridays and buying on Mondays to make profits, half-month effect wherein returns are statistically higher over the first half of the month, the turn-of-the-month effect wherein statistically returns on the turn of the month were higher than other trading days, holiday effect wherein statistically returns on the holidays were higher than other trading days and so on. January effect is observed in many countries. In USA, December is the tax-month. It was observed that the financial houses would sell shares whose values have fallen to book losses to reduce their taxes. As a result of this selling, stock prices decline. However, as soon as December ends, people start acquiring shares and as a result the stock prices would increase.
This lead to higher returns in the beginning of the year, that is on January month. This calendar anomaly is also referred to as January effect. The year-end effect or January effects are true for the countries like U.S.A whose tax period ends in December. Whereas country like India and many more economies throughout the world follow different time periods as the tax-month. Wachtel (1942) was first to document the presence of seasonal anomalies in the U.S markets. Rozeff and Kinney (1976) were the first to document the evidence of anomalies in New York Stock Exchange (NYSE) stocks. Using data for the period 1904-1974, evidence of high mean returns in January as compared to other months were found. French (1980) analyzed daily returns of stocks for the period 1953-1977 and found that there was a tendency for returns to be negative on Mondays, whereas, they are positive on other days of the week. Lakonishok and Smidt (1988) examined the anomalies in the United States of America (U.S.A or U.S) stock market and concluded that turn of the month effects exist. Cadsby (1989) obtained similar results for Canada. Ogden (1990) analyzed the turn of the month effects in the United States using data from 1969 - 1986 and concluded that the standardization of payments at the turn of each calendar month induced a surge in stock returns. Aggarwal and Rivoli (1989), Choudhary (1991) and Balaban (1995) also found the day of the week effect in the United States and some emerging Asian equity markets. However, their data did not extend beyond 1987. In a study of the stock indices of ten countries over different time periods until the late 1980s, Cadsby and Ratner (1992) concluded that turn of the month effects exist in the U.S, Canada, Switzerland, West Germany, United Kingdom (UK) and Australia but not in Japan, Hong Kong, Italy and France. Aggarwal and Tandon (1994) found significantly negative returns on Mondays in nine countries and on Tuesday in eight countries, yet large and positive returns occurred on Friday in seventeen of the eighteen countries studied. Duobis & Louvel (1996) examined the day of the week effect for the French stock market along with other markets such as the U.S, U.K, German, Japanese, Australian and Swiss and concluded that Wednesday presented the highest return but the day with the lowest return was Monday. Balaban and Bulu (1996) examined the semi-monthly effect in the Turkish stock market and concluded that semi-monthly effects don’t exist in the Turkish stock market. Steeley (2001) found that the weekend effect in the U.K had disappeared in the 1990s. Tang and Kwok (1997) investigated the day effect on six indices and concluded that returns were negative on Monday and positive on Friday. Lian (2002) studied the monthly...
effect of stock returns in some Asia Pacific stock markets. The findings of the study confirmed turn of the month effect as most prevalent phenomenon in all stock exchanges but the half month effect was found to be weak and unstable. Hellstorm (2002) studied the calendar effects in stock returns covering 207 stocks on the Swedish stock market for the time period 1987-96 and concluded that the market had a very weak trend. On the basis of a survey, Russel and Torbey concluded that the efficient market hypothesis exists in the capital market but the results are inconsistent. Pandey (2002) found seasonal patterns in the Malaysian stock market using the monthly return data of the KulaLumpur Stock Exchange’s Composite Index and EMAS (Exchange Main Board All Share) Index and concluded that the return of December was positive and statistically significant in comparison to the returns of the rest of the months. Al-Saad (2004) examined seasonality in the Kuwaiti Stock Market and concluded that there was seasonality in July, which could be explained by the summer holidays. The investigations across emerging economies also found presence of seasonal anomalies. Officer (1975) and Keim, Kleidon and Marsh (1983) found presence of seasonal anomalies in Australia. Boudreaux (1995) found presence of month-end effects in Denmark, Germany and Norway. Jaffe and Westerfield (1989) found a weak monthly effect in stock returns of several countries. Aggarwal, Rao and Hiraki(1990) found evidence in Japan. Raj and Thurston (1994) found no significant anomalies in New Zealand markets. Alagide and Panagiotidis (2006) examined calendar anomalies in Ghana and assessed the policy and institutional changes on stock returns. Doran et.al (2008) examined seasonality in Chinese markets and found that turn of the Chinese New Year is more volatile than January.

