

**An Empirical Analysis of the Turn-of-the-month and  
January Anomalies in  
Five Emerging Stock Markets**

تحليل تجريبي لفترة ما بين الأشهر و شهر يناير  
في خمسة أسواق لأوراق مالية ناشئة

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## **Abstract**

The Efficient Market Hypothesis has been tested using various statistical models and approaches. The findings in the existing literature provide mixed strong evidence that financial markets are efficient and inefficient. Calendar anomalies are among the famous techniques that have attracted many academicians and investors to exploit, and find strong evidence of potential superior returns. These anomalies are cyclical patterns found in stock average returns that have seasonal affects and are based on the calendar. Examples of calendar anomalies include the January effect, the turn of the month and the Monday effect. The existence of calendar anomalies has been accepted in the academic field as many studies have found strong evidence which can enable market participants make excess returns. This research attempts to re-examine the Efficient Market Hypothesis through exploiting the turn-of-the-month anomaly and the January effect in five emerging markets using a seven-year data from 2005 to 2011. The findings show that there is no enough evidence of both anomalies in the five emerging markets.

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# **CHAPTER 1**

# **INTRODUCTION**

## Chapter 1: Introduction

Forecasting profitable trading rules in different financial markets, has always been attracting market participants and researchers for decades. Similar to the other securities, trading stocks implies taking high risks due to high uncertainty and volatility, leading to difficulty in forecasting stock price behavior. There are various simple and sophisticated models and trading systems that either succeeded or failed to accommodate nonlinear and complex reactions of share prices.

Contrary to the concept of the Efficient Market Hypothesis that presumes financial markets are normal and their prices always fully reflect all available information, financial market anomalies or seasonality are among the promising fields of forecasting share price behavior. The early convention that the share returns during the week days and the year months are equal and that market participants cannot make any extra profits, has become history. Calendar effects are among the most common market anomalies that have risen in the literature; they represent inefficiencies in the financial markets. Calendar effects include the holiday effect, the January effect, the weekend effect and the turn-of-the-month anomaly.

The initial study of the Efficient Market Hypothesis conducted by Fama (1970) strongly concludes that share price behavior is random and that it is not possible to consistently make abnormal returns. Another theory that is based on the EMH is the Random Walk Theory that was also developed in the academic community. It basically states that changes in stock prices are “serially independent”; it claims that historical prices cannot be relied on to forecast price directions. In other words, stock price movements do not have predictable regular patterns. They are random. The Random Walk Theory also supports the buy-and-hold strategy as the best way to beat the market (Murphy, 1999). However, many market participants and academicians have found and reported many financial anomalies in the literature, that can be profitable. These anomalies have been tested statistically and their strategies have been proven to make superior returns.

Researchers have examined different calendar anomalies in different financial markets to look for profitable opportunities that might exist and enable them to make abnormal returns. They use different simple and sophisticated statistical models at 5% and 1% level of significance to test the average returns and address data snooping bias and other data problems. They constantly re-visit and re-test the EMH and the simple buy-and-hold strategy and compare the findings. In many cases where evidence of calendar anomalies is found and the EMH is rejected, the hypothesis finds it difficult to explain.

### **1.1 Aims and Objectives**

The main objectives of this research are: 1) to examine whether the turn-of-the-month anomaly exists in the five emerging markets: S&P CNX Nifty Index, RTS Russia Index, SSE Index, Bovespa Index and FTSE-JSE Index, 2) to test the January effect in the same five emerging markets, and 3) to suggest, based on the analytical results, suitable investment for the investors.

### **1.2 The Rationale of the Research**

This research is important because it contributes to the literature through examining the presence of the turn-of-the-month anomaly and the January effect in five emerging markets. The reason for selecting major emerging market indices is the shift in investment strategy from investing in advanced markets to investing in emerging markets especially after the latest financial crisis. These markets represent golden investment opportunities for many funds and investment managers. I believe that this paper is among the few researches that cover more than three emerging markets with very recent data. Many market participants are interested in exploring profitable opportunities in these markets especially after the global economic slowdown that has originated in the advanced markets in the US and Europe. This research explores the presence of the turn-of-the-month anomaly and the January effect in five emerging markets.

### **1.3 Research Problem**

According to the Efficient Market Hypothesis, financial markets are rational and their prices always account for all available data. As a result, it is impossible to beat the market and make abnormal returns (Fama, 1970). Though some findings in the literature do support this hypothesis, a lot of other findings reject this concept. The current literature has provided good

evidence that some calendar effects do exist and enable market participants make superior returns.

## **1.4 Null Hypothesis**

The following two null hypotheses will be tested in order to examine the turn-of-the-month anomaly and the January effect in the five emerging stock market indices. Each null hypothesis is provided with an alternative hypothesis.

- Ho: There is no difference between the average returns of the turn of the month and the average returns of the rest of the month.
- Ha: There is a difference between the average returns of the turn of the month and the average returns of the rest of the month.
  
- Ho: There is no difference between the average returns of the month of January and the average returns of the other remaining months of the year.
- Ha: There a difference between the average returns of the month of January and the average returns of the other remaining months of the year.

The remaining part of the research is organized into additional seven main chapters. The second chapter includes different reviews in the literature, concepts and terms and a summary of comments and criticism. The third chapter includes an introduction of the efficient market hypothesis. The fourth chapter covers a background of the five emerging markets used in the study. The fifth chapter includes the methodology applied in the research that covers both sampling and analytical tools. The sixth chapter covers the discussion of the analysis in details. Chapters seven and eight include the findings of the research along with recommendations and the conclusion, respectively. References and appendices follow the conclusion.

# **CHAPTER 2**

# **LITERATURE REVIEW**

## **Chapter 2: Literature Review**

This chapter is categorized into three major sections: concepts and terms, literature reviews and summary of literature reviews, comments and criticism.

### **2.1 Concepts and Terms**

Below is a list of the concepts and terms that will show up in the next sections:

- GARCH stands for Generalized AutoRegressive Conditional Heteroskedasticity. A model used to help forecast inflation, stock and other security volatility using historical prices. (InvestorWords, 2013)
- Calendar anomalies are cyclical patterns found in stock average returns that have seasonal affects and are based on the calendar. (Karz, 2010)
- Turn-of-the-month anomaly: A change in share prices during the turn of the month period. Share prices have been experiencing higher returns around this period. (Karz, 2010)
- January effect: The tendency of share prices to pick up in the month of January, that results in high average returns compared with the other remaining months of the year. (InvestorWords, 2013)

### **2.2 Literature Review**

There has been a rising trend of exploring and testing different types of models, statistical tools and market calendar anomalies to examine how effective they might be in predicting stock returns. Identifying specific patterns has been another goal for many researchers as they would assist in forecasting future prices and, thus, making sound decisions and profits.

Some searchers use a single model or approach, whereas others apply a combination of sophisticated and complex approaches and econometric models to forecast stock returns. These approaches and models include (1) macroeconomic factors, such as CPI, real GDP, Commodity

Price Index and S&P 500 Index; (2) technical analysis, such as moving averages (MAs) and relative strength index (RSI); (3) statistical and econometric models, such as GARCH and EGARCH models, (4) web-based sentiments indicators, business cycles; volatility forecasting models, such as extreme value indicators; (5) time series models, such as EWMA; and (6) calendar-based anomalies like the January effect. Though different models are applied, it has been found that there is no superior model that would outperform other models. Also, researchers have developed similar quantitative forecasting methods with various degrees of accuracy using large sample and normal distribution that are not available for short-term prediction.

The existence of calendar-based anomalies has attracted a considerable number of individual local and foreign investors, funds managers and academicians for more than two decades. Financial market anomalies are one of the phenomena that have been found profitable in many emerging and major financial markets, rejecting the efficient market hypothesis and the random walk theory. Thus, the existence of calendar anomalies suggests the presence of a global phenomenon. Researchers have been growing since late 1980s to examine different calendar anomalies in which most found to be existing in different markets though a few found to be very weak, and thus, supporting the efficient market hypothesis. There are different types of calendar anomalies that have been examined and re-tested, with various valuable explanations, during the last two decades and across different international markets. Market calendar anomalies cover the turn of the year, the January effect, the week-end effect, the day of the week and the turn of the month.

This part attempts to make an extensive review in the literature on various financial market calendar-based anomalies in both major and emerging stock markets. It also looks at attempts to examine calendar anomalies in bond markets. It first explores different literature reviews of different calendar anomalies that cover a variety of data samples and periods of remarkable researchers and scholars in the field of market anomalies. Then, the review shifts to explore main findings in studies conducted to examine the January effect, followed by valuable reviews on the turn-of-the-month anomaly. This section is followed by a summary of the literature reviews, comments and criticism.

Evidence of financial market calendar-based anomalies has been found in many stock markets across the world, in both major and emerging markets. Al-Saad and Moosa (2005) search for existence of possible seasonality that would spot attractive excess returns for GCC stock market participants. The results reveal that seasonality does exist in the monthly stock average returns of Kuwait Stock Exchange index. They also find seasonality similar to January effect, which is a July effect.

It has been noticed that the emerging market of Athens Stock Exchange (ASE) has been going into a fast transition as a result of the economic integration with the European Union. Al-Khazali, Koumanakos and Pyun (2008) study calendar anomalies in the Greek stock markets, from 1985 to 2004. The authors find evidence of a strong “day” anomaly, but weak evidence of week and January anomalies. Their statistical tests show low significance levels of the last two anomalies compared to the other results reported in earlier studies by many researchers.

Bepari and Mollik (2009) examine the existence of the monthly stock average returns in Dhaka Stock Exchange (DSE) from 1993 to 2006. The authors use a model based on regression-time series. The results prove the existence of monthly anomaly in stock returns in DSE, leading to reject the efficient market hypothesis.

The findings of Bley and Saad (2010) are among those who find evidence of calendar anomalies. Their research studies daily stock market index and stocks returns across the GCC economies. They aim to look for investment opportunities in trading possible calendar anomalies that many major and emerging stock markets have been experiencing. After analyzing the data for the holiday effect, the day-of-the-week anomaly and the month-of-the-year effect, the researchers find evidence of the day-of-the-week effect in the majority of the GCC stock markets. However, they find no evidence of the holiday effect and the month-of-the-year anomaly as found in other stock markets around the world. They also find the existence of the holiday effect depends on religions and the cultures.

In a recent study, similar to the previous sample, Ariss, Rezvanian and Mehdian (2011) study the calendar anomalies of the day-of-the-week as well as the month-of-the-year in the GCC stock

markets. Their daily data covers all GCC stock market indices from the start of the market till 2008. Their findings prove evidence “Wednesday effect” and December effect. The Wednesday anomaly is similar to Friday effect as it used to be the last trading day of the week, especially on those Wednesdays that fall on non-Ramadan days. Their statistical results also show that the excess returns generated in December are similar to those of January effect found in the Western economies. The authors explain that the Wednesday anomaly exists because of investors’ purchasing mood prior to the weekend especially because short selling and derivatives trading are not available in the region. Similar assumptions are made on December effect. The authors also note a low volatility and falling stock returns during Ramadan due to contraction in economic activities during the month as well as a decrease in securities trading and speculation. Thus, the findings provide evidence that such calendar anomalies do exist in GCC stock markets.

Bley (2011) also examines the weak-form of efficient market hypothesis in GCC stock markets from 2000 to 2009. His study uses daily, weekly and monthly index data. His results show evidence of excess returns, which lead to reject the random walk. The author assumes that external investors might have had a significant role in the returns and the existence of calendar anomalies.

Believing in the theory that states “as goes January, so goes the year”, several investment managers and market participants rely heavily on the month of January for abnormal returns that is well-known for the January effect. The evidence of January effect is found earlier by Gultekin and Gultekin (1983) and Rozeff and Kinney (1976), where the average returns are found significantly higher in January compared with the other remaining months.

Looking for a possibility of existing January effect along with other calendar anomalies in early studies, Jaffe and Westerfield (1985) examine several foreign countries and find evidence of monthly effect. Extending researches on the week-end and monthly effects, Boudreaux (1995) investigates the stock markets of eight countries; Denmark, Switzerland, Germany, Norway, France, Spain, Singapore and Malaysia. He finds the presence of the month-end effect in the Danish, Norwegian and German stock markets. January effect is also found to be significant. However, negative returns are found in stock markets of Singapore and Malaysia.

On the other hand, Raj and Thurston (1994) find no evidence of the January and April effects in the stock market of New Zealand as the financial year in New Zealand ends in March. The researchers explain that the small size of the market and its poor liquidity are the main reasons for not finding the anomaly in the market.

Later on, Gu (2003) finds that in the US stock markets, the January anomaly is more prominent though the calendar effects are generally declining.

Moreover, introducing a new January effect type, Brown and Luo (2004) use data from NYSE stock index, from 1941 to 2002. They examine the predictability power of January returns to forecast value for future stock excess returns. They also examine the signs of other existing calendar months to predict the coming one-year returns. Their findings confirm the January effect.

Using data from Chinese stock markets, Doran, Jiang and Peterson (2008), however, find that Chinese stock markets do not generate high returns in January. Instead, high average returns are observed over the turn of the Chinese New Year.

The turn-of-the-month anomaly has also attracted many market participants and researches. Lakonishok and Smidt (1988) study the anomaly in Dow Jones Industrial Average (DJIA) using an event window or a turn-of-the-month period of (-1, +3); the last working day of previous month and first three days of next month. Their study includes data of a 90-year period from January, 1897 through June, 1986. After considering methodology testing issues, the authors find evidence of persistently abnormal returns around the turn of the month along with other anomalies, such as the turn of the year and around holidays.

Kunkel and Compton (1998) also examine the turn-of-the-month effect and find evidence of this anomaly. They apply the knowledge of this effect on two stock market indices: the Dow Jones Industrial Average and Standard & Poor's 500 Index, from 1988 through 1997 of four sample periods. They evaluate returns resulted from switching trading strategies as well as the returns

for the buy-and-hold strategy, using daily closing prices for the stock account and money market account. They also re-test the evidence of monthly anomaly found earlier. The authors find significant evidence of the turn-of-the-month anomaly. They recommend investors to shift in their strategies to enhance performance of the risk-adjusted of their retirement accounts. Their findings reveal that shifting to the turn-of-the-month anomaly and switching between a money market account and a market share account generate an average annual return of 17.7 per cent. This return is compared to an average annual return of a 15.6 per cent made by just buying and holding the stock account, or an average return of 5.8 per cent made on the money market account. Moreover, the switching strategy recommended above, has neither tax implications nor transactions fees, which made it more attractive and worth implementing it.

Another calendar anomaly that has attracted researchers is the turn-of-the-month anomaly. To examine the turn-of-the-month anomaly, different researchers have applied various event windows. Ariel (1984) is among the first researchers to recognize the monthly anomaly in US stock prices. His research studies a four-day event window: the last day of the month and the first three days of the next month. His results confirm positive average returns on these days. He finds positive mean return only for days preceding and during the first half of months. During the years from 1963 to 1981, all of the market's returns accumulate just before and during the first half of the months; however, the last half contributes almost zero to the cumulative increase.

Applying a different approach of identifying the turn-of-the-month anomaly, Kohers and Patel (1999) examine daily average returns of the "time-of-the-month" anomaly in Standard and Poor's as well as NASDAQ indices, for period 1960-1995 and 1972-1995, respectively. They divide the whole month into three segments. They find that the highest stock returns are generated in the first segment; whereas, the second and the third segments reveal decreasing and low to negative returns in the second and third segments, respectively, in most cases. These results are significantly consistent for the two indices including similar business cycles and sub-periods.

Kunkel, Compton and Beyer (2003) examine a bigger sample of daily returns of 19 stock indices in 19 different countries. Surprisingly, the authors find evidence of the turn-of-the-month analysis in the 15 countries. They authors use parametric and nonparametric tests to address

issues regarding methodologies used in previous anomalies researches. The authors find that, on average and across the 19 countries, the 4-day window event of the turn of the month accounts for 87 per cent of the monthly average return. The findings are considered significant because these 19 countries make 77 per cent of capitalization value of foreign markets. Moreover,

McConnell and Xu (2006) also study the effect of the turn of the month in equity returns, but in two different ways. They examine whether the anomaly exists more in specific industries or certain time periods especially those associated with significant investor sentiment. Then, they investigate the profitability of using the anomaly as a trading strategy after deducting trading costs. The study examines the daily returns of market indices that have value-weighted as well as equal-weighted, from 1926 to 2005. The findings reveal that the turn-of-the-month anomaly is not restricted to stocks with both low and high prices. The anomaly is not limited to the US financial markets either. On average, the findings show that all the positive returns are made over the turn-of-the-month period.

Extending previous researches, Reschenhofer (2010) tests the turn-of-the-month anomaly using daily average returns of the S&P 500 index from 1952 to 2010. His data covers 18 days of each month; the returns of the first nine days and the returns of the last nine days in the month. The findings reveal clear evidence for patterns found within the month in daily average returns on the S&P 500 index, supporting earlier results found by simply comparing various days of the month to identify any presence of the anomaly.

Moving to emerging markets, Chandra (2011) examines the existence of turn-of-the-month effect as well as the time-of-the-month anomaly using the daily SENSEX data, the capital index of Bombay Stock Exchange (BSE). The data covers the period from April, 1998 to March, 2008. She assesses the stock returns throughout the month through dividing the month into three segments and analyzes the returns within the sections to identify which segment shows more returns. The results show strong evidence of the anomaly in BSE 30. The findings show significant equal returns for both effects. Also, the results show that the first part section of the month experience higher average returns than the last segment. This result is in line with the previous study conducted by Reschenhofer (2010).

Razvan and Romana (2011) also examine the existence of the turn-of-the-month anomaly in the emerging market of Bucharest Stock Exchange. They use daily prices of the two major indices of the Romanian capital market; BET-C for BET market and RAQC for RASDAQ market. Their samples cover the period from 2002 to 2011. They include both stock prices of some of the biggest Romanian companies as well as the stock prices of smaller companies. They authors find evidence of the turn-of-the-month anomaly only in the BET market. On the other hand, RASDAQ includes small companies that are not quite attractive for the foreign market participants. Besides, the impact of the foreign capital markets is much less compared with BET market.

Other researchers have examined the turn-of-the-month anomaly in association with US macroeconomic announcements. Nikkinen and Sahlström (2004) examine if market participants in European stock markets account for domestic and US macroeconomic news releases when taking trading decisions. To assess the news impact, the authors analyze the impact of volatilities on the Finnish and German markets. They find US employment report and the Federal Open Market Committee (FOMC) meeting days have a great impact on both European stock markets. In contrast, the domestic news announcements are found to be of no impact on both markets' volatility. Thus, the findings show that the US macroeconomic news are considered valuable information sources on the German and Finnish stock markets, whereas domestic news has low impact.

The findings of Gerlach (2007) are also support the previous study though the research type is slightly different. He examines six stock market calendars as well as weather anomalies for the period from 1980 to 2003. The results reveal that high returns are generated on the days in which the macroeconomic announcements are released. Moreover, the results show that five out of six anomalies do not exist on the days in which such news was not announced Thus, the findings suggest that macroeconomic news is the main driver of the stock market calendar anomalies.

Nikkinen, Sahlström and Takko (2009) extend the literature and test the evidence of the turn-of-the-month as well as the intra-month anomalies found earlier by other researchers in the US

stock market and in major European stock markets. The earlier findings suggest that these anomalies take place due to important US macroeconomic news that is released around the turn of the month. Their research is conducted mainly to identify major turn-of-the-month and intra-month anomalies, and to examine whether these effects occur because of the clustered macroeconomic news announcements of the US. Given the nature of the current global markets and the need to be further connected and integrated, the authors assume that the main US macroeconomic news are considered a key factor causing the turn-of-the-month as well as the intra-month anomalies in the thin, traded, developed Finnish stock market. Their data sample includes a seven-year period from January, 2001 through December, 2007; a total of 1,760 trading days. The findings reveal that both anomalies exist; however, the anomalies disappear after controlling for the impact of the US news announcements. This leads to the other findings that show the significant impact of clustered US macroeconomic news on the Finnish stock market.

Following two approaches of French (1998) and Connolly (1989), Nippani and Arize (2007) find mixed results.