Thus the empirical investigations on the behavior of the stock market patterns across the world have raised several interesting questions about market efficiency of several developed and developing economies. The search for an explanation of stock market anomalies, however, has largely been unsuccessful. None of the attempts to modify the Capital Asset Pricing Model (CAPM) to account for taxation, transaction costs, skewness of preference and asymmetric information adequately explain the anomalies. Thus, our understanding of the economic or statistical causes of the apparent excess returns generated by anomalies is incomplete.
1.2 INDIAN STOCK MARKET AND MARKET EFFICIENCY

India, after USA, hosts the largest number of listed companies in the world. Of late, global investors are bee-lining around India as it has gained reputation as a preferred destination for investments. Indian securities market is considered as one of the oldest stock market in Asia and is seen to have matured from a rumor driven market to a more transparent, efficient and investor friendly market with changing times. The Bombay stock exchange (BSE), which started in 1875 as “The Native Share and Stockbrokers Association”, is the oldest exchange in Asia, even before the Tokyo Stock Exchange which started in 1878. The quantification of turbulence in 20th century in Indian markets was made possible with the BSE rolling out its major stock index called Sensex in 1986. This launch marked a milestone in integrating our markets to the global markets for the first time. Since then, in order to fulfill the need for still broader, segment-specific and sector-specific understanding and knowledge, BSE has continuously been launching different broad and sector specific indices. To elevate the Indian stock markets trading systems on par with the international standards, based on recommendation of high powered Pherwani committee along with Bombay Stock Exchange (BSE), the National Stock Exchange (NSE) was incorporated in 1992. Thus, standardization and internationalization of the Indian capital markets coupled with structural and regulatory changes commanded respect and trust among global investors for Indian financial markets. Liberalization of Indian economy during this period foresaw great growth potential in the fields of telecommunications, manufacturing, pharmaceuticals, media, Information technology, education, tourism and many other sectors. Thus Indian stock markets became the new investment destination for investors across the globe.

With improvements in technology, both the BSE and NSE stock exchanges have been able to undergo phenomenal change in recent years. Notably, the introduction of online trading systems, rolling settlement system and adoption of free-float market capitalization methodology for its indices has garnered more recognition and trust among investment community.

Rolling Settlement is a mechanism through which trading done on stock exchanges are settled on T+X days, where T is the trade day and X is the settlement on X working days, excluding the trade day. Indian stock market settlement mechanism in a phased manner adopted the rolling settlement system from the former
Account Period Basis system. After April 1st, 2002, the trades in all scrips listed and traded on the BSE and NSE exchanges were settled on Rolling Settlement mechanism. In Account period basis method, the trades done in a trading cycle of say, 5 days, would be consolidated, scrip-wise netted and settled on one of the working day of the following week. Thus, a minimum of one to two weeks would be required to settle the transaction. Whereas rolling settlement which is accepted internationally as best method would settle and net the trades in very specified period. Initially from January 2000 till July 2, 2001, Rolling Settlement mechanism was restricted to only certain scrips by the Securities and Exchange Board of India (SEBI) which was later revoked and mandated for all the large market capitalization companies which were part of BSE-200 index and having facility of deferral of the trading positions to adapt on T+5 basis. With effect from December 31st, 2001, Rolling Settlement mechanism was made compulsory for all listed securities on T+5 basis and Account Period Settlement was discontinued. Later on April 1st, 2002, trades were mandated to settle on T+3 basis as against previous T+5 basis. Thus introduction of rolling settlement mechanism lead to efficient delivery and payment based mechanism which would help in speedy transactions between buyers and sellers, thus in turn enhancing liquidity and transparency into the system.