Recent studies on the correlation between macroeconomic news announcements and stock market anomalies show how interested researchers are exploring and re-testing existing positive results. Gerlach (2007) tests the impact of US and UK news announcements on two stock market indices in both countries. The sample covers a 1980-2007 period. The research examines four stock market anomalies: “the January effect, the day-of-the-week effect, the turn-of-the month effect and the Halloween effect”. The results reveal that macroeconomic news announcements have little to no influence on stock market calendar anomalies in the US and the UK stock markets. This is not in line with the other findings.

Calendar anomalies have also been observed in the bond markets. Early studies on anomalies do not only examine stock markets, but also the bond markets. Calendar-based anomalies have driven researches toward the bond markets as well. There are many major reasons why bond markets and indices have been attracting both investors and academicians since early 1990s. Significant increase in the pension funds and individuals trading is the main reason; the

increasing popularity of bond index funds and a close study of their performance by many market participants is the second reason. Also, it has been expected that there would be a substantial increase in the number of researches associated with the bond market (Reilly, Kao and Wright, 1992). Nowadays, the number of bond market instruments has increased significantly along with the researches, meeting earlier expectations of how this market would grow and keep attracting interest by all types of market participants.

Going back to early studies on corporate bond markets, using a data sample from 1963 to 1986, Jordan and Jordan (1991) find evidence of January effect as well as the turn-of-the-year as well as the week-of-the-month effects; however, the day-of-the-week and the turn-of-the-month anomalies are not observed.

Recent studies have applied different approaches and strategies to test any possibility of calendar effects in the bond markets. As the initial research conducted and based on industry classes, Nippani and Arize (2007) study three main US corporate bond market indices over a twenty-year period from 1982 to 2002. The study examines the corporate bond market as well as two major industry classes of industrials and utilities. The findings reveal mixed results; following French (1998) model, Monday returns are found insignificant. Monday returns, however, are found considerably low compared with the average returns of the rest of the week, applying the Connolly (1989) model. These findings do not support the results found by Jordan and Jordan (1991); applying data prior to 1968, the authors find no day-of-the-week anomaly. Nippani and Arize (2007) believe that the main reason is the change in the type of equity markets and their influence on the bond markets. This is mainly because market participants keep adjusting their positions across the markets, due to risk-on and risk-off sentiments. The authors also find evidence of the turn-of-the-year effect, which supports the results revealed by the earlier studies of Jordan and Jordan (1991). Moreover, compared to the composite and industrial indices, the researchers find weak evidence of the turn-of-the-year effect in the utilities index. Another interesting observation is that the day-of-the-week effect seems to relate to the week-of-the-month anomaly in the period preceding 1988 in two of the bond indices. This is different from the results found by Jordan and Jordan (1991). The last major finding in the study is the existence of the January effect, particularly in DJBD and DJBID.

## 2.3 Summary and Criticism

As observed in the existing literature, old and recent, there is a wide range of approaches that have been applied to examine financial market calendar-based anomalies in both emerging and major stock markets along with certain bond markets. To recap, some researchers study a particular calendar anomaly, whereas others examine a combination of different anomalies using different event windows, periods and samples. Other researchers incorporate other factors that would impact the results, such as macroeconomic news and its impact around the time when the anomalies take place.

Researchers find evidence of different calendar anomalies. Jaffe and Westerfield (1985) examine several foreign countries and find evidence of monthly effect. Boudreaux (1995) investigates the stock markets of eight countries and finds the presence of the month-end anomaly in the Danish, Norwegian and German markets. Lakonishok and Smidt (1988) discover evidence of abnormal returns around the turn of the year and around holidays in Dow Jones Industrial Average (DJIA). In emerging markets, Al-Saad and Moosa (2005) find out that seasonality does exist in the monthly stock average returns in Kuwait Stock Exchange index. They also find seasonality similar to the January effect that is a July effect. Al-Khazali, Koumanakos and Pyun (2008) find evidence of a strong “day” anomaly. Bepari and Mollik (2009) also confirm the presence of the monthly anomaly in stock returns in Dhaka Stock Exchange. The results show that an “April effect” is present in DSE. Moving back to the GCC region, evidence of the day-of-the-week effect in the majority of the GCC stock markets is also found by Bley and Saad (2010). Ariss, Rezvanian and Mehdian (2011) find evidence of “Wednesday effect”, similar to Friday effect and December effect in GCC countries. Similarly, Bley (2011) shows evidence of excess returns in GCC stock markets.

January effect has been found very common in the financial markets. The evidence of January effect is found earlier by Gultekin and Gultekin (1983) and Rozeff and Kinney (1976), where the average stock returns are found higher in January compared to the average returns of the rest of the months. Boudreaux (1995) finds January effect in Denmark, Switzerland, Germany, Norway, France and Spain. Gu (2003) finds the January effect in the US stock markets though generally

declining. Findings of Brown and Luo (2004) also confirm the January effect in the NYSE equal weighted stock index. Using data from Chinese stock markets, Doran, Jiang and Peterson (2008) also find a similar anomaly effect over the Chinese New Year.

Strong presence of the turn-of-the-month anomaly has also been found in many financial markets. Ariel (1984) is among the first researchers to recognize the turn-of-the-month anomaly in US share prices. He finds positive mean returns only for the days preceding and during the first two weeks of the months. Lakonishok and Smidt (1988) discover evidence of abnormal returns around the turn of the month in Dow Jones Industrial Average (DJIA). Kunkel and Compton (1998) find this anomaly in both the DJIA and Standard & Poor's 500 Index. Kohers and Patel (1999) also find the highest stock returns are generated in the first segment of Standard and Poor's and NASDAQ indices, confirming Ariel's findings.

Recent studies support the previous findings as well. Examining a large sample of 19 stock indices in different countries, Kunkel, Compton and Beyer (2003) find that the 4-day window event of the turn of the month accounts for 87 per cent of the monthly average return. This result is considered significant because these 19 countries make 77 per cent of capitalization value of foreign markets. The findings of McConnell and Xu (2006) reveal that all the positive returns are made over the turn-of-the-month period. Supporting earlier results, Reschenhofer (2010) finds clear evidence for patterns found within the month in daily average returns in the S&P 500 index.

Emerging markets have also experienced the turn-of-the-month anomaly. Chandra (2011) examines existence of turn-of-the-month effect as well as the time-of-the-month effect in SENSEX. The findings show significant returns for both effects. Also, the results show that the first section of the month experience higher average returns compared with than the last segment of the month. This is in line with the results found by Ariel (1984), Kohers and Patel (1999) and Reschenhofer (2010) in the US stock markets. Stefanescu and Dumitriu (2011) also examine the presence of the turn-of-the-month anomaly in the emerging market of Bucharest Stock Exchange. They find evidences of the anomaly in the BET market where foreign investors play a major role.

Exploring other drivers that could impact the turn-of-the-month anomaly or other calendar effects, researchers have started to examine the anomaly at the time when domestic and international macroeconomic data is released. Nikkinen and Sahlström (2004) examine if market participants in European stock markets account for domestic and US macroeconomic news releases when taking trading decisions. They find that US employment report and the FOMC meeting days do have a significant impact on both Finnish and German stock markets, whereas domestic news is found of no impact. Findings of Gerlach (2007) also reveal high returns on the days in which macroeconomic news is announced. Moreover, the results show that most anomalies do not exist on the days in which such announcements are not released. After examining the turn-of-the-month as well as the intra-month anomalies, Nikkinen, Sahlström and Takko (2009) find evidence of both anomalies; however, they disappear after controlling for the impact of the US news announcements.

Bond markets have also gained a lot of growing attention. Jordan and Jordan (1991) find evidence of January effect as well as the turn-of-the-year and the week-of-the-month effects. The turn-of-the-year effect is also found in bond markets; Nippani and Arize (2007) find this anomaly in three main US corporate bond markets, supporting earlier studies of Jordan and Jordan (1991). The findings also reveal that the day-of-the-week anomaly seems to have a correlation with the week-of-the-month effect in the period preceding 1988 in two bond indices.

On the other hand, some findings reveal weak or no evidence of the calendar anomalies found by others in the literature above. Raj and Thurston (1994) find no evidence of the January and April effects in the stock market of New Zealand. Boudreaux (1995) find negative returns in stock markets of Singapore and Malaysia. Having examined the impact of US and UK macroeconomic news data on anomalies, Gerlach (2007) finds that macroeconomic news announcements have little to no influence on stock market calendar anomalies. This is not in line with the other findings. Al-Khazali, Koumanakos and Pyun (2008) find weak evidence of week and January anomalies in the Greek stock markets. Bley and Saad (2010) find no presence of the month-of-the-year and January effect in the GCC countries. Razvan and Romana (2011) find no evidence of the turn-of-the-month anomaly in NASDAQ. Moving to the bonds markets, Jordan and Jordan

(1991) finds no evidence of the day-of-the-week and the turn-of-the-month anomalies. Nippani and Arize (2007) study three main US corporate bond market indices over a twenty-year period, but find no day-of-the-week anomaly. Moreover, compared with the composite and industrial indices, the authors find weak evidence of the turn-of-the-year anomaly in the utilities index.

Having examined calendar-based anomalies in different major and emerging stock markets as well as bond markets, findings are still not in line with each other. In my point of view, micro- and macro-economic drivers can be the main causes of these anomalies that vary from one economy to another. First, the number of firms that form an index and announce profits during the first week or two weeks can play an important role in terms of their weightage in the index compared with other firms; this could explain why such anomalies exist in one market, while disappear in another. Second, stronger purchasing power that results from receiving salaries could be a key factor in causing the end-of-the month effect. Third, the pension funds are also very active over the turn-of-the-month event window; this could also explain the excess returns made over this window. Fourth, some markets experience low volatility that weakens the effect, such as Ramadan effect especially in GCC region where securities trading and speculation decrease. Fifth, the business cycles, bearish or bullish, can also play a major role in finding anomalies in markets. Sixth, political changes and changes in policies can also affect the overall findings. Seventh, impact of international macroeconomic data do influence stock returns though not at the same degrees. Other factors could be dependencies on other economies as found by Nikkinen and Sahlström (2004). Moreover, maturity and liquidity should be considered when selecting and examining markets. This explains why such markets do not experience calendar anomalies as found by Boudreaux (1995) in Singapore and Malaysia.

I think these are some of the key factors that need to be considered in future studies when examining calendar anomalies in financial markets. Psychology of market participants has changed over the last decade; financial markets have gone through major recessions and corrections that need to be accounted for carefully in future researches. What might have worked for a considerable period of time, might fail to work in other business environment, especially when investors' confidence remain the key factor to observe major changes. Future studies are recommended to be conducted using recent data. Including the last two bullish and bearish

cycles in different financial markets across different regions shall provide further insight into the dynamics behind the existence of such calendar anomalies. This would add value to the existing valuable literature that either supports or rejects the efficient market hypothesis.

This research considers a lot of the factors above that are applicable to the emerging markets. Given the uncertainty in the Euro Zone and the US economies, the current trend and attention are more into finding profitable opportunities in those emerging economies.

# **CHAPTER 3**

# **EFFICIENT MARKET**

# **HYPOTHESIS**

## **Chapter 3: Efficient Market Hypothesis**

Efficient Market Hypothesis is an assumption that was developed at the end of 1960s by Fama. In his paper, Fama (1970) describes an efficient market as “security prices always fully reflect the available information.” This means if the assumption the Efficient Market Hypothesis is correct, the market knows best at all time. In other words, investors particularly the arbitrageurs who are seeking risk free profit can't determine any asset that is incorrectly priced in that market simply because the market prices adjust to the new information almost instantaneously. The hypothesis states that identifying patterns, forecasting future prices and making sound profits are not possible in advanced markets and the only way to make higher profit is to bear more risk (Szyszka, 2008).

Fama (1970) defines three various degrees of market efficiency: the weak form, the semi-strong form and the strong form. The weak form assumes that share prices fully reflect all the share information at all times, including historical data, returns and volumes traded. Since the present market price reflects all the historical data of the share or stock, this form of market efficiency entails that historical returns have no relation or connection with future data. Therefore, the future data of returns must be independent. This implies that market participants cannot use historical data, particularly technical analysis, in their trading rules to make excess returns.

The semi-strong form presumes that share prices reflect all accessible public information. Beside the available public information of historical data, this form suggests that even the non-market information, such as accounting ratios, dividend announcements and earnings, cannot enable market participants to make excess returns. The same reason applies here as well; all the public and private information is discounted in the current share price.

The strong form of the EMH presumes that share prices reflect all available public and private information. As a result, no investors have access to confidential information that will allow them to use and consistently make abnormal returns. Similar to the previous reason in the previous forms, the main reason why investors cannot trade private information is because all the

public and private information is accounted for in the current stock price. Thus, the strong form covers both the weak form and the semi-strong Form; it presumes that stock prices adjust quickly to any new announcement of public information that is available to all people at the same time.

Some statisticians declare that "a theory is just a theory" is not a fact. This theory has been tested and discussed further by different researchers. The different arguments that are against and in favor of the Efficient Market Hypothesis have been always controversial.

**CHAPTER 4**  
**BACKGROUND OF THE**  
**FIVE EMERGING**  
**MARKETS**

## **Chapter 4: Background of the Five Emerging Markets**

This chapter provides a brief background of the five major emerging market indices that are used in the analysis.

### **4.1 S&P CNX Nifty**

The S&P CNX Nifty is a very well-diversified Indian index that includes 50 stocks which represent 22 multiple sectors of the Indian economy. CNX Nifty is used for different purposes, but mainly as a benchmark for fund portfolios as well as index funds.

S&P CNX Nifty is possessed and supervised by India Index Services and Products Ltd. (IISL), a venture that is managed jointly by NSE and CRISIL. IISL is considered India's first specialized firm that concentrates on the index as a main product. Moreover, IISL has a marketing and licensing treaty with the world leading index services provider, Standard & Poor's (S&P). As on September 28, 2012, the S&P CNX Nifty Index accounts for around 67 per cent of the shares that are listed on NSE. The total traded value of all index components during the last six months ending in September 12, mount to around 55 per cent of the traded total shares listed on NSE. The S&P CNX Nifty has also been professionally managed and is considered ideal for derivatives trading. (National Stock Exchange of India, 2012)

### **4.2 Russian Trading System Stock Exchange**

Russian Trading System Stock Exchange was established in 1995. RTS Stock Exchange is currently trading the full range of financial instruments. It is considered a benchmark for the securities industry in Russia. It comprises of 50 most liquid and capitalized stocks.

Russian Trading System includes 1) RTS Standard, a new equity market Russian liquid securities; 2) RTS Classica, a trading platform of more than 500 securities, which permits settlement in rubles and foreign currency; 3) RTS T+0 Market, securities settled in ruble; 4) RTS Board, a quote-driven market for unlisted shares and bonds; and 4) FORTS, a financial market for futures and options, settled in ruble.

There are major international members that are part of RTS; they include UBS, Deutsche Bank, and Morgan Stanley, with key shareholders of global investment banks, such as UBS, Credit Suisse and Deutsche Bank. (Russian Trading System Stock Exchange, 2012)

### **4.3 Shanghai Stock Exchange (SSE)**

Shanghai Stock Exchange (SSE) was established in 1990 and started operating on 19 December, the same year. It is overseen by China Securities Regulatory Commission (CSRC). The SSE has been developing based on high principles, such as "legislation, supervision, self-regulation and standardization" to form a transparent and a secured marketplace. The SSE runs a variety of activities. It provides the marketplace with facilities for securities trading; it creates and develops business rules and regulations to control members and listed firms, and evaluates firms and accepts listings.

The SSE has become the most efficient stock market in China. The number of listed firms and shares has all played major roles in making it a preeminent financial market. A big number of firms from core industries has helped raising capital and enhancing their operation systems all the way through listing on Shanghai stock exchange market.

As of December-end in 2007, the SSE had around 860 listed companies. In 2007, the capital raised from the SSE market exceeded RMB 661.6 billion. (Shanghai Stock Exchange (SSE), 2012)

### **4.4 Bovespa Index – Ibovespa**

Moving to South America, the Bovespa Index is considered a benchmark for the Brazilian stock market. The Ibovespa's importance comes from two facts: first, it reflects the variation of BOVESPA's most traded stocks; second, it maintains its historical sequences without any change in its methodology since its establishment in 1968.

BOVESPA Index represents the Brazilian current value of theoretical share portfolio established by hypothetical investments in 1968. Apart from the reinvestment of the distributed benefits, no more investment has been made since then. Therefore, the index reflects both the variation of the

share prices and the influence of the distribution of benefits. BOVESPA Index has become reliable average performance of major traded shares. (BOVESPA, 2012)

#### **4.5 FTSE/JSE Africa Index Series**

The FTSE/JSE Africa Index Series was established in 2002. It consists of 98 indices, used as a benchmark to create financial instruments and conduct market analysis. The series goes through regular quarterly revision: March, June, September and December, and is monitored by an advisory body. All the 98 indices are developed using methodologies similar to the ones used to develop FTSE index. The indices are classified into three main categories: headline indices, specialist indices and secondary market indices. “Headline indices include the FTSE/JSE Africa Top 40, FTSE/JSE All-Share and TSE/JSE Africa”. “Specialist indices include the FTSE/JSE Capped 40, FTSE/JSE Shareholder Weighted Indices, FTSE/JSE Style Indices, FTSE/JSE Preference Share Indices, FTSE/JSE Top 40 Dividend index and the FTSE/JSE Dividend+ Index”. “Secondary Market indices include the FTSE/JSE Africa Development Capital and the FTSE/JSE Africa Venture Capital Indices”.

# **CHAPTER 5**

# **METHODOLOGY**

**Chapter 5: Methodology**

This research attempts to examine either the presence or absence of turn-of-the-month anomaly as well as the January effect in the five major emerging market indices mentioned earlier. The index returns are calculated for the entire sample period. For each index, the turn-of-the-month returns are calculated independently from the rest of the month using a six-day event window. For the January effect, the average returns of the month of January and the average returns of the other remaining months are computed. The student t-test is used to examine the significance of the difference between the turn-of-the-month average returns and the rest-of-the-month average returns. It is also used to test the statistical difference of January returns and the rest of the months' average returns.

## **5.1 Sampling**

The data used in the methodology is daily closing prices of five major emerging stock indices. These indices include S&P CNX Nifty Index, RTS Russia Index, SSE Index, Bovespa Index and FTSE-JSE Index. They are major stock indices in India, Russia, China, Brazil and South Africa, respectively. The data covers a seven-year period, from 2005 to 2011. The data is collected from Yahoo Finance. This period has been selected because it experiences two trends: bullish and bearish. Also, the reason for selecting these major emerging market indices is the shift in investment strategy from investing in advanced markets to investing in emerging markets especially after the latest financial crisis. These markets represent golden investment opportunities for many funds and investment managers. I believe that this paper is among the few researches that cover more than three emerging markets with very recent data. Testing the turn-of-the-month anomaly and the January effect in these markets and providing evidence of existence or non-existence will surely benefit current investment managers as well as academicians to build on in the literature. The following section explains the analytical tools used to examine the turn-of-the-month anomaly, followed by the statistical tools used to test the January effect. It also includes a summary of data obtained and calculated, such as average returns and t test figures. This section is followed by results analysis of both the turn-of-the-month anomaly and the January effect.

## **5.2 Analytical Tools**

Based on the assumption concluded by Boudreaux (1995), it is assumed that the return on the five indices follows a random walk as in (1):

$$\text{Return}_t = \ln (\text{Index}_t / \text{Index}_{t-1}) = a + u_t \quad (1)$$

Where

$\text{Return}_t$  = continuously compounded rate of change in the market index

$\text{Index}_t$  = the stock market index at time  $t$

$a$  = a constant

$u_t$  = a normal random variable of zero as a mean.

After identifying the six-day event window for each stock index, the index's returns are computed as percent change in the index price, applying the following natural logarithm (LN):

$$R_{i,t} = \text{LN} (P_t / P_{t-1}) * 100 \quad (2)$$

Where

$R$  = returns of index  $i$  for day  $t$

LN = natural logarithm

$t$  = today's price

$t-1$  = today's price less yesterday's price

To calculate the turn-of-the-month average returns as in (3), that is the very last two days of the month and the first four days of the next month, and the rest-of-the-month average returns as in (4), two different returns are averaged, for each index, for seven years of 84 months, during the sampling period, using the two formulas below; (3) for the turn-of-the-month average returns and (4) for the rest-of-the-month average returns:

$$AR_{i,t} = \frac{\sum_{t=1}^N AR_{i,t} (\text{TOM})}{n} \quad (3)$$

Where

$t = -2, \dots, 0, \dots, +4$

$$AR_{i,t} = \frac{\sum_{t=1}^N AR_{i,t} (\text{ROM})}{n} \quad (4)$$

Where

$t =$  rest of the month

The outliers in the data have been dealt with in accordance with the normal statistical procedures. To test the first null hypothesis that the average returns of the turn of the month and the rest of the month are equal, the statistical student t test is used. The null hypothesis,  $H_0$ , assumes that both of the turn-of-the-month and the rest-of-the-month average returns are equal;  $H_0: t_1 = t_2$ . In other words, the average returns of the six days over the month are equal to the average returns of rest of the month. The t test is used to test the hypothesis and the statistical significance of the difference, at 5% significance level, as evidence to accept or reject the null hypothesis. The average returns of the turn of the month and the rest of the month are computed for each month of the year for seven years. To show the breakdown of the two different average returns of the turn of the month and the rest of the month, for each of the five indices, a summary of descriptive statistics is provided in Appendices (1-5). It is worth to mention that the data download of CNX Nifty Index does not include complete March data as it only includes 1<sup>st</sup>, 3<sup>rd</sup> and 5<sup>th</sup> closing data. Even Bloomberg does not have the data. Also, an accumulative turn-of-the-month average returns and the rest-of-the-month average returns are computed for each index is shown in the figures (1-5) below. Seven-year annual descriptive statistics of the five indices as part of the turn-of-the-month (TOM) analysis are provided in Appendix (6).

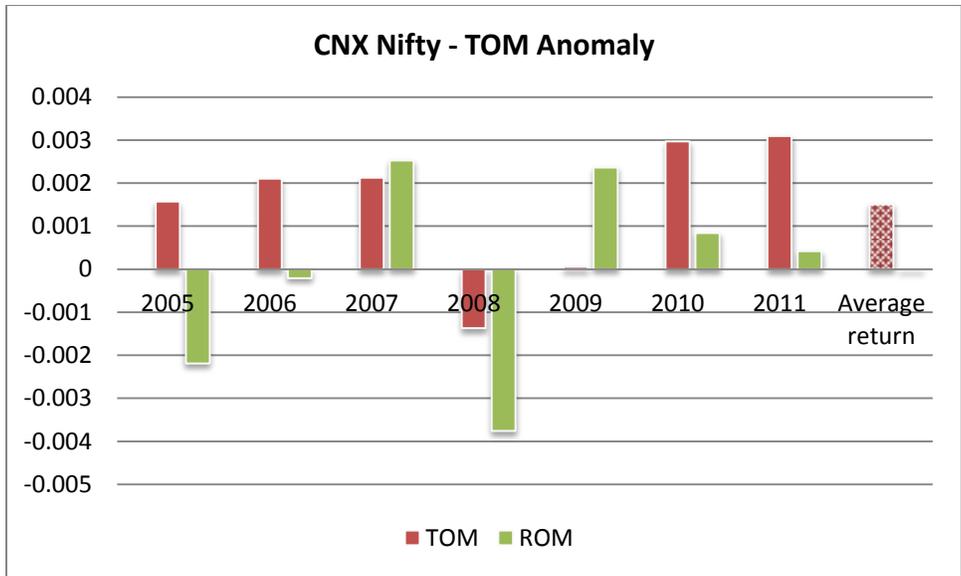


Figure 1 shows the average returns of the TOM and the average returns of the rest of the month (ROM) for S&P CNX Nifty Index

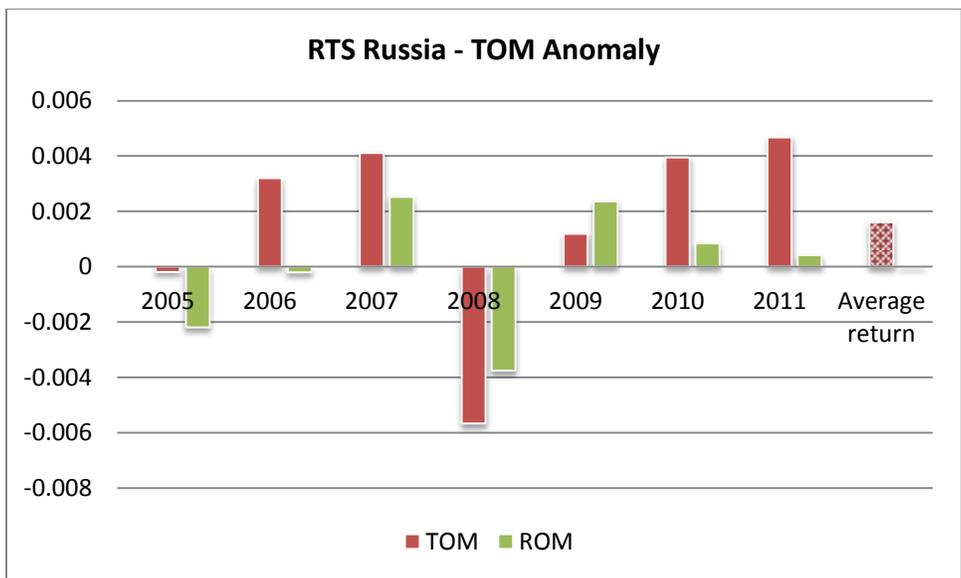


Figure 2 shows the average returns of the TOM and the average returns of the rest of the month (ROM) for RTS Russia Index

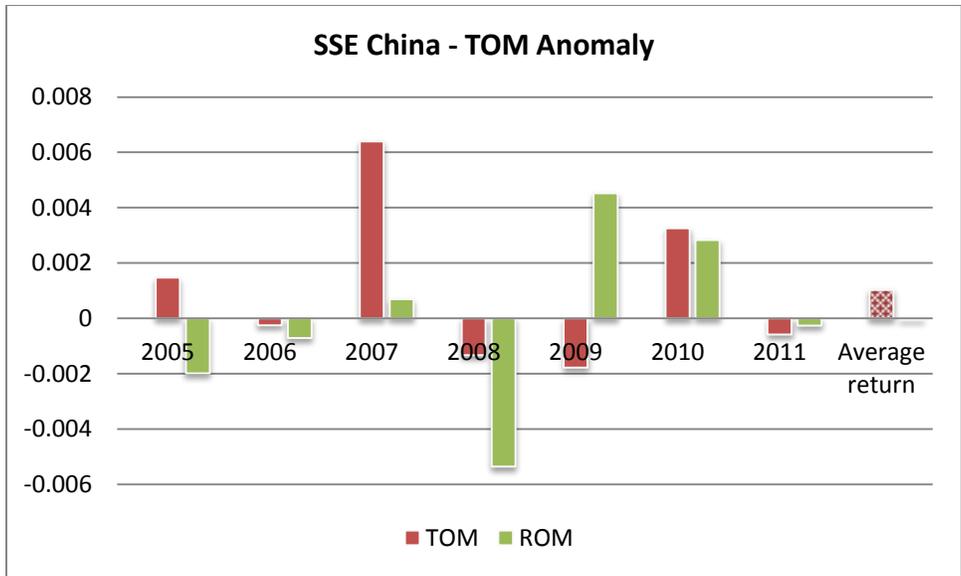


Figure 3 shows the average returns of the TOM and the average returns of the rest of the month (ROM) for SSE China Index

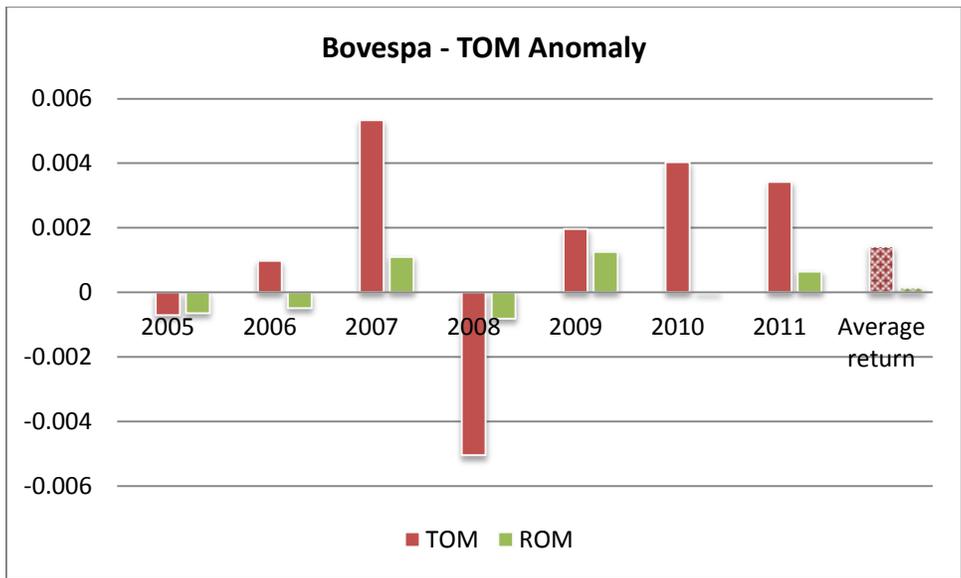


Figure 4 shows the average returns of the TOM and the average returns of the rest of the month (ROM) for Bovespa Index

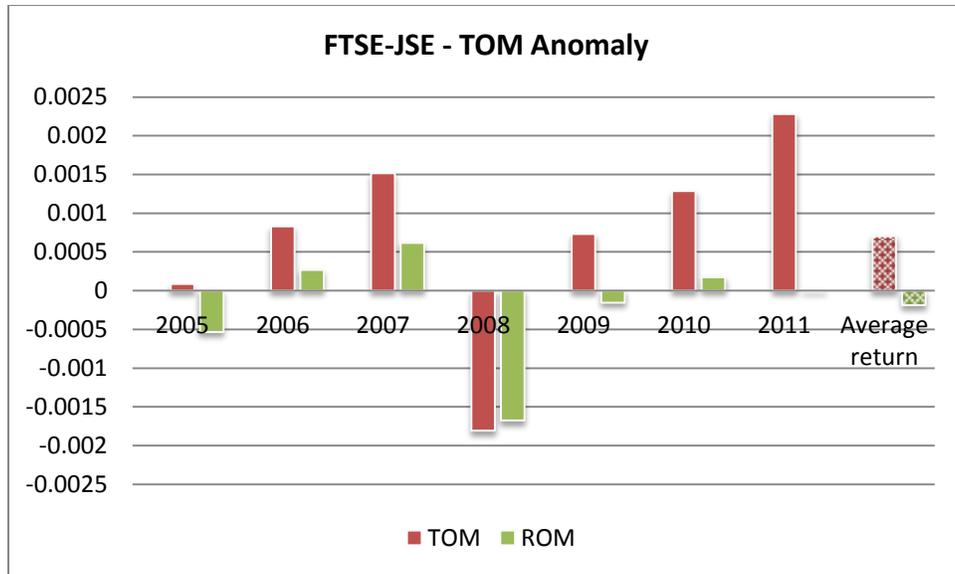


Figure 5 shows the average returns of the TOM and the average returns of the rest of the month (ROM) for FTSE-JSE Index

To examine the presence of the January effect in the same five indices, daily closing prices are used for the same sample period; the average returns of the month of January and the average returns of the other remaining months are calculated using formula (2). Following Haug and Hirschey(2005) approach, the computed average returns of the other remaining months are subtracted from January returns, for each year, as in (5) and (6):

$$AR_{i,t} = \frac{\sum_{t=1}^n AR_{i,t}(\text{Jan})}{n} \quad (5)$$

$$AR_{i,t} = \frac{\sum_{t=1}^n AR_{i,t}(\text{Other 11 months})}{n} \quad (6)$$

Where AR represents the average returns of index *i* for day *t*, for both the month of January as in (5) and the other 11 months as in (6).

The t test is also applied to test the second null hypothesis that assumes the average returns of the month of January and the other 11 months are equal. The null hypothesis, H<sub>0</sub>, assumes that the returns of both January and the other 11 months are equal, H<sub>0</sub>: t<sub>1</sub> = t<sub>2</sub>. The t test tests the

hypothesis and the statistical significance of the difference, at 5% significance level, as evidence to accept or reject the null hypothesis. Figures (6-10) summarize the January average returns and the average returns of the other remaining months. Appendix (7) shows a summary of descriptive statistics of examining the January effect in the five indices.

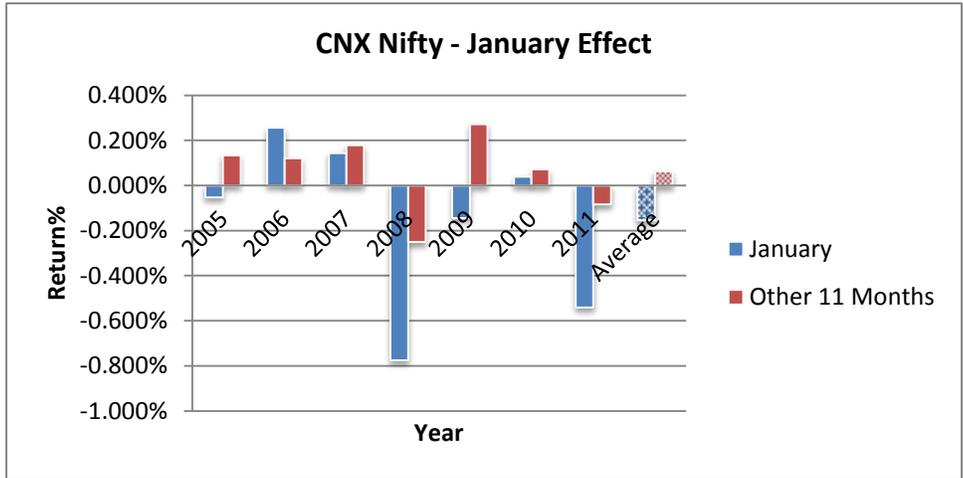


Figure 1 shows the average returns of the month of January and the average returns of other remaining months for S&P CNX Nifty Index

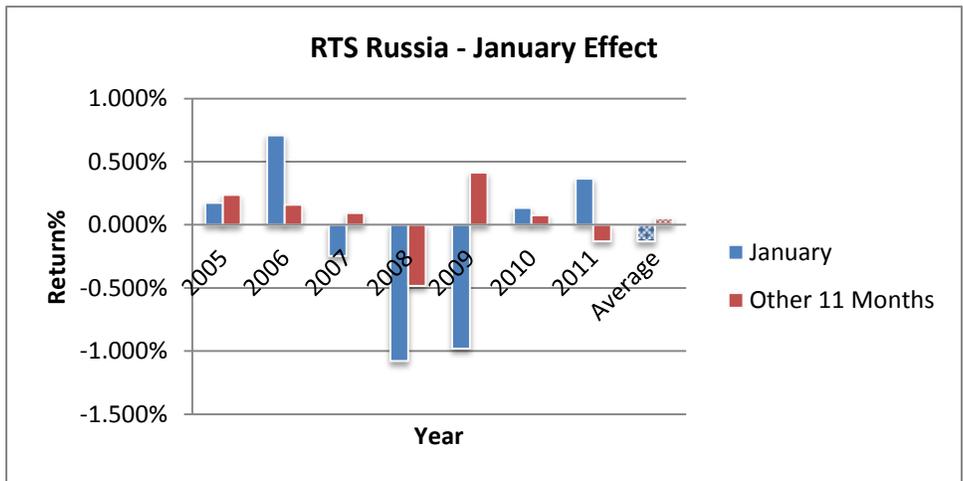


Figure 2 shows the average returns of the month of January and the average returns of other remaining months for RTS Russia Index

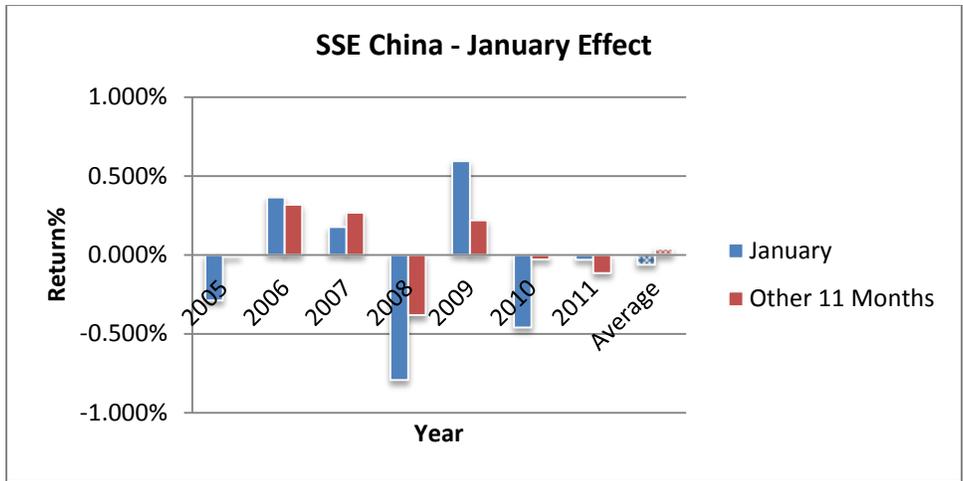


Figure 3 shows the average returns of the month of January and the average returns of other remaining months for SSE China Index

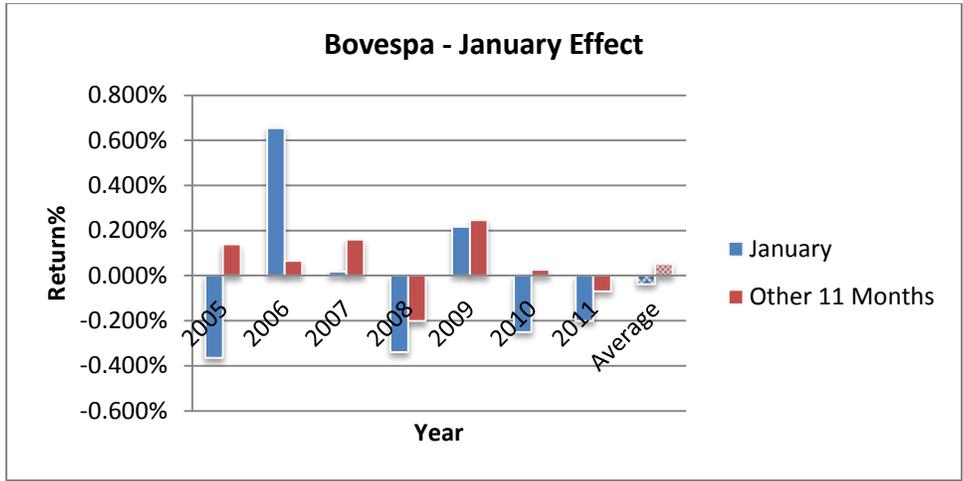


Figure 4 shows the average returns of the month of January and the average returns of other 11 months for Bovespa

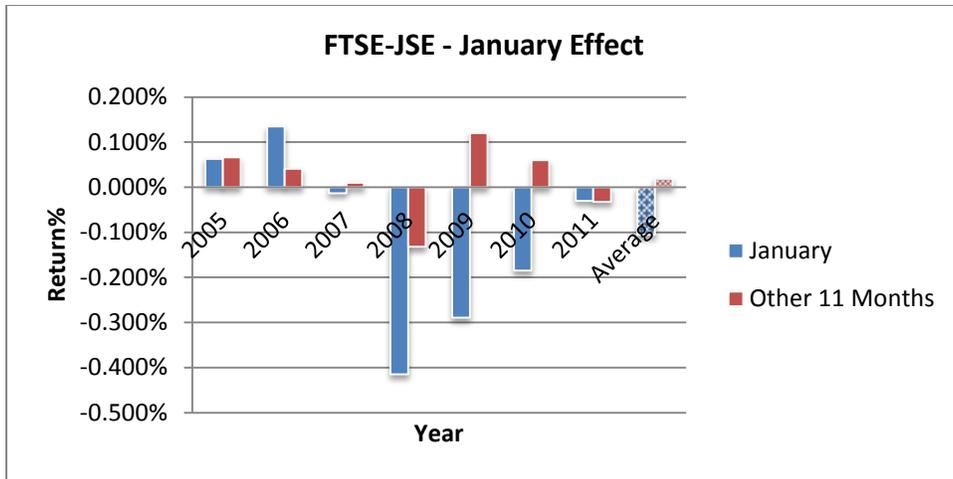


Figure 5 shows the average returns of the month of January and the average returns of other 11 months for FTSE-JSE Index

# CHAPTER 6

# RESULTS AND DISCUSSION

## **Chapter 6: Results and Discussion**

This chapter discusses first the results of examining the presence of the turn-of-the-month anomaly in stock market indices of five emerging economies: CNX Nifty, RTS Russia, SSE China, Bovespa and FTSE-JSE. Each index is analyzed in details for the period from 2007 to 2011. Then a comparison of yearly average returns between the turn of the month and the rest of the month of the five indices is made. After that, a detailed discussion of the January effect in the same economies is provided. This section will be followed by a summary of findings.