Free-Float Market Capitalization methodology on the other hand is scientifically designed and is based on globally accepted construction and review methodology which is used by all major index providers like MSCI (Morgan Stanley Capital International), FTSE (a joint venture of Financial Times and London stock exchange), STOXX (a joint venture of Deutsche Borse AG and SIX STOXX Ltd), S&P (Standard & Poor’s) and Dow-Jones. The MSCI India Standard Index which is keenly followed to track Indian equity markets by Foreign Institutional Investors (FIIs) is also based on Free-float methodology. NASDAQ-100, the underlying index to the famous Exchange Traded Fund (ETF) - QQQ is based on the Free-float Methodology. All the BSE and NSE indices with a few exceptions such as BSE-PSU index have been calculated through the free-float methodology after September 1, 2003 onwards. Free-float by definition refers to all the shareholders except shareholding of investors who would not in the normal course come into open market trading who are treated as “controlling/strategic holdings and hence not included in free-float. Generally the categories of holding like shares held by
founders/directors/acquirers which has control element, shares held by persons/bodies with “controlling interest”, shares held by government as promoter/acquirer, shares holding through the FDI route, Strategic stakes by private corporate bodies/individuals, equity held by associate/group companies(cross-holdings), equity held by employee welfare trusts, locked in shares and shares which would not be sold in the open market in normal course are generally excluded from the definition of free-float. The level of index in the Free-float Market Capitalization methodology reflects the free-float market value of component stocks relative to a base period at any given point of time. The index value obtained is then calculated by dividing the free-float market capitalization of component stock in the index by a number called the Index Divisor. The Divisor is thus the only link to the original base period value of the indices and keeps the index comparable over time and is the adjustment point for all index adjustments arising out of corporate actions, replacement of scrips and due to other reasons. Thus on a continuous basis the values of indices are calculated during the trading hours based on the latest prices of the index scrips. Each company is categorized into one of the 20 bands as shown in the Table 1 below. A Free-float factor of say 0.55 means that only 55% of the market capitalization of the company will be considered for index calculation.

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<thead>
<tr>
<th>% Free-Foot</th>
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<td>&gt;0 - 5%</td>
<td>0.05</td>
<td>&gt;50 - 55%</td>
<td>0.55</td>
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<td>&gt;5 - 10%</td>
<td>0.10</td>
<td>&gt;55 - 60%</td>
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<td>&gt;10 - 15%</td>
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<td>&gt;60 - 65%</td>
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<td>&gt;15 - 20%</td>
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<td>&gt;65 - 70%</td>
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<td>&gt;20 - 25%</td>
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<td>&gt;70 - 75%</td>
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<td>&gt;25 - 30%</td>
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<td>&gt;75 - 80%</td>
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<td>&gt;30 - 35%</td>
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<td>&gt;80 - 85%</td>
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<td>&gt;35 - 40%</td>
<td>0.40</td>
<td>&gt;85 - 90%</td>
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<td>&gt;40 - 45%</td>
<td>0.45</td>
<td>&gt;90 - 95%</td>
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<td>&gt;45 - 50%</td>
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Source: www.bseindia.com
Free-float Market capitalization methodology has several advantages when compared to the previous methodologies. The methodology makes the index more rational, broad based and helps in achieving both active and passive investment styles by being benchmarked. Free-float methodology reflects the trading activity and liquidity in the market better than full market capitalization by being transparent in revealing ownership data. If free float methodology can significantly highlight only the free-float shares, then it will reflect higher trading activity of only free float shares traded mainly by institutional as well as individual investors (chan et. al, 2004). If full market methodology helps in documenting greater levels of institutional holdings (versus individual), then free float methodology based indices would be exhibiting stronger seasonal anomalies. Free-float methodology basically helps indices to consider only top few companies shares which are traded in the market. The methodology also improves index flexibility in terms of including any stock from the universe of listed stocks which improves market coverage and sector coverage of the index. Amateurs trading would thus exhibit more seasonal anomalies when compared to active trading by “professional” (Venezia and Shapira, 2007). In the sense, since free-float methodology gives higher weight to the company with higher free float in the index, it would be a great way to understand whether investors do consider trading strategically considering seasonal anomalies.