Having examined CNX Nifty index for the presence of the turn-of-the-month anomaly, different results have been found. In 2005, it is found, on average, that the average returns of the turn of the month are higher than the average returns of the rest of the month for six months. Having ordered the average returns of the turn of the month, from the highest to the lowest, February, March, April, September, July and September show higher returns compared with the rest of the month; that is, 1.017%, 0.736%, 0.703%, 0.636%, 0.442% and 0.346% against -0.078%, -0.468%, -0.446%, -0.421%, 0.267% and -0.075%, respectively. Having assumed a normal distribution, the two-sample student test is applied to test the null hypothesis that presumes mean returns of both the turn of the month and the rest of the month are equal. The t test shows a result of 0.149; this result shows that at 5% significance level which is 95% confidence level, the difference between the turn-of-the month average returns and the rest-of-the-month average returns is not statistically significant. A summary of the turn-of-the-month anomaly for CNX Nifty index from 2005 to 2011 is provided in Appendix (1).

In 2006, the results also show, on average, that the average returns of the turn of the month are higher than the rest of the month for eight months. sorting the average returns of the turn of the month, from the highest to the lowest, July , April, March, January, May, December, November and September show higher average returns compared with the rest of the month; that is, 1.158%, 1.135%, 0.750%, 0.619%, 0.429%, 0.396%, 0.309% and 0.249% against -0.081%, 0.091%, 0.163%, 0.176%, -0.744%, -0.146%, 0.182% and 0.193%, respectively. After applying the t test on the sample for 2006, the result shows 0.349; this indicates that at 5% level of significance which is 95% confidence level, the difference between the turn-of-the month average returns and the rest-of-the-month average returns is not statistically significant.

In 2007, the results, however, show that on average, that the average returns of the turn of the month are lower than the rest of the month for seven months. Sorting the average returns of the turn of the month, from the highest to the lowest, only December , July and February show higher average returns compared with the rest of the month; that is, 0.971%, 0.348% and 0.193% against 0.161%, 0.130% and -0.480%, respectively. After applying the t test on the 2007 sample, the result shows 0.288; this result indicates that the difference between the turn-of-the month average returns and the rest-of-the-month average returns is statistically insignificant.

In 2008, the results show negative average returns, but on average, negative average returns of the turn of the month are lower than those the rest of the month. Arranging the average returns of the turn of the month, from the highest to the lowest, August, November, December, January, September, February and May show higher average returns compared with the rest of the month; that is, 1.255%, 1.244%, 0.821%, 0.520%, 0.232%, 0.131% and 0.149% against -0.366%, -0.718%, 0.175%, -1.014%, -0.587%, -0.068% and -0.309%, respectively. After applying the t test on the 2008 sample, the result shows 0.522 which indicates the difference between the turn-of-the month average returns and the rest-of-the-month average returns is not statistically significant.

In 2009, the results show, on average, the average returns of the turn of the month is slightly lower than the average returns of the rest of the month. Sorting the average returns of the turn of the month, from the highest to the lowest, only the months of April, June, January, December and August show higher average returns compared with the rest of the month; that is, 1.211%, 1.118%, 1.053%, 0.341% and 0.264% against 0.339%, -0.275%, -0.631%, 0.097% and 0.201%, respectively. On the other hand, the average returns of the rest of the month for March and May show high average returns of 1.341% and 1.065% against -1.160% and 0.997%, respectively. After applying the t test on the 2009 sample, the result shows 0.887; this also indicates that the difference between the turn-of-the month average returns and the rest-of-the-month average returns is not statistically significant.

In 2010, the results show, on average, that the average returns of the turn of the month are higher than the rest of the month for eight months. Classifying the average returns of the turn of the month, from the highest to the lowest, March, November, December, June, October, January, April and August show higher average returns compared with the rest of the month; that is, 0.771%, 0.730%, 0.682%, 0.435%, 0.428%, 0.240%, 0.224% and 0.152% against 0.275%, -0.587%, 0.004%, 0.236%, -0.190%, -0.035%, -0.215% and -0.044%, respectively. After applying the t test on the sample for 2010, the result shows 0.210 which indicates that the difference between the turn-of-the month average returns and the rest-of-the-month average returns is not statistically significant.

In 2011, the results also show, on average, that the average returns of the turn of the month are higher than the rest of the month for six months. Sorting the average returns of the turn of the

month, from the highest to the lowest, April, September, December, November, June and May show higher average returns compared with the rest of the month; that is, 1.695%, 1.273%, 0.711%, 0.262%, 0.239% and 0.169% against 0.009%, -0.237%, -0.487%, -0.611%, -0.094%, -0.035% and 0.015%, respectively. The average returns of the turn of the month window as well as the rest of the month average returns are not calculated due to missing data after downloading the sampling data; all of Bloomberg, Thomson Reuters and Yahoo Finance do not include the full data for March 11. Thus March data is excluded from the analysis. After applying the t test on the sample for 2010, the result shows 0.194. This indicates that at 5% significance level the difference between the turn-of-the month average returns and the rest-of-the-month average returns is not statistically significant.

Moving to analyzing the results post examination of the anomaly in RTS Russia index, most of the results show a bias towards the presence of the turn-of-the-month anomaly in this emerging market. Starting in 2005, it is found, on average, that the average returns of the turn of the month are higher than the rest of the month for seven months. Having ordered the average returns of the turn of the month, from the highest to the lowest, November, February, July, April, December, January and March show higher average returns compared with the rest of the month; that is, 1.318%, 1.116%, 0.957%, 0.816%, 0.514%, 0.428% and 0.394% against 0.419%, 0.378%, 0.268%, -0.320%, 0.313%, -0.020% and -0.275%, respectively. After applying the t test on the 2005 sample, the result shows 0.110. This indicates that at 5% significance level, the difference between the turn-of-the month average returns and the rest-of-the-month average returns is not statistically significant. A summary of turn-of-the-month anomaly for RTS Russia index from 2005 to 2011 is provided in Appendix (2).

In 2006, it is found, on average, that the average returns of the turn of the month are higher than the rest of the month for seven months. Having ordered the average returns of the turn of the month, from the highest to the lowest, July, April, December, August, May, October and November show higher average returns compared with the rest of the month; that is, 1.378%, 1.185%, 1.009%, 0.722%, 0.689%, 0.507% and 0.482% against 0.105%, 0.793%, 0.060%, 0.053%, -0.903%, 0.240% and 0.212%, respectively. After applying the t test on the 2006 sample, the result shows 0.337, which indicates that the difference between the turn-of-the month average returns and the rest-of-the-month average returns is not statistically significant

In 2007, it is found, on average, that the average returns of the turn of the month are higher than the rest of the month for six months. Having ordered the average returns of the turn of the month, from the highest to the lowest, July, June, February, December, November and April show higher average returns compared with the rest of the month; that is, 0.848%, 0.806%, 0.767%, 0.685%, 0.406% and 0.147% against -0.019%, 0.215%, 0.188%, 0.075%, -0.338% and 0.060%, respectively. After applying the t test on the 2007 sample, the result shows 0.856; this indicates that the difference between the turn-of-the month average returns and the rest-of-the-month average returns is not statistically significant.

In 2008, it is found, on average, that the average returns of the turn of the month are both negative during the turn of the month and the rest of the month; the rest of the month average returns are slightly less negative than the turn-of-the-month average returns. Having arranged the average returns of the turn of the month, from the highest to the lowest, only November and January show higher average returns compared with the rest of the month; that is, 3.875% and 0.348% against -1.750% and -1.382%, respectively. The turn-of-the-month average returns for October show the biggest drop of -6.57%. After applying the t test on the 2008 sample, the result shows 0.952. This indicates that the difference between the turn-of-the month average returns and the rest-of-the-month average returns is not statistically significant.

In 2009, it is found, on average, that the average returns of the turn of the month are higher than the rest of the month for six months. Having ordered the average returns of the turn of the month, from the highest to the lowest, May, August, June, December and April show higher average returns compared with the rest of the month; that is, 2.246%, 1.784%, 1.215%, 0.719% and 0.623% against 0.962%, -0.082%, -0.930%, 0.106% and 0.289%, respectively. After applying the t test on the 2009 sample, the result shows 0.654. This indicates that the difference between the turn-of-the month average returns and the rest-of-the-month average returns is not statistically significant.

In 2010, it is also found, on average, that the average returns of the turn of the month are higher than the rest of the month for nine months. Having ordered the average returns of the turn of the month, from the highest to the lowest, January, December, October, April, March, September, August, November and February show higher average returns compared with the rest of the month; that is, 1.295%, 1.096%, 1.031%, 0.856%, 0.800%, 0.557%, 0.478%, 0.317% and

0.191% against -0.854%, 0.208%, 0.020%, -0.275%, 0.316%, 0.059%, -0.410%, -0.046%, and -0.307%, respectively. After applying the t test on the 2010 sample, the result shows 0.227. This indicates that the difference between the turn-of-the month average returns and the rest-of-the-month average returns is not statistically significant.

In 2011, it is also found, on average, that the average returns of the turn of the month are higher than the rest of the month for five months. Having ordered the average returns of the turn of the month, from the highest to the lowest, March, January, April, July and December show higher average returns compared with the rest of the month; that is, 0.950%, 0.937%, 0.744%, 0.565% and 0.117% against 0.020%, 0.243%, -0.301%, 0.127% and -0.451%, respectively. After applying the t test on the 2009 sample, the result shows 0.751. This indicates that at 5% significance level the difference between the turn-of-the month average returns and the rest-of-the-month average returns is not statistically significant.

The results of analysing SSE China index are a mixture of positive and negative average returns. In 2005, it is found, on average, that the average returns of the turn of the month and the rest of the month are negative though the rest of the month average returns are less negative. Having ordered the average returns of the turn of the month, from the highest to the lowest for 2005, February, October, April, September and May show higher average returns compared with the rest of the month; that is, 0.576%, 0.347%, 0.275%, 0.271% and 0.150% against 0.227%, -0.342%, -0.373, -0.225% and -0.607%, respectively. After applying the t test on the 2005 sample, the result shows 0.586. This indicates that at 5% significance level the difference between the turn-of-the month average returns and the rest-of-the-month average returns is not statistically significant. A summary of turn-of-the-month anomaly for SSE China index from 2005 to 2011 is provided in Appendix (3).

In 2006, it is found, on average, that the average returns of the turn of the month are higher than the rest of the month for eight months. Having ordered the average returns of the turn of the month, from the highest to the lowest, July, November, January, April, February, June, October and September show higher average returns compared with the rest of the month; that is, 1.008%, 0.741%, 0.570%, 0.431%, 0.387%, 0.306%, 0.262% and 0.212% against -0.259%, 0.486%, 0.309%, 0.403%, 0.051%, -0.150%, 0.192% and 0.208%, respectively. After applying the t test on the 2006 sample, the result shows 0.824. This indicates that the difference between

the turn-of-the month average returns and the rest-of-the-month average returns is not statistically significant.

In 2007, it is found, on average, that the average returns of the turn of the month and the rest of the month are negative though the turn-of-the-month average returns are less negative. Having ordered the average returns of the turn of the month, from the highest to the lowest, January, August, September, December and October show higher average returns compared with the rest of the month; that is, 1.139%, 1.051%, 0.902%, 0.785%, and 0.654% against 0.477%, 0.582%, -0.073%, 0.276% and 0.204%, respectively. After applying the t test on the 2007 sample, the result shows 0.138. This means that the difference between the turn-of-the month average returns and the rest-of-the-month average returns is not statistically significant.

In 2008, it is also found, on average, that the average returns of the turn of the month and the rest of the month are negative though the turn-of-the-month average returns are less negative. Having ordered the average returns of the turn of the month, from the highest to the lowest, December, May, February, April, January and March show higher average returns compared with the rest of the month; that is, 0.886%, 0.851%, 0.522%, 0.169%, 0.165% and 0.103% against -0.487%, -0.397%, -0.397%, 0.051%, -1.086% and -1.637%, respectively. After applying the t test on the 2008 sample, the result shows 0.185 which indicates that the difference between the turn-of-the month average returns and the rest-of-the-month average returns is not statistically significant.

In 2009, it is also found, on average, that the average returns of the turn of the month are higher than the rest of the month for nine months. Having ordered the average returns of the turn of the month, from the highest to the lowest, May, October, July, June, February, December, November, August and April show higher average returns compared with the rest of the month; that is, 1.308%, 1.204%, 1.082%, 0.975%, 0.923%, 0.751%, 0.667%, 0.453% and 0.448% against 0.040%, 0.203%, 0.261%, 0.353%, 0.360%, -0.263%, 0.034%, -0.868%, and -0.104%, respectively. After applying the t test on the 2009 sample, the result shows 0.006. This indicates that the difference between the turn-of-the month average returns and the rest-of-the-month average returns is statistically significant.

In 2010, it is found, on average, that the average returns of the turn of the month and the rest of the month are both negative though the turn-of-the-month average returns are less negative.

Having ordered the average returns of the turn of the month, from the highest to the lowest, only October, September, November and April show higher average returns compared with the rest of the month; that is, 1.524%, 0.537%, 0.493% and 0.130% against 0.463%, -0.246%, -0.452% and -0.547%, respectively. After applying the t test on the 2010 sample, the result shows 0.842. This indicates that the difference between the turn-of-the month average returns and the rest-of-the-month average returns is not statistically significant.

Finally in 2011, it is found, on average, that the average returns of the turn of the month are higher than the rest of the month for eight months. Having ordered the average returns of the turn of the month, from the highest to the lowest, April, November, January, February, March, July, October and June show higher average returns compared with the rest of the month; that is, 0.652%, 0.622%, 0.520%, 0.467%, 0.365%, 0.307%, 0.323% and 0.210% against -0.270%, -0.370%, -0.229%, 0.232%, -0.270%, -0.210%, -0.013% and 0.063%, respectively. After applying the t test on the 2011 sample, the result shows 0.028. This means the difference between the turn-of-the month average returns and the rest-of-the-month average returns is statistically significant.

The analysis of Bovespa index shows both positive and negative average returns; however, the results are of poor statistical significance. In 2005, it is found, on average, that the average returns of the turn of the month are higher than the average returns of the rest of the month. Having classified the average returns of the turn of the month, from the highest to the lowest for 2005, February, November, December, September, August, March, January, June and May show higher average returns compared with the rest of the month; that is, 1.141%, 1.009%, 0.963%, 0.871%, 0.728%, 0.440%, 0.380%, 0.197% and 0.128% against 0.833%, 0.093%, 0.016%, 0.546%, 0.200%, -0.763%, -0.099%, -0.073% and -0.048%, respectively. After applying the t test on the 2005 sample, the result shows 0.235. This shows that at 5% significance level, the difference between the turn-of-the month average returns and the rest-of-the-month average returns is not statistically significant. A summary of turn-of-the-month anomaly for Bovespa index from 2005 to 2011 is provided in Appendix (4).

Year 2006 shows the best average returns in terms of statistical significance results. It is found, on average, that the average returns of the turn of the month are higher than the average returns of the rest of the month. Having sorted the average returns of the turn of the month, from the

highest to the lowest for 2006, October, December, July, April, January, November, August, May and September show higher average returns compared with the rest of the month; that is, 0.8420%, 0.813%, 0.793%, 0.779%, 0.764%, 0.713%, 0.428%, 0.410% and 0.185% against 0.233%, 0.050%, 0.064%, 0.235%, 0.529%, -0.001%, -0.245%, -0.514% and -0.119%, respectively. After applying the t test on the 2006 sample, the result shows 0.024. This indicates that the difference between the turn-of-the month average returns and the rest-of-the-month average returns is statistically significant.

In 2007, Bovespa index shows average returns over the turn of the months slightly are better than the average returns of the rest of the months, but with poor statistical significance. The average returns of the turn of the month, from the highest to the lowest for 2007, for December, April, February, July, May and August are higher than the average returns of rest of the month; that is, 1.066%, 0.791%, 0.667%, 0.542%, 0.407% and 0.053% against -0.380%, 0.361%, 0.156%, -0.369%, 0.175% and -0.040%, respectively. After applying the t test on the 2007 sample, the result shows 0.737. This indicates that the difference between the turn-of-the month average returns and the rest-of-the-month average returns is not statistically significant.

In 2008, the overall performance of Bovespa index is very poor. Both turn-of-the month average returns and the rest-of-the-month average returns are negative. The average returns of the turn of the month are higher than the rest of the month only for three months. Having ordered the average returns of the turn of the month, from the highest to the lowest, only April, May and November show higher average returns compared with the rest of the month; that is, 0.981%, 0.827% and 0.710% against 0.118%, 0.416% and 0.023%, respectively. After applying the t test on the 2008 sample, the result shows 0.253 which means that the difference between the turn-of-the month average returns and the rest-of-the-month average returns is statistically insignificant.

The performance of year 2009 is the second best year after 2006. The average returns of the turn of the month are higher than the average returns of the rest of the month. Having arranged the average returns of the turn of the month, from the highest to the lowest, January, May, November, April, August, June February, October and December show higher average returns compared with the rest of the month; that is, 1.699%, 1.474%, 1.152%, 0.875%, 0.615%, 0.530%, 0.361%, 0.3640%, and 0.302% against -0.098%, 0.243%, 0.226%, 0.263%, 0.229%, -0.251%, -0.605%, -0.272% and -0.002%, respectively. After applying the t test on the 2009

sample, the result shows 0.074. This indicates that at 5% significance, the difference between the turn-of-the month average returns and the rest-of-the-month average returns is not statistically significant.

In 2010, the average returns of the turn of the month are higher the average returns of the rest of the month. Having ordered the average returns of the turn of the month, from the highest to the lowest, January, March, November, August, December, October, September and April show higher average returns compared with the rest of the month; that is, 0.614%, 0.504%, 0.475%, 0.395%, 0.321%, 0.313%, 0.293% and 0.202% against -0.611%, 0.181%, -0.445%, -0.264%, -0.182%, 0.003%, 0.243% and -0.430%, respectively. After applying the t test on the 2010 sample, the result shows 0.391. This indicates that the difference between the turn-of-the month average returns and the rest-of-the-month average returns is not statistically significant.

The last year of 2011 in the analysis shows again negative average returns for both the turn of the month and the rest of the month. Having arranged the average returns of the turn of the month, from the highest to the lowest, December, January, September, April, March and July show higher average returns compared with the rest of the month; that is, 1.015%, 0.610%, 0.522%, 0.395%, 0.263% and 0.070% against -0.174%, -0.261%, -0.405%, -0.315%, -0.058% and -0.427%, respectively. After applying the t test on the 2011 sample, the result shows 0.898. This indicates that the difference between the turn-of-the month average returns and the rest-of-the-month average returns is not statistically significant.

The final analysis is for the South African FTSE-JSE index. Among the seven years, only 2005 shows higher average returns of the turn of the month compared with the average returns of the rest of the month, and at a high significance level. In 2005, ten months out of twelve show higher average returns over the turn of the month compared with the rest of the month. The first five months that have the highest average returns are November, July, September, May and February. Their average returns are 0.766%, 0.438%, 0.379%, 0.345% and 0.322%, respectively, opposed by their turn of the month peers that show 0.096%, 0.046%, 0.147%, 0.135% and 0.021%, respectively. After applying the t test on the 2005 sample, the result shows 0.0196. This indicates that the difference between the turn-of-the month average returns and the rest-of-the-month average returns is statistically significant. A summary of the turn-of-the-month anomaly for FTSE-JSE index from 2005 to 2011 is provided in Appendix (5).

In 2006, the average returns of the turn of the month are higher than the average returns of the rest of the month for eight months. Having ordered the average returns of the turn of the month, from the highest to the lowest, July, January, December, April, October, November and September show higher average returns compared with the rest of the month; that is, 0.584%, 0.323%, 0.244%, 0.238%, 0.234%, 0.179% and 0.147% against 0.026%, 0.089%, 0.144%, 0.072%, 0.155%, -0.168%, 0.022% and -0.868% and 0.073 %, respectively. After applying the t test on the 2006 sample, the result shows 0.006 which means that the difference between the turn-of-the month average returns and the rest-of-the-month average returns is statistically significant.

In 2007, the average returns of the turn of the month are higher than the average returns of the rest of the month for seven months. Having ordered the average returns of the turn of the month, from the highest to the lowest, September, December, April, October, May, February and July show higher average returns compared with the rest of the month; that is, 0.505%, 0.369%, 0.359%, 0.345%, 0.340%, 0.321% and 0.416% against 0.068%, 0.001%, 0.075%, 0.133%, -0.005%, -0.098% and -0.409%, respectively. After applying the t test on the 2007 sample, the result shows 0.500. This indicates the difference between the turn-of-the month average returns and the rest-of-the-month average returns is not statistically significant.

In 2008, the average returns are negative for both the turn of the month and the rest of the month. Examining the monthly average returns, the turn of the month average returns are found higher than the average returns of the rest of the month for four months. Having ordered the average returns of the turn of the month, from the highest to the lowest, only April, August, January, May and November show higher average returns compared with the rest of the month; that is, 0.602%, 0.545%, 0.467% and 0.272% against 0.125%, 0.047%, -0.226% and -0.280%, respectively. After applying the t test on the 2008 sample, the result shows 0.950 which indicates that the difference between the turn-of-the month returns and the rest-of-the-month returns is not statistically significant

2009 average returns of the turn of the month are higher than the average returns of the rest of the month for six months. Having ordered the returns of the turn of the month, from the highest to the lowest, May, January, August, April, December and November show higher returns compared with the rest of the month; that is, 1.235%, 0.752%, 0.619%, 0.424% and 0.161%

against -0.007%, -0.326%, 0.252%, 0.178%, 0.093% and -0.060%, respectively. After applying the t test on the 2009 sample, the result shows 0.673. This indicates that the difference between the turn-of-the month returns and the rest-of-the-month returns is statistically insignificant.

The last year of 2011 in the analysis shows that the average returns of the turn of the month are also slightly better than the average returns of the rest of the month for seven months. Having ordered the returns of the turn of the month, from the highest to the lowest, December, July, April, March, October, September and February show higher returns compared with the rest of the month; that is, 0.761%, 0.674%, 0.287%, 0.232%, 0.158% , 0.092% and 0.084% against -0.096%, -0.177%, 0.039%, -0.055%, 0.511% , 0.054% and -0.102%, respectively. After applying the t test on the 2011 sample, the result shows 0.727 which means that the difference between the turn-of-the month average returns and the rest-of-the-month average returns is statistically insignificant at 5% level.

In addition to the above detailed analysis of each index for seven years, a yearly analysis is made for each index for seven years along with the statistical t test. CNX Nifty index has a higher average return for the turn of the month compared with the average return of the rest of the month. 2005 represents the highest average returns of 0.309% over the turn of the month, whereas 2008 represents the lowest average returns of -0.137% for the same window. The result of the t test applied for the yearly turn-of-the-month and the rest-of-the-month returns is 0.185. This indicates that at 5% significance level, the difference between the turn-of-the month returns and the rest-of-the-month returns is not statistically significant.

RTS Russia index has also a higher average return for the turn of the month compared with the average return of the rest of the month. 2005 represents the highest average returns of 0.467% over the turn of the month, whereas 2008 shows the lowest average returns of -0.566% for the same window. The t test applied on the yearly turn-of-the-month and the rest-of-the-month average returns is 0.529. This indicates that at 5% significance level which is 95% confidence level, the difference between the turn-of-the month average returns and the rest-of-the-month returns is not statistically significant.

Similar to the two indices above, SSE China index has also a higher average return of the turn of the month compared with the average return of the rest of the month. 2009 represents the highest

average returns of 0.640% over the turn of the month, whereas 2007 shows the lowest average returns of -0.178% for the same window. The t test applied for the yearly turn-of-the-month and the rest-of-the-month average returns is 0.529. This indicates that the difference between the turn-of-the month returns and the rest-of-the-month returns is not statistically significant.

Bovespa index has also a higher average return over the turn of the month compared with the average return of the rest of the month. 2009 represents the highest average returns of 0.534% over the turn of the month, whereas 2011 represents the lowest average returns of -0.071% for the same window. The t test applied for the yearly turn-of-the-month and the rest-of-the-month average returns is 0.379. This indicates that at 5% significance level the difference between the turn-of-the month average returns and the rest-of-the-month average returns is statistically insignificant.

Finally, FTSE-JSE index has a higher average return over the turn of the month compared with the average return of the rest of the month. 2005 represents the highest average returns of 0.228% over the turn of the month, whereas 2008 represents the lowest average returns of -0.181% for the same window. The t test applied for the yearly turn of the month and the rest of the month returns is 0.149. This indicates that the difference between the turn-of-the month average returns and the rest-of-the-month average returns is not statistically significant.

Appendix (6) provides the average annual returns of the turn of the month and the rest of the month of the five indices.

The January effect is also examined in the five indices to test the second null hypothesis of equal average returns at 5% level of significance. After examining the January anomaly in CNX Nifty index, it is found that only the January average returns are higher than the other 11 months only in 2006, with t test equal to 0.200. This indicates that at 5% significance level which is 95% confidence level, the difference between the turn-of-the month returns and the rest-of-the-month returns is not statistically significant. Therefore, the January effect does not exist in CNX Nifty index. For the rest of the four indices, the January average returns are found only in one to three years maximum out of the seven years. In RTS Russia index, the January average returns are higher than the other remaining months only in 2006, 2010 and 2011. In SSE China index, the January average returns are higher than the other remaining months only in 2006, 2009 and 2011. In Bovespa index, the January average returns are higher than the other remaining months

only in 2006. Finally, in FTSE-JSE index, the January average returns are higher only in 2006 and 2011. Furthermore, the t test results against the January average returns and the other eleven months for RTS Russia, SSE China, Bovespa and FTSE-JSE indices are 0.526, 0.638, 0.566 and 0.164, respectively. This indicates that at 5% significance level, the difference between the turn-of-the-month average returns and the rest-of-the-month average returns is not statistically significant for the other four indices.

Thus, the results show no evidence of the January effect in the five emerging stock market indices. Appendix (7) provides a summary of the January effect of each of the five indices.

## **CHAPTER 7**

# FINDINGS AND RECOMMENDATIONS

## **Chapter 7: Findings and Recommendations**

Having examined the turn-of-the month anomaly in the five emerging stock market indices from 2005 to 2011 for each month of the seven years and for the annual average returns, this research finds poor evidence of the turn-of-the-month anomaly in these markets. On the annual average basis, the results show no evidence of the turn-of-the-month anomaly in the five indices. This is supported by the statistical t test results at 5% level of significance. The t test for CNX Nifty, RTS Russia, SSE China, Bovespa and FTSE-JSE indices are 0.185, 0.333, 0.529, 0.379 and 0.149, respectively.

Moving to the micro level of the turn-of-the-month analysis of the individual months for seven years, the research finds that there is no existence of the anomaly in CNX Nifty and RTS Russia indices. None of the statistical t test results are significant at 5% level. Appendices (1) and (2) summarize the average returns of the turn of the month and rest of the month for the period from 2005 to 2011, and the accumulative average returns and t test results. SSE China index shows the average returns of the turn of the month for 2009 and 2011 are statistically high at 5% significance level; 0.028 and 0.006, respectively. The rest of the months show no evidence of any similar anomaly. This supported by the statistical t test results; Appendix (3) summarises the results of the data analysis of the SSE China index for the period from 2005 to 2011.

Bovespa and FTSE-JSE indices also show poor evidence of the turn-of-the-month anomaly. Bovespa and FTSE-JSE show high average returns over the turn of the month only for 2006 and 2005 at 5% significance level, 0.024 and 0.019, respectively. Appendices (4) and (5) show the results of the turn-of-the-month analysis for both indices. Although the SSE China Bovespa and FTSE-JSE show high average returns over the turn of the month for one year or two, the lack of a regular pattern of the anomaly confirms the previous results found in Nifty CNX and RTS Russia indices.

The final findings that result from the examination of the turn-of-the-month anomaly in the five emerging stock market indices reveal no evidence of the anomaly, even though the analysis period includes both bullish and bearish trends. This is supported by the statistical t test at 5% level of significance. These results accept the first null hypothesis that states the average returns over the turn of the month are equal to the average returns of the rest of the month. Thus, these findings support the EMH as well as the results found in the reviews explored in the literature review chapter.

After examining the January effect in the five emerging stock market indices from 2005 to 2011 as the second objective of the research, it is found that there is no evidence of the anomaly in these emerging markets either. This is not only supported by the overall returns of the month of January and the other eleven months for seven years, but also by the statistical t test at 5% level of significance; the t test for CNX Nifty, RTS Russia, SSE China, Bovespa and FTSE-JSE indices are 0.200, 0.526, 0.638, 0.566 and 0.146, respectively. Also, it is found that the highest returns are made in 2006, whereas the lowest returns are made in 2008 for all the five indices.

This is mainly due to the bullish and bearish cycles that took place in 2006 and 2008, respectively. The 2008 steep drop reflects the impact of the latest financial crisis that started at the end of 2007. This finding accepts the second null hypothesis that states there is no difference between the average returns of the January month and the average returns of the other eleven months. Therefore, this finding supports the efficient market hypothesis. Appendix (7) summarises the annual average returns of the January effect analysis of the five indices for the selected period.

After finding no evidence of the turn-of-the-month anomaly and the January effect in the five emerging market indices, it is recommended that investors and other market participants should not trade these anomalies in these markets. There is no regular patterns found that would allow traders to make profits from these anomalies. Academicians are encouraged to retest the sample and the results in this research, and explore other financial market anomalies in these emerging markets. This is because these emerging markets are still considered tempting especially after the debt crisis in the Euro Zone that affected the investors' confidence, and the slow economic growth in the US and other parts of the world. Researchers are also encouraged to test the same anomalies using other data samples and different statistical tests at various significant levels. The more empirical studies are conducted in the same markets, the more agreement on the findings, the stronger the evidence will exist to enable market participants make the maximum use of these financial anomalies.

# CHAPTER 8

# CONCLUSION

## **Chapter 8: Conclusion**

The existing literature includes various studies that investigate evidence of financial anomalies in various financial markets. The primary objectives of this research are to extend the research through examining the presence of the turn-of-the-month anomaly and the January effect in five famous emerging market indices. These indices include S&P CNX Nifty Index, RTS Russia Index, SSE Index, Bovespa Index and FTSE-JSE Index. They are major stock indices in India, Russia, China, Brazil and South Africa, respectively. The data covers a seven-year period, from

2005 to 2011. The objectives test two null hypotheses: the first one assumes that the average returns over the turn of the month are equal to the average returns of the rest of the month. The second one assumes that the average returns of the month of January are higher than the average returns of the other remaining months. To examine the turn-of-the-month anomaly, each index returns are calculated separately from the rest of the month using a six-day event window. For the January effect, the average returns of the month of January and the average returns of the other remaining months are computed. The results of both anomalies are tested statistically using the student t test to examine the statistical difference between the turn-of-the-month average returns and the rest-of-the-month average returns at 5% level of significance. It is also used to test the statistical difference of January average returns and the rest of the months' average returns. The research finds no evidence of the turn-of-the-month anomaly and the January effect in the five emerging market indices. This is supported by the statistical t test at 5% significance level, which is 95% confidence level. Therefore, the findings accept the two null hypotheses, supporting the EMH.

Since there is no evidence of the two anomalies in these emerging markets, market participants should not trade these anomalies as it may lead to unwanted losses. No regular patterns are found in these markets that would allow traders to make profits from these anomalies. Academicians are encouraged to re-examine the results of this research, and explore other financial market anomalies in these emerging markets. These markets are still considered promising especially after the debt crisis in the Euro Zone that affected the investors' confidence, and the slow economic growth in the US and other parts of the world. Moreover, future research should be encouraged to investigate the same anomalies using other data samples and other statistical tests at different significant levels. Future research might find it also interesting to examine financial anomalies at the sector levels.



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## Appendix (1)

Detailed descriptive statistics are provided for 7 years, examining the turn-of-the-month (TOM) anomaly in CNX Nifty Index:

Table 1: A summary of descriptive statistics for examining the TOM anomaly for 2005:

2005		
Month	TOM	ROM
January	-0.584%	-0.146%
February	1.017%	-0.078%
March	0.736%	-0.468%
April	0.703%	-0.446%
May	0.239%	0.345%
June	0.145%	0.226%
July	0.442%	0.267%
August	0.346%	-0.075%
September	0.636%	0.421%
October	-0.122%	-0.612%
November	0.462%	0.714%
December	-0.308%	0.350%
<b>Average</b>	0.309%	0.041%
<b>T-Test</b>	<b>0.149</b>	

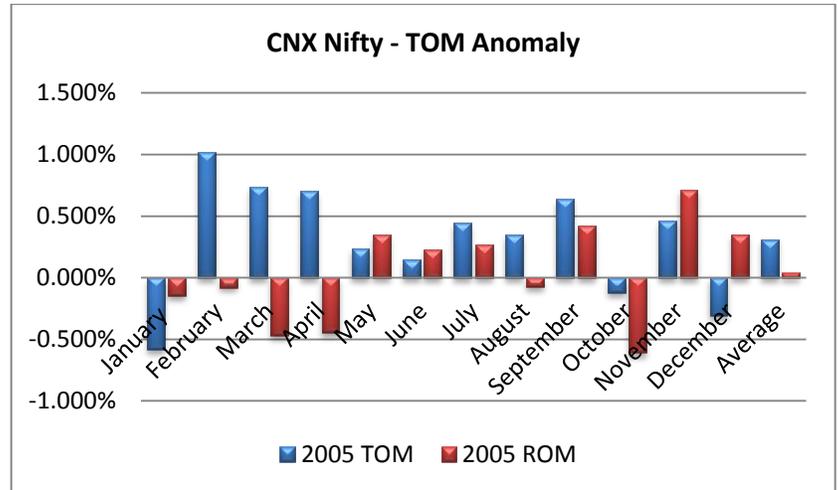


Table 2: A summary of descriptive statistics for examining the TOM anomaly for 2006:

2006		
Month	TOM	ROM
January	0.619%	0.176%
February	0.099%	0.117%
March	0.750%	0.163%
April	1.135%	0.091%
May	0.429%	-0.744%
June	-1.505%	0.117%
July	1.158%	-0.081%
August	-0.027%	0.557%
September	0.249%	0.193%
October	-0.045%	0.387%
November	0.309%	0.182%
December	0.396%	-0.146%
<b>Average</b>	0.297%	0.084%
<b>T-Test</b>	<b>0.349</b>	

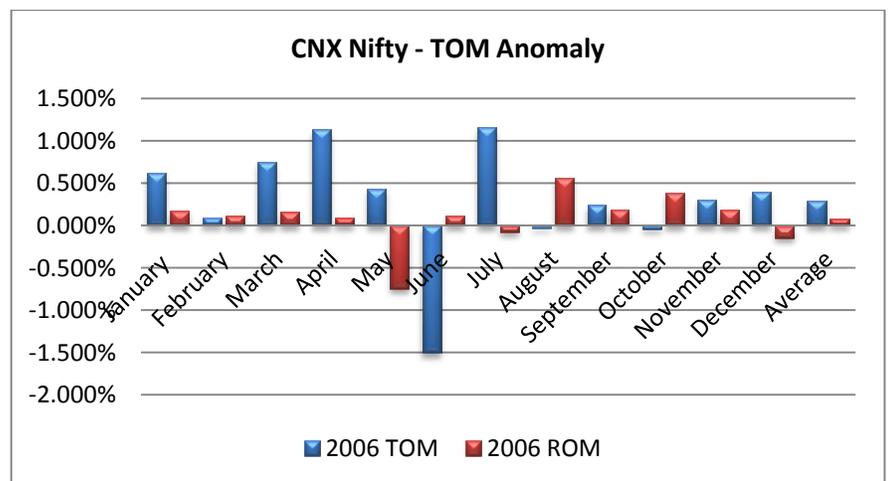


Table 3: A summary of descriptive statistics for examining the TOM anomaly for 2007:

2007		
Month	TOM	ROM
January	0.038%	0.289%
February	0.193%	-0.480%
March	-1.257%	0.190%
April	-0.040%	0.768%
May	-0.407%	0.345%
June	-0.448%	0.143%
July	0.348%	0.130%
August	-0.401%	0.028%
September	0.598%	0.638%
October	0.808%	0.813%
November	-0.340%	-0.185%
December	0.971%	0.161%
<b>Average</b>	0.005%	0.236%
<b>T-Test</b>	0.288	

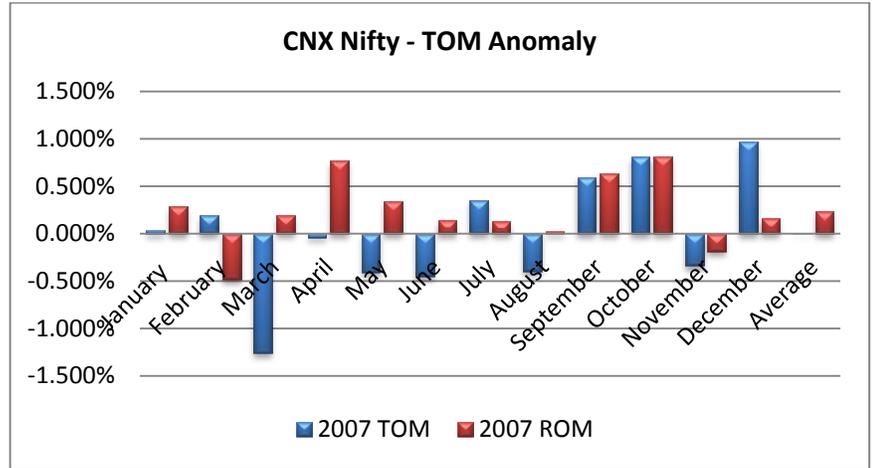


Table 4: A summary of descriptive statistics for examining the TOM anomaly for 2008:

2008		
Month	TOM	ROM
January	0.520%	-1.014%
February	0.131%	-0.068%
March	-1.651%	0.122%
April	-0.645%	0.650%
May	0.149%	-0.309%
June	-0.839%	-0.536%
July	-1.200%	0.249%
August	1.255%	-0.366%
September	0.232%	-0.587%
October	-1.664%	-2.109%
November	1.244%	-0.718%
December	0.821%	0.175%
<b>Average</b>	-0.137%	-0.376%
<b>T-Test</b>	0.522	

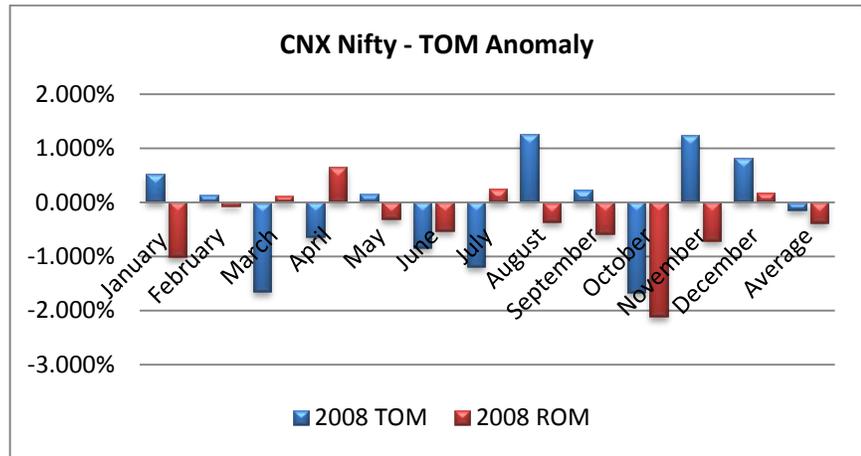


Table 5: A summary of descriptive statistics for examining the TOM anomaly for 2009:

2009		
Month	TOM	ROM
January	1.053%	-0.631%
February	-0.411%	-0.049%
March	-1.160%	1.341%
April	1.211%	0.339%
May	0.997%	1.065%
June	1.118%	-0.275%
July	-0.819%	0.472%
August	0.264%	0.201%
September	-0.028%	0.413%
October	0.0898%	-0.250%
November	-0.104%	0.305%
December	0.341%	0.097%
<b>Average</b>	0.213%	0.252%
<b>T-Test</b>	0.887	