Other important initiatives and regulatory measures taken during the initial periods mainly, the Securities and Exchange Board of India (Depositories and Participants) Regulations, 1996 which made trading and settlement of securities in dematerialized form (December 2006), the SEBI (Mutual Funds) Regulations, 1996 lead to bringing transparency and clarity with respect to mutual funds regulations, the Buy Back of securities Regulations (November 14,1996), SEBI(Credit Rating Agencies) Regulations, 1999 (Nov 14,1998) and Disclosure of investor protection guidelines, 2000 (Feb 14, 2000), SEBI (Prohibition of fraudulent and Unfair Trade Practices relating to Securities market) Regulations, 2003 and SEBI (Depositories and Participants)(Amendment) Regulations 2004. These events played very significant role in drawing investors (both domestic and foreign investors) towards the stock markets and thus bringing confidence in the investors towards stock markets in India. FDI in India has been increasing steadily over years and the increase can be attributed...
to regulatory measures in India which have helped bring in transparency and accountability in Business practices over the years.

The existence of seasonality contradicts the EMH and violates the weak form of market efficiency because stock prices are no longer random and can be predicted based on past patterns. Thus market participants can devise trading strategies to gain abnormal profits on the basis of past patterns and assure success in investments in the Indian stock markets. If Indian stock markets are informationally-efficient, then market prices of assets should be equal to their true expected values, reflecting all information available to the market participants. Thus, outperforming the market through market timing or stock selection should not be possible by traders or any market participant. (Fama, 1965; Fama et al, 1969).

However, literature review with respect to Indian stock markets proves that market inefficiencies do exist and that calendar anomalies such as presence of day of the week effect, the months of the year effect etc. have been discovered. Pandey (2002) concludes that the monthly effects exist in the Indian stock market and investors can time their share investments to earn abnormal returns, although the results are still contradictory. Rotkar, Patel and Patil (2002) using data from January 1995 to December 1999 concluded that the stock returns are high on Wednesday and Monday while they are lowest on Friday. Nath and Dalvi studied the day of the week effect anomaly in the Indian stock market for the period 1999 to 2003 and found that before rolling settlement in January 2002, Monday and Friday had shown significantly higher returns than other days. However, after the introduction of rolling settlement, only the Friday effect is seen in the market. The study of Karmakar and Chakraborty (2003) indicated the presence of the Friday effect, the monthly effect, the turn of the month effect and the holiday effect in the Indian stock market. Mangla and Mittal (2005) tried to investigate the semi-monthly effect in 150 NSE listed stocks using data from January 1997 to March 2003 and the results supported strongly, the existence of a semi-monthly effect in the Indian stock market.

Although the literature on the Efficient Market Hypothesis and Seasonality (EMH, Fama (1970)) is very extensive, most studies in India focused on one type of test of hypothesis or one frequency of data, or either individual share or index data. However, none of the research studies consider all of these elements simultaneously. Thus, the question of whether or not Indian Stock Markets are efficient is best
answered by a comprehensive and concurrent analysis using the large data sets. The study concentrates on both high frequency (daily) and lower frequency (monthly, yearly) seasonal patterns, though it is known that profitable exploitation of high-frequency seasonal patterns is reported to disappear when transaction costs are taken into account (Lakonishok and Smidt, 1988).

1.3 ORGANIZATION OF THE DISSERTATION

The dissertation has been organized into five chapters as follows:

Chapter 1 presents a theoretical background of the concept of market efficiency, the area of research and the need for the research on calendar anomalies in Indian stock markets.

Chapter 2 presents an overview of existing literature on the calendar anomalies and the possible explanation. We aim to understand the basics of various anomalies, possible explanation to these anomalies and would try to provide evidence of existence of these anomalies in several markets throughout the world.

Chapter 3 presents objectives and methodology of the research. The data used for empirical testing, brief documentation of the examined indices and the methodological framework, basic statistical properties of the data series will be discussed in this section.

Chapter 4 presents research results and discussion. This section provides empirical results for each test performed on each index separately. The results of graphical and econometric analysis are provided in this section.

Chapter 5 presents emerging findings, conclusions and future research opportunities arising out of the current investigation. The section compares trading strategies based on calendar anomalies to a simple buy-and-hold strategy.

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