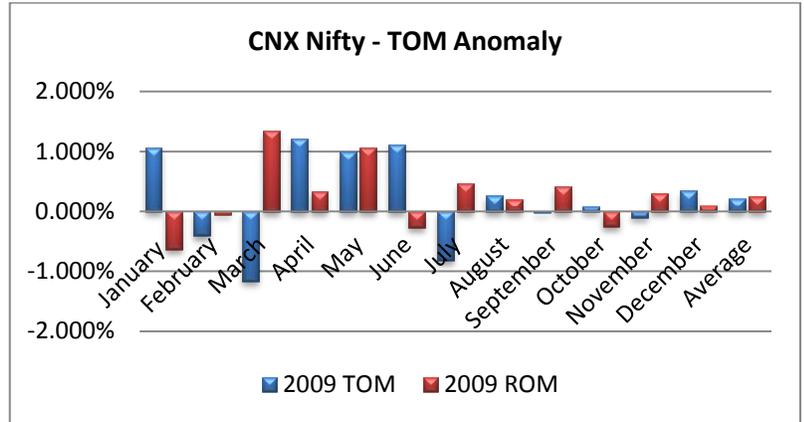


Table 6: A summary of descriptive statistics for examining the TOM anomaly for 2010:

2010		
Month	TOM	ROM
January	0.240%	-0.035%
February	-1.109%	-0.227%
March	0.771%	0.275%
April	0.224%	-0.215%
May	-0.403%	-0.116%
June	0.435%	0.236%
July	-0.139%	0.127%
August	0.152%	-0.044%
September	0.511%	0.520%
October	0.4283%	-0.190%
November	0.730%	-0.587%
December	0.682%	0.004%
<b>Average</b>	0.210%	-0.021%
<b>T-Test</b>	0.210	

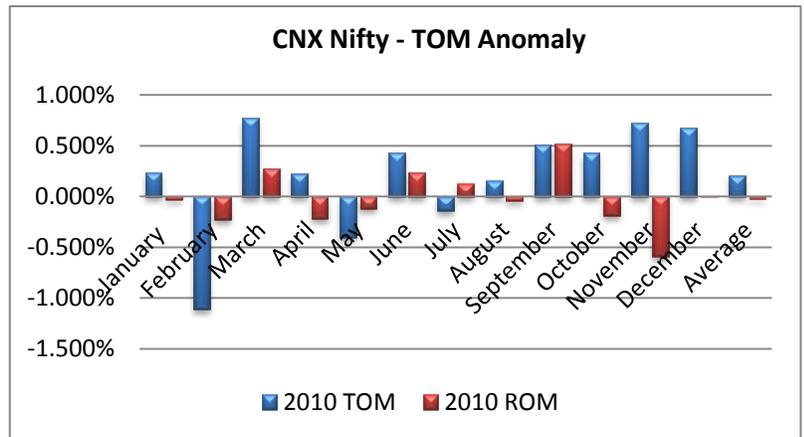
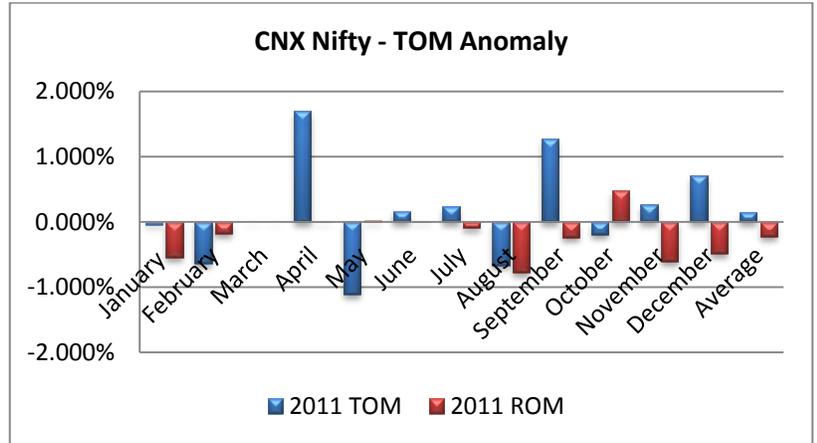


Table 7: A summary of descriptive statistics for examining the TOM anomaly for 2011:

2011		
Month	TOM	ROM
January	-0.033%	-0.545%
February	-0.632%	-0.178%
March*	-	-
April	1.695%	0.009%
May	-1.104%	0.019%
June	0.169%	0.015%
July	0.239%	-0.094%
August	-0.659%	-0.773%
September	1.273%	-0.237%
October	-0.1961%	0.479%
November	0.262%	-0.611%
December	0.711%	-0.487%
<b>Average</b>	0.157%	-0.219%
<b>T-Test</b>	0.194	

\*March 11 data is not available



## Appendix (2)

Detailed descriptive statistics are provided for 7 years, examining the turn-of-the-month (TOM) anomaly in RTS Russia Index:

Table 1: A summary of descriptive statistics for examining the TOM anomaly for 2005:

2005		
Month	TOM	ROM
January	0.43%	-0.02%
February	1.12%	0.38%
March	0.39%	-0.28%
April	0.82%	-0.32%
May	-0.10%	0.00%
June	0.12%	0.21%
July	0.96%	0.27%
August	0.50%	0.58%
September	0.12%	0.71%
October	-0.58%	-0.40%
November	1.32%	0.42%
December	0.51%	0.31%
<b>Average</b>	0.47%	0.15%
<b>T-Test</b>	0.110	

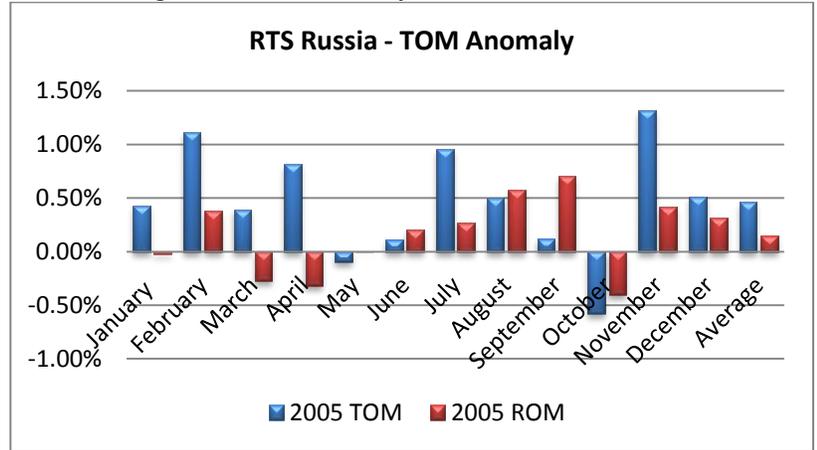


Table 2: A summary of descriptive statistics for examining the TOM anomaly for 2006:

2006		
Month	TOM	ROM
January	0.14%	1.24%
February	-0.59%	0.96%
March	-0.40%	-0.37%
April	1.19%	0.79%
May	0.69%	-0.90%
June	-0.25%	-0.24%
July	1.38%	0.11%
August	0.72%	0.05%
September	-0.14%	-0.47%
October	0.51%	0.24%
November	0.48%	0.21%
December	1.01%	0.06%
<b>Average</b>	0.40%	0.14%
<b>T-Test</b>	0.334	

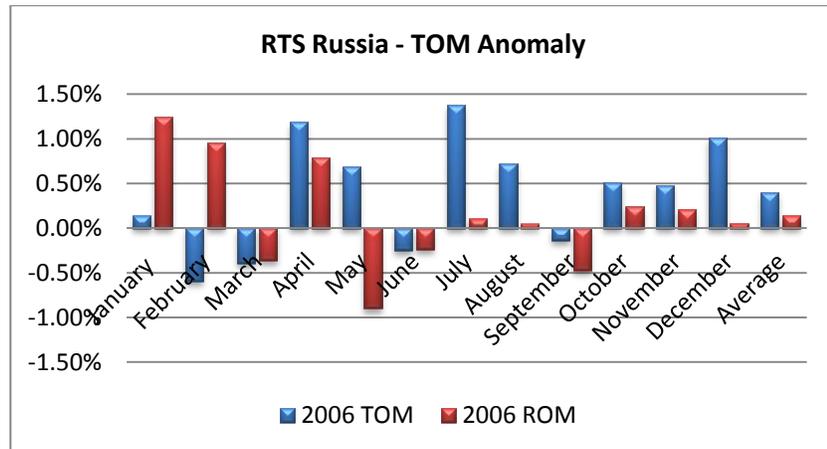


Table 3: A summary of descriptive statistics for examining the TOM anomaly for 2007:

2007		
Month	TOM	ROM
January	-0.67%	0.20%
February	0.77%	0.19%
March	-1.85%	0.59%
April	0.15%	0.06%
May	-0.28%	-0.69%
June	0.81%	0.22%
July	0.85%	-0.02%
August	-0.19%	-0.23%
September	0.43%	0.46%
October	0.33%	0.37%
November	0.41%	-0.34%
December	0.69%	0.08%
<b>Average</b>	0.12%	0.07%
<b>T-Test</b>	0.855	

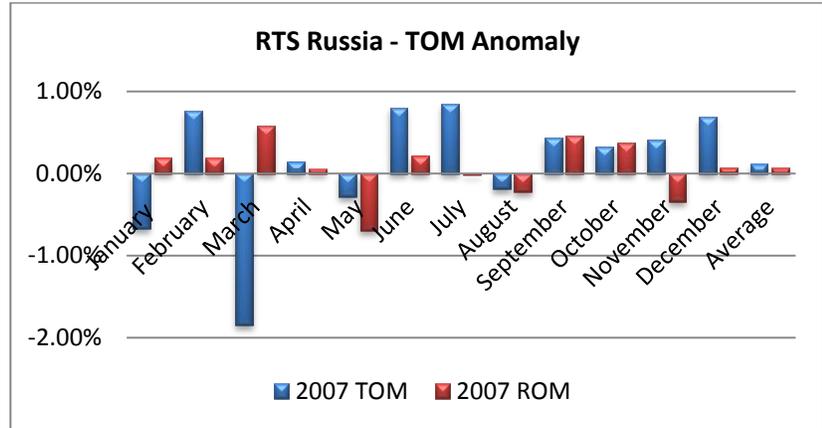


Table 4: A summary of descriptive statistics for examining the TOM anomaly for 2008:

2008		
Month	TOM	ROM
January	0.35%	-1.38%
February	-0.53%	0.53%
March	-0.37%	-0.07%
April	0.24%	0.27%
May	0.39%	0.61%
June	-0.32%	-0.14%
July	-0.90%	-0.84%
August	-0.73%	-0.89%
September	-0.67%	-1.07%
October	-6.58%	-1.98%
November	3.88%	-1.75%
December	-1.56%	0.45%
<b>Average</b>	-0.57%	-0.52%
<b>T-Test</b>	0.952	

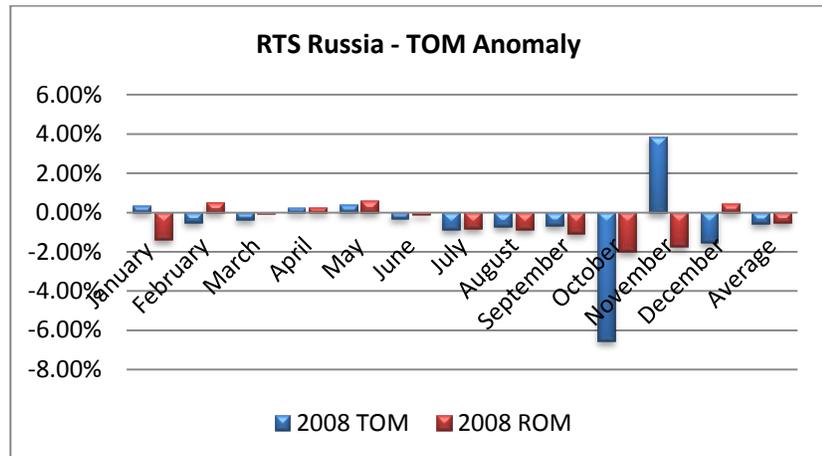


Table 5: A summary of descriptive statistics for examining the TOM anomaly for 2009:

2009		
Month	TOM	ROM
January	-0.58%	-1.16%
February	-1.05%	0.34%
March	0.64%	1.59%
April	0.62%	0.29%
May	2.25%	0.93%
June	1.22%	-0.93%
July	-0.60%	0.33%
August	1.78%	-0.08%
September	-0.11%	1.00%
October	0.29%	0.47%
November	-0.25%	0.09%
December	0.72%	0.11%
<b>Average</b>	0.41%	0.25%
<b>T-Test</b>	0.654	

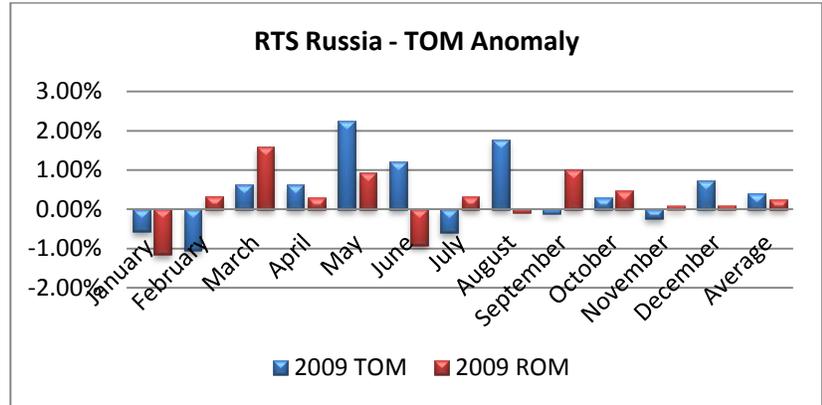


Table 6: A summary of descriptive statistics for examining the TOM anomaly for 2010:

2010		
Month	TOM	ROM
January	1.30%	-0.85%
February	0.19%	-0.31%
March	0.80%	0.32%
April	0.86%	-0.28%
May	-2.20%	-0.06%
June	0.03%	0.19%
July	-0.60%	0.54%
August	0.48%	-0.41%
September	0.56%	0.06%
October	1.03%	0.02%
November	0.32%	-0.05%
December	1.10%	0.21%
<b>Average</b>	0.32%	-0.05%
<b>T-Test</b>	0.227	

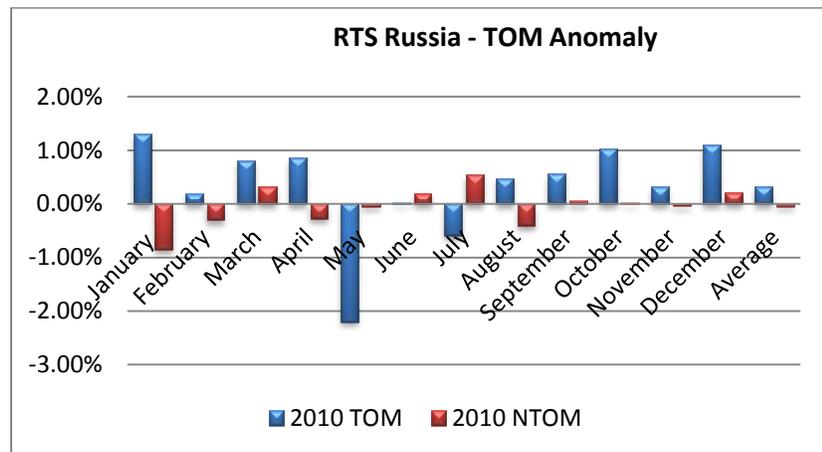
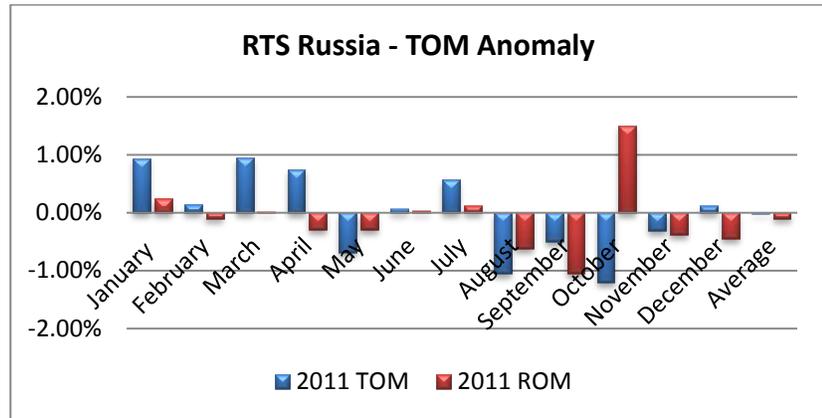


Table 7: A summary of descriptive statistics for examining the TOM anomaly for 2011:

2011		
Month	TOM	ROM
January	0.94%	0.24%
February	0.15%	-0.11%
March	0.95%	0.02%
April	0.74%	-0.30%
May	-0.69%	-0.29%
June	0.07%	0.03%
July	0.57%	0.13%
August	-1.05%	-0.63%
September	-0.50%	-1.05%
October	-1.21%	1.50%
November	-0.31%	-0.39%
December	0.12%	-0.45%
<b>Average</b>	-0.02%	-0.11%
<b>T-Test</b>	0.751	



### Appendix (3)

Detailed descriptive statistics are provided for 7 years, examining the turn-of-the-month (TOM) anomaly in SSE China Index:

Table 1: A summary of descriptive statistics for examining the TOM anomaly for 2005:

2005		
Month	TOM	ROM
January	-0.46%	-0.07%
February	0.58%	0.23%
March	-0.29%	-0.44%
April	0.28%	-0.37%
May	0.15%	-0.61%
June	-0.28%	0.43%
July	-1.17%	0.35%
August	0.19%	0.27%
September	0.27%	-0.23%
October	0.35%	-0.34%
November	0.03%	0.06%
December	-0.35%	0.40%
<b>Average</b>	-0.06%	-0.03%
<b>T-Test</b>	0.856	

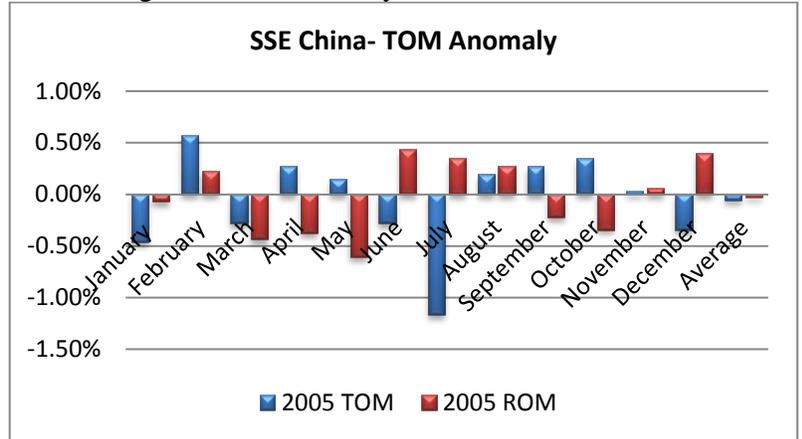


Table 2: A summary of descriptive statistics for examining the TOM anomaly for 2006:

2006		
Month	TOM	ROM
January	0.57%	0.31%
February	0.39%	0.05%
March	-0.10%	0.08%
April	0.43%	0.40%
May	0.27%	0.80%
June	0.31%	-0.15%
July	1.01%	-0.26%
August	-1.08%	0.30%
September	0.21%	0.21%
October	0.26%	0.19%
November	0.71%	0.49%
December	0.94%	1.00%
<b>Average</b>	0.33%	0.28%
<b>T-Test</b>	0.824	

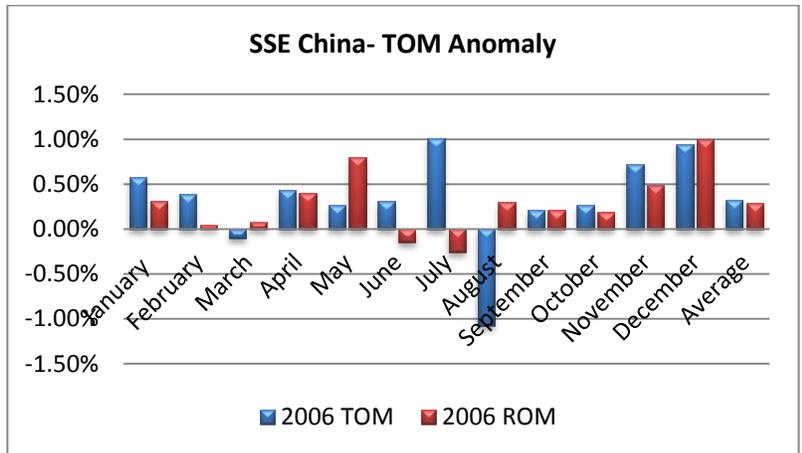


Table 3: A summary of descriptive statistics for examining the TOM anomaly for 2007:

2007		
Month	TOM	ROM
January	1.14%	0.48%
February	-1.60%	0.91%
March	-1.14%	0.69%
April	0.75%	0.87%
May	0.25%	0.71%
June	-2.30%	0.51%
July	-2.01%	1.15%
August	1.05%	0.58%
September	0.90%	-0.07%
October	0.65%	0.20%
November	-0.63%	-0.89%
December	0.79%	0.28%
<b>Average</b>	-0.18%	0.45%
<b>T-Test</b>	0.138	

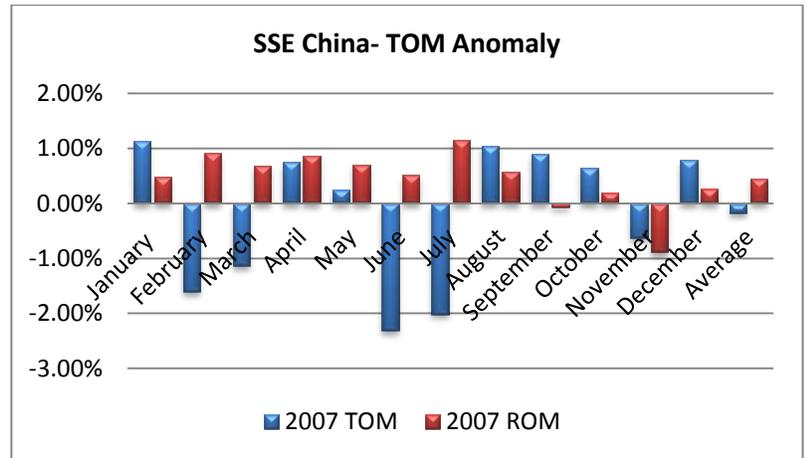


Table 4: A summary of descriptive statistics for examining the TOM anomaly for 2008

2008		
Month	TOM	ROM
January	0.17%	-1.09%
February	0.52%	-0.40%
March	0.10%	-1.64%
April	0.17%	0.05%
May	0.85%	-0.40%
June	-0.53%	-1.03%
July	-1.39%	0.39%
August	-0.78%	-1.00%
September	-0.47%	-0.21%
October	-1.11%	-1.34%
November	-0.02%	0.71%
December	0.89%	-0.49%
<b>Average</b>	-0.13%	-0.54%
<b>T-Test</b>	0.185	

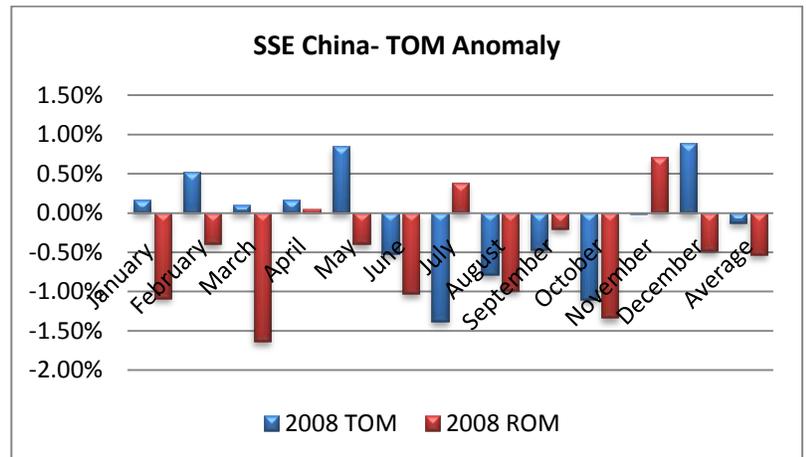


Table 5: A summary of descriptive statistics for examining the TOM anomaly for 2009:

2009		
Month	TOM	ROM
January	0.25%	0.62%
February	0.92%	0.36%
March	0.11%	0.42%
April	0.45%	-0.10%
May	1.31%	0.04%
June	0.98%	0.35%
July	1.08%	0.26%
August	0.45%	-0.87%
September	-0.49%	-0.22%
October	1.20%	0.20%
November	0.67%	0.03%
December	0.75%	-0.26%
<b>Average</b>	0.64%	0.07%
<b>T-Test</b>	0.006	

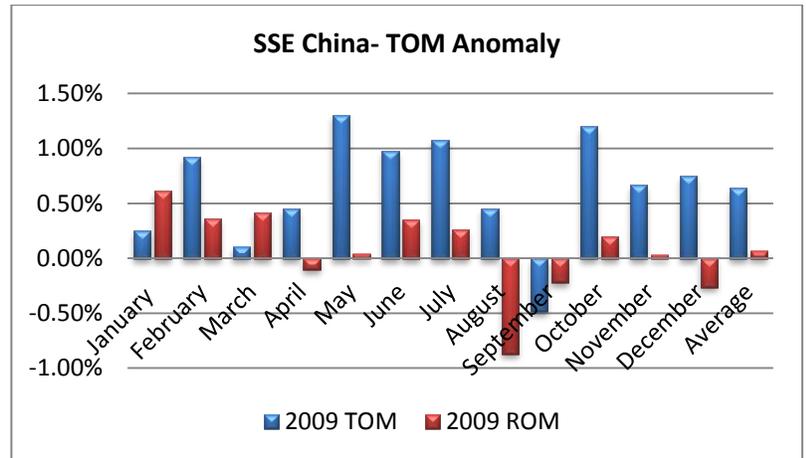


Table 6: A summary of descriptive statistics for examining the TOM anomaly for 2010:

2010		
Month	TOM	ROM
January	-0.10%	-0.48%
February	0.05%	0.10%
March	0.01%	0.19%
April	0.13%	-0.55%
May	-1.27%	-0.09%
June	-0.66%	-0.06%
July	-0.85%	0.56%
August	-0.08%	-0.02%
September	0.54%	-0.25%
October	1.52%	0.46%
November	0.49%	-0.45%
December	-0.08%	-0.28%
<b>Average</b>	-0.03%	-0.07%
<b>T-Test</b>	0.842	

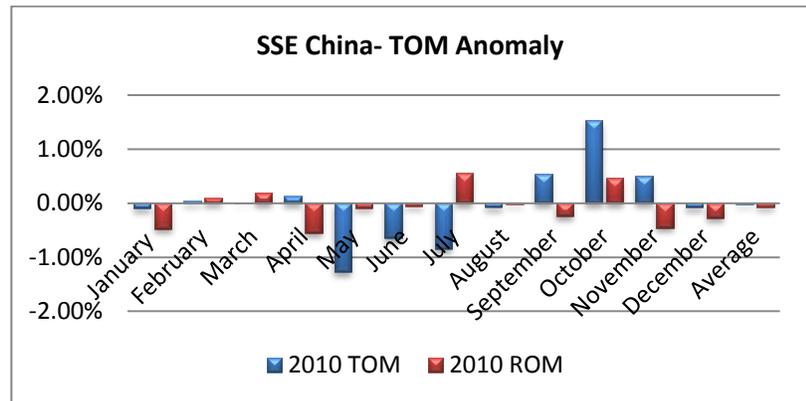
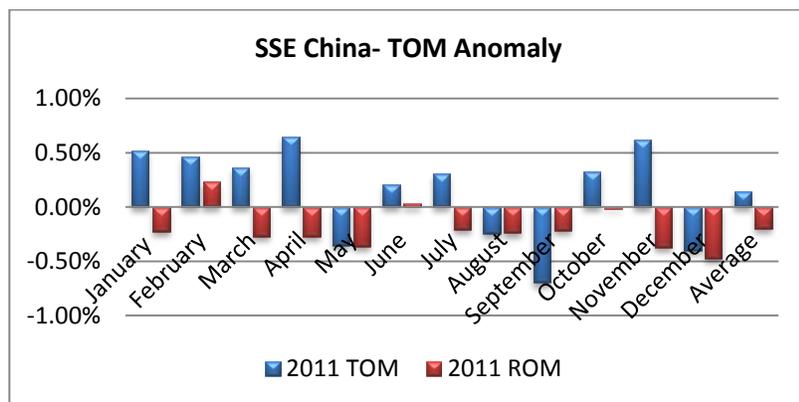


Table 7: A summary of descriptive statistics for examining the TOM anomaly for 2011:

2011		
Month	TOM	ROM
January	0.52%	-0.23%
February	0.47%	0.23%
March	0.37%	-0.27%
April	0.65%	-0.27%
May	-0.35%	-0.37%
June	0.21%	0.04%
July	0.31%	-0.21%
August	-0.24%	-0.24%
September	-0.70%	-0.22%
October	0.32%	-0.01%
November	0.62%	-0.37%
December	-0.40%	-0.47%
<b>Average</b>	0.15%	-0.20%
<b>T-Test</b>	0.028	



#### Appendix (4)

Detailed descriptive statistics are provided for 7 years, examining the turn-of-the-month (TOM) anomaly in Bovespa Index:

Table 1: A summary of descriptive statistics for examining the TOM anomaly for 2005:

2005		
Month	TOM	ROM
January	0.38%	-0.10%
February	1.14%	0.83%
March	0.44%	-0.76%
April	-0.10%	-0.13%
May	0.13%	-0.05%
June	0.20%	-0.07%
July	-0.50%	0.22%
August	0.73%	0.20%
September	0.87%	0.55%
October	-1.15%	-0.02%
November	1.01%	0.09%
December	0.96%	0.02%
<b>Average</b>	0.34%	0.07%
<b>T-Test</b>	0.235121716	

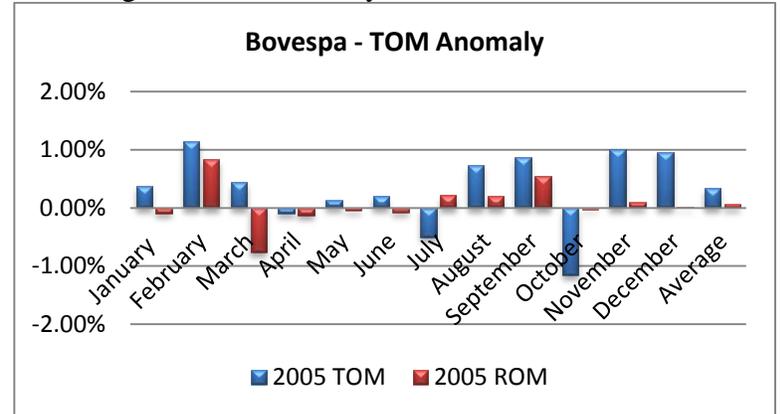


Table 2: A summary of descriptive statistics for examining the TOM anomaly for 2006:

2006		
Month	TOM	ROM
January	0.76%	0.53%
February	-0.22%	0.20%
March	0.05%	-0.13%
April	0.78%	0.24%
May	0.41%	-0.51%
June	-0.71%	-0.32%
July	0.79%	0.06%
August	0.43%	-0.25%
September	0.19%	-0.12%
October	0.84%	0.23%
November	0.71%	0.00%
December	0.81%	0.05%
<b>Average</b>	0.40%	0.00%
<b>T-Test</b>	0.024431447	

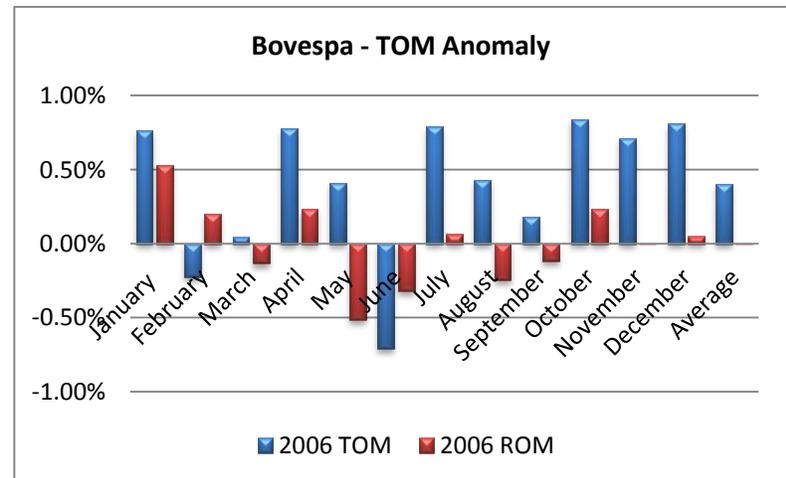


Table 3: A summary of descriptive statistics for examining the TOM anomaly for 2007:

2007		
Month	TOM	ROM
January	-0.53%	0.21%
February	0.67%	0.16%
March	-1.12%	0.18%
April	0.79%	0.36%
May	0.41%	0.18%
June	0.11%	0.28%
July	0.54%	-0.37%
August	0.05%	-0.04%
September	0.57%	0.69%
October	0.19%	0.46%
November	-0.40%	-0.22%
December	1.07%	-0.38%
<b>Average</b>	0.20%	0.13%
<b>T-Test</b>	0.73279767	

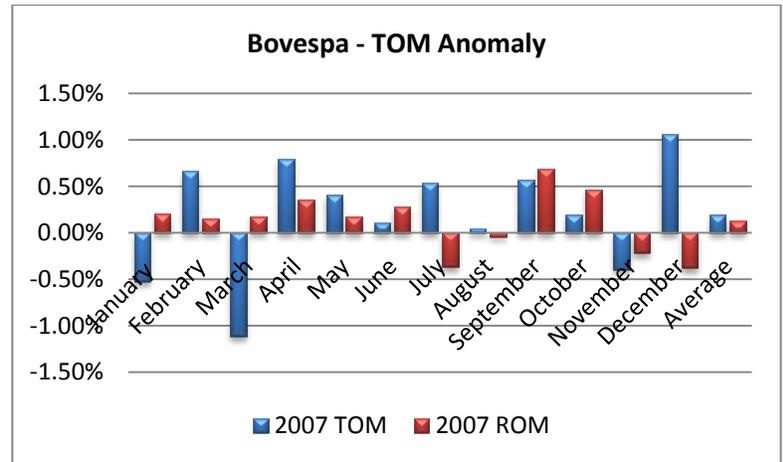


Table 4: A summary of descriptive statistics for examining the TOM anomaly for 2008

2008		
Month	TOM	ROM
January	-0.94%	-0.14%
February	-0.13%	0.86%
March	-0.65%	-0.26%
April	0.98%	0.12%
May	0.83%	0.42%
June	-0.44%	-0.72%
July	-1.24%	-0.14%
August	-0.14%	-0.24%
September	-1.28%	-0.08%
October	-3.12%	-1.11%
November	0.71%	0.02%
December	-0.63%	0.29%
<b>Average</b>	-0.51%	-0.08%
<b>T-Test</b>	0.253462746	

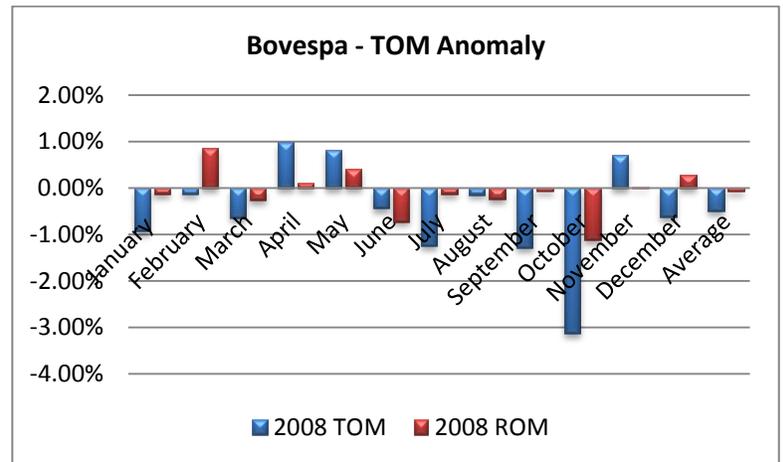


Table 5: A summary of descriptive statistics for examining the TOM anomaly for 2009:

2009		
Month	TOM	ROM
January	1.70%	-0.10%
February	0.36%	-0.61%
March	-0.38%	0.72%
April	0.88%	0.26%
May	1.47%	0.24%
June	0.53%	-0.25%
July	-0.28%	0.37%
August	0.62%	0.23%
September	-0.31%	0.50%
October	0.36%	-0.27%
November	1.15%	0.23%
December	0.30%	0.00%
<b>Average</b>	0.53%	0.11%
<b>T-Test</b>	0.07452456	

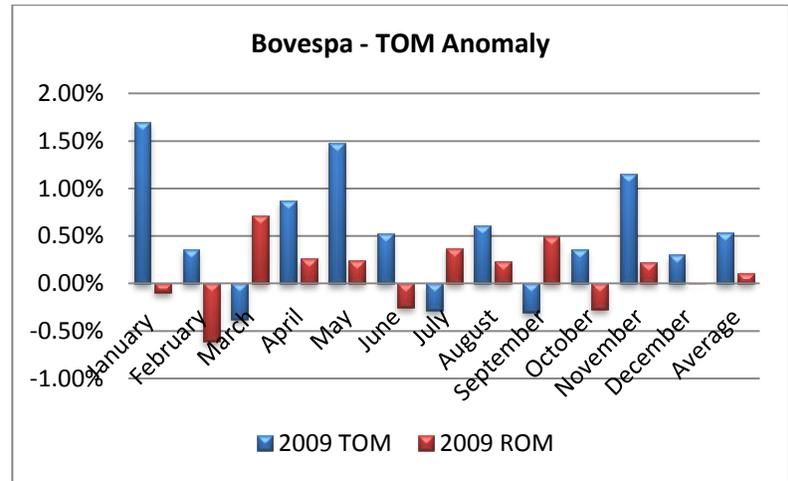


Table 6: A summary of descriptive statistics for examining the TOM anomaly for 2010:

2010		
Month	TOM	ROM
January	0.61%	-0.61%
February	-0.29%	0.24%
March	0.50%	0.18%
April	0.20%	-0.43%
May	-0.83%	-0.14%
June	-0.25%	0.32%
July	-0.57%	0.49%
August	0.40%	-0.26%
September	0.29%	0.24%
October	0.31%	0.00%
November	0.48%	-0.45%
December	0.32%	-0.18%
<b>Average</b>	0.10%	-0.05%
<b>T-Test</b>	0.391232988	

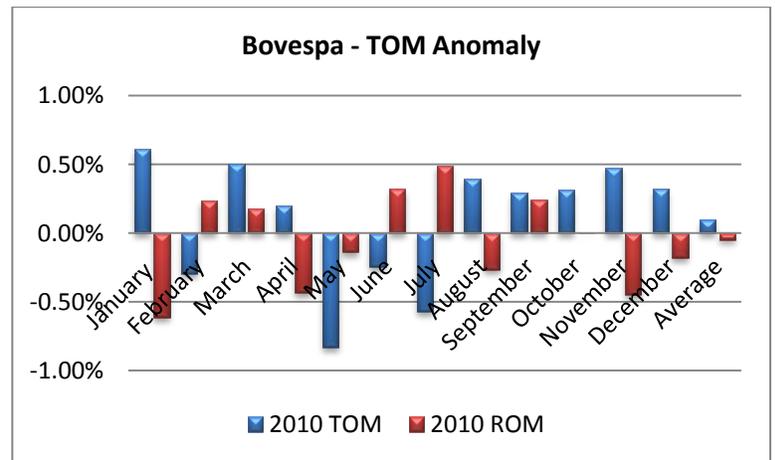
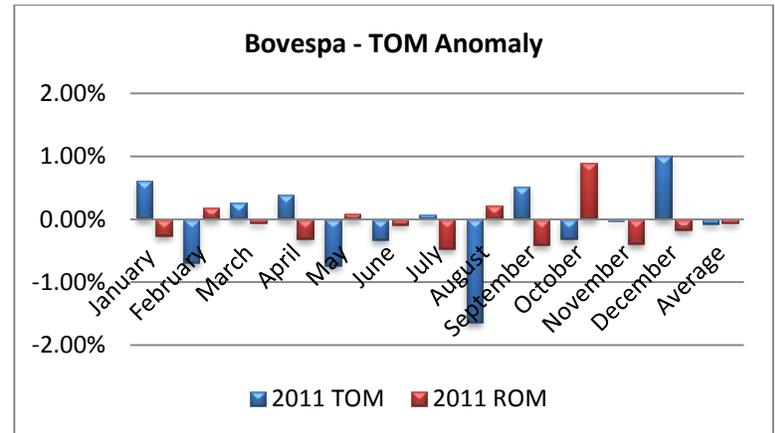


Table 7: A summary of descriptive statistics for examining the TOM anomaly for 2011:

2011		
Month	TOM	ROM
January	0.61%	-0.26%
February	-0.70%	0.18%
March	0.26%	-0.06%
April	0.40%	-0.32%
May	-0.74%	0.09%
June	-0.32%	-0.08%
July	0.07%	-0.47%
August	-1.65%	0.22%
September	0.52%	-0.41%
October	-0.31%	0.90%
November	-0.02%	-0.40%
December	1.02%	-0.17%
<b>Average</b>	-0.07%	-0.06%
<b>T-Test</b>	0.898051627	



## Appendix (5)

Detailed descriptive statistics are provided for 7 years, examining the turn-of-the-month (TOM) anomaly in FTSE-JSE Index:

Table 1: A summary of descriptive statistics for examining the TOM anomaly for 2005:

2005		
Month	TOM	ROM
January	0.13%	0.03%
February	0.32%	0.02%
March	0.23%	-0.16%
April	0.11%	-0.24%
May	0.35%	0.14%
June	0.00%	0.13%
July	0.44%	0.05%
August	0.19%	-0.08%
September	0.38%	0.15%
October	-0.37%	-0.23%
November	0.77%	0.10%
December	0.20%	0.10%
<b>Average</b>	0.23%	0.00%
<b>T-Test</b>	0.020	

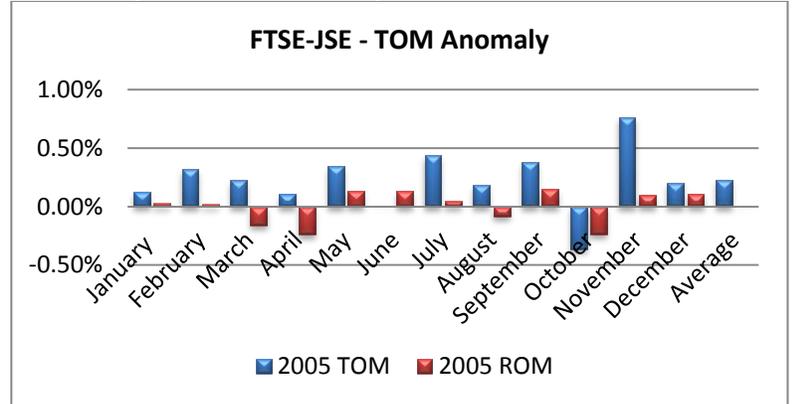


Table 2: A summary of descriptive statistics for examining the TOM anomaly for 2006:

2006		
Month	TOM	ROM
January	0.32%	0.09%
February	-0.01%	0.11%
March	0.11%	0.07%
April	0.24%	0.07%
May	0.00%	-0.35%
June	-0.41%	0.02%
July	0.58%	0.03%
August	-0.10%	0.02%
September	0.15%	0.02%
October	0.23%	0.16%
November	0.18%	-0.17%
December	0.24%	0.14%
<b>Average</b>	0.13%	0.02%
<b>T-Test</b>	0.192	

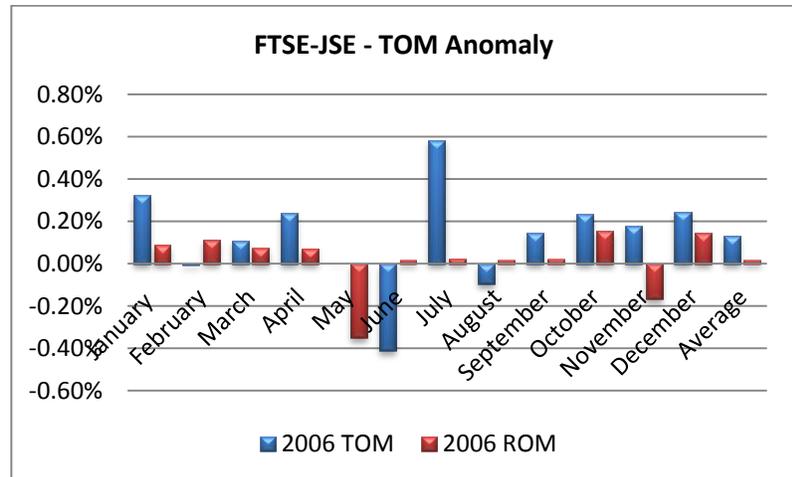


Table 3: A summary of descriptive statistics for examining the TOM anomaly for 2007:

2007		
Month	TOM	ROM
January	-0.04%	0.01%
February	0.32%	0.10%
March	-0.80%	0.16%
April	0.36%	0.08%
May	0.34%	-0.01%
June	-0.24%	-0.04%
July	0.32%	-0.41%
August	-0.06%	-0.06%
September	0.51%	0.07%
October	0.34%	0.13%
November	-0.54%	-0.22%
December	0.37%	0.00%
<b>Average</b>	0.07%	-0.02%
<b>T-Test</b>	0.500	

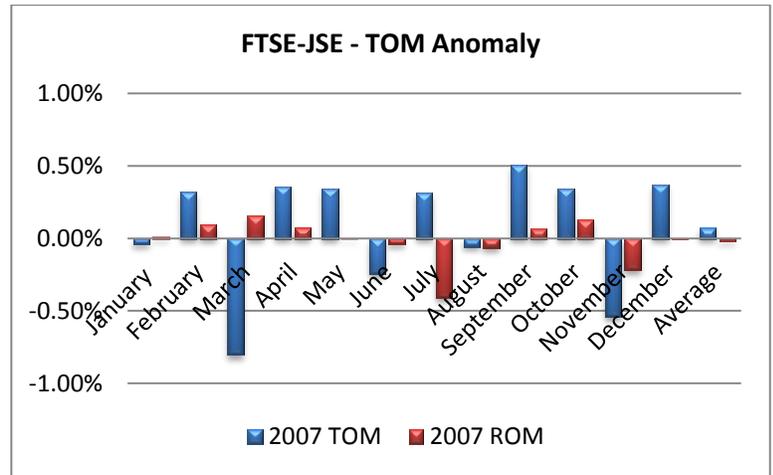


Table 4: A summary of descriptive statistics for examining the TOM anomaly for 2008

2008		
Month	TOM	ROM
January	-0.47%	-0.42%
February	-0.02%	0.24%
March	-0.83%	-0.07%
April	0.60%	0.13%
May	0.47%	-0.23%
June	-0.19%	-0.56%
July	-0.43%	-0.07%
August	0.55%	0.05%
September	-0.42%	-0.37%
October	-1.72%	-0.57%
November	0.27%	-0.28%
December	0.03%	0.15%
<b>Mean</b>	-0.18%	-0.17%
<b>T-Test</b>	0.950	

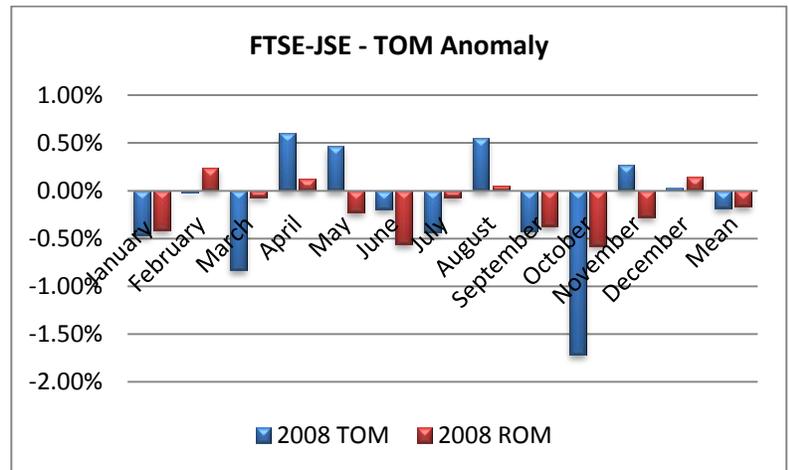


Table 5: A summary of descriptive statistics for examining the TOM anomaly for 2009:

2009		
Month	TOM	ROM
January	0.75%	-0.33%
February	-0.24%	-0.64%
March	-1.30%	0.59%
April	0.52%	0.18%
May	1.24%	-0.01%
June	-0.07%	-0.21%
July	-0.18%	0.46%
August	0.62%	0.25%
September	-0.04%	0.38%
October	-0.07%	-0.09%
November	0.16%	0.06%
December	0.42%	0.09%
<b>Average</b>	0.15%	0.06%
<b>T-Test</b>	0.673	

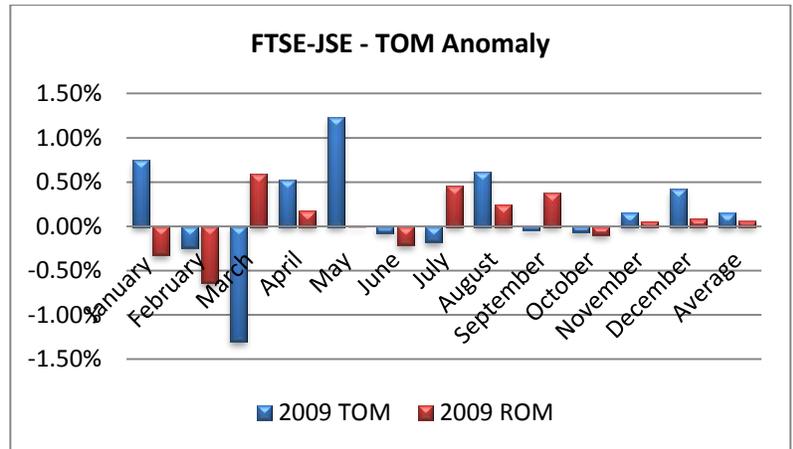


Table 6: A summary of descriptive statistics for examining the TOM anomaly for 2010:

2010		
Month	TOM	ROM
January	0.31%	-0.39%
February	-0.22%	0.25%
March	0.55%	0.21%
April	0.04%	-0.14%
May	-1.42%	0.10%
June	-0.20%	-0.05%
July	-0.34%	0.41%
August	0.16%	-0.27%
September	0.89%	0.16%
October	0.32%	-0.03%
November	0.57%	-0.20%
December	0.33%	0.28%
<b>Average</b>	0.08%	0.03%
<b>T-Test</b>	0.766	

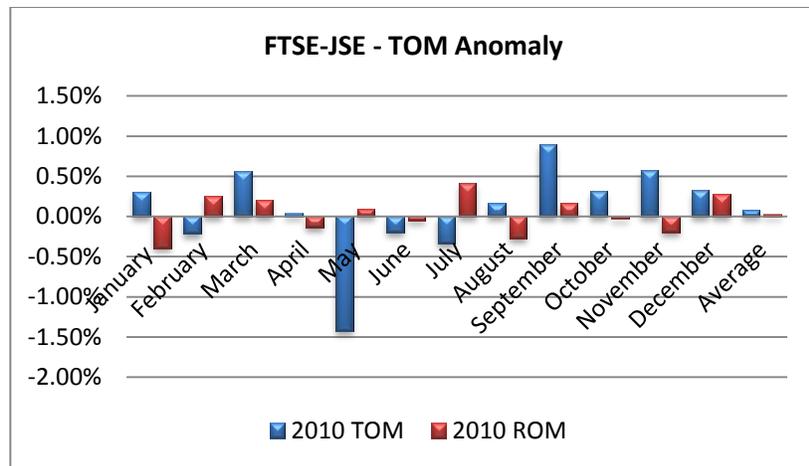
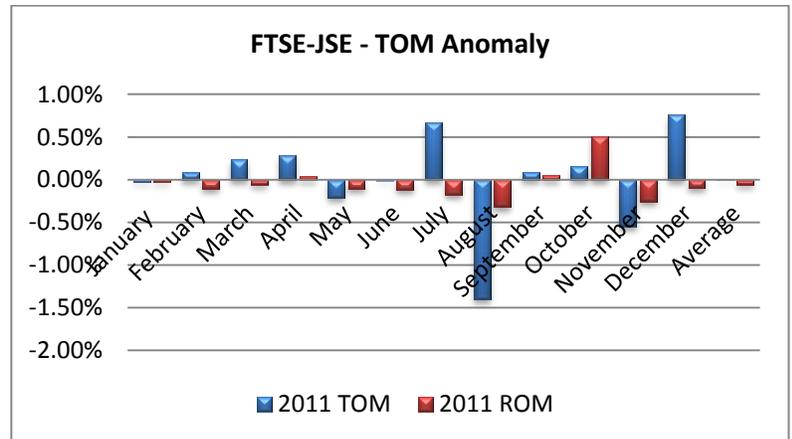


Table 7: A summary of descriptive statistics for examining the TOM anomaly for 2011:

2011		
Month	TOM	ROM
January	-0.02%	-0.02%
February	0.08%	-0.10%
March	0.23%	-0.06%
April	0.29%	0.04%
May	-0.21%	-0.10%
June	-0.01%	-0.12%
July	0.67%	-0.18%
August	-1.40%	-0.32%
September	0.09%	0.05%
October	0.16%	0.51%
November	-0.55%	-0.26%
December	0.76%	-0.10%
<b>Average</b>	0.01%	-0.05%
<b>T-Test</b>	0.727	



## Appendix (6)

Seven-year annual descriptive statistics of the five indices are provided in the five tables below as part of the turn-of-the-month (TOM) analysis.

Table 1: A summary of descriptive statistics for CNX Nifty Index:

<b>Year</b>	<b>TOM</b>	<b>ROM</b>
<b>2011</b>	0.157%	-0.219%
<b>2010</b>	0.210%	-0.021%
<b>2009</b>	0.213%	0.252%
<b>2008</b>	-0.137%	-0.376%
<b>2007</b>	0.005%	0.236%
<b>2006</b>	0.297%	0.084%
<b>2005</b>	0.309%	0.041%
<b>Average return</b>	<b>0.1506%</b>	<b>-0.0002%</b>
<b>t test</b>	<b>0.1848</b>	

Table 2: A summary of descriptive statistics for RTS Russia Index:

<b>Year</b>	<b>TOM</b>	<b>ROM</b>
<b>2011</b>	-0.019%	-0.109%
<b>2010</b>	0.321%	-0.052%
<b>2009</b>	0.411%	0.246%
<b>2008</b>	-0.566%	-0.522%
<b>2007</b>	0.119%	0.073%
<b>2006</b>	0.395%	0.140%
<b>2005</b>	0.467%	0.154%
<b>Average return</b>	<b>0.1611%</b>	<b>-0.0098%</b>
<b>t test</b>	<b>0.3333</b>	

Table 3: A summary of descriptive statistics for SSE Index:

<b>Year</b>	<b>TOM</b>	<b>ROM</b>
<b>2011</b>	0.147%	-0.199%
<b>2010</b>	-0.025%	-0.071%
<b>2009</b>	0.640%	0.069%
<b>2008</b>	-0.133%	-0.536%
<b>2007</b>	-0.178%	0.452%
<b>2006</b>	0.326%	0.284%
<b>2005</b>	-0.058%	-0.027%
<b>Average return</b>	<b>0.1028%</b>	<b>-0.0039%</b>
<b>t test</b>	<b>0.5291</b>	

Table 4: A summary of descriptive statistics for Bovespa Index:

<b>Year</b>	<b>TOM</b>	<b>ROM</b>
<b>2011</b>	-0.071%	-0.064%
<b>2010</b>	0.098%	-0.049%
<b>2009</b>	0.534%	0.110%
<b>2008</b>	-0.505%	-0.081%
<b>2007</b>	0.196%	0.126%
<b>2006</b>	0.404%	-0.002%
<b>2005</b>	0.343%	0.065%
<b>Average return</b>	<b>0.1427%</b>	<b>0.0148%</b>
<b>t test</b>	<b>0.3790</b>	

Table 5: A summary of descriptive statistics FTSE-JSE Index:

<b>Year</b>	<b>TOM</b>	<b>ROM</b>
<b>2011</b>	0.009%	-0.053%
<b>2010</b>	0.083%	0.027%
<b>2009</b>	0.152%	0.062%
<b>2008</b>	-0.181%	-0.168%
<b>2007</b>	0.073%	-0.015%
<b>2006</b>	0.129%	0.017%
<b>2005</b>	0.228%	-0.001%
<b>Average return</b>	<b>0.0704%</b>	<b>-0.0187%</b>
<b>t test</b>	<b>0.1493</b>	

## Appendix (7)

Seven-year annual descriptive statistics of the five indices are provided in the five tables below as part of the January analysis.

Table 1: A summary of descriptive statistics for CNX Nifty Index:

<b>CNX Nifty</b>			
<b>Year</b>	<b>January</b>	<b>Other 11 Months</b>	<b>Different</b>
<b>2005</b>	-0.053%	0.134%	Negative
<b>2006</b>	0.256%	0.122%	Positive
<b>2007</b>	0.144%	0.179%	Negative
<b>2008</b>	-0.774%	-0.250%	Negative
<b>2009</b>	-0.145%	0.272%	Negative
<b>2010</b>	0.039%	0.072%	Negative
<b>2011</b>	-0.541%	-0.084%	Negative
<b>Average</b>	<b>-0.1531%</b>	<b>0.0636%</b>	
<b>t test</b>		<b>0.1894</b>	

Table 2: A summary of descriptive statistics for RTS Russia Index:

<b>RTS Russia</b>			
<b>Year</b>	<b>January</b>	<b>Other 11 Months</b>	<b>Different</b>
<b>2005</b>	0.176%	0.238%	Negative
<b>2006</b>	0.710%	0.160%	Positive
<b>2007</b>	-0.247%	0.094%	Negative
<b>2008</b>	-1.078%	-0.482%	Negative
<b>2009</b>	-0.979%	0.416%	Negative
<b>2010</b>	0.133%	0.077%	Positive
<b>2011</b>	0.366%	-0.130%	Positive
<b>Average</b>	<b>-0.131%</b>	<b>0.053%</b>	
<b>t test</b>		<b>0.4791</b>	

Table 3: A summary of descriptive statistics for SSE Index:

<b>SSE China</b>			
<b>Year</b>	<b>January</b>	<b>Other 11 Months</b>	<b>Different</b>
<b>2005</b>	-0.289%	-0.011%	Negative
<b>2006</b>	0.365%	0.317%	Positive
<b>2007</b>	0.177%	0.267%	Negative
<b>2008</b>	-0.794%	-0.382%	Negative
<b>2009</b>	0.595%	0.219%	Positive
<b>2010</b>	-0.460%	-0.028%	Negative
<b>2011</b>	-0.031%	-0.116%	Positive
<b>Average</b>	<b>-0.063%</b>	<b>0.038%</b>	
<b>t test</b>		<b>0.7194</b>	

Table 4: A summary of descriptive statistics for Bovespa Index:

<b>Bovespa</b>			
<b>Year</b>	<b>January</b>	<b>Other 11 Months</b>	<b>Different</b>
<b>2005</b>	-0.365%	0.139%	Negative
<b>2006</b>	0.654%	0.065%	Positive
<b>2007</b>	0.018%	0.160%	Negative
<b>2008</b>	-0.339%	-0.202%	Negative
<b>2009</b>	0.217%	0.246%	Negative
<b>2010</b>	-0.250%	0.025%	Negative
<b>2011</b>	-0.201%	-0.070%	Negative
<b>Average</b>	<b>-0.0381%</b>	<b>0.0521%</b>	
<b>t test</b>		<b>0.8298</b>	

Table 5: A summary of descriptive statistics FTSE-JSE Index:

<b>FTSE-JSE</b>			
<b>Year</b>	<b>January</b>	<b>Other 11 Months</b>	<b>Different</b>
<b>2005</b>	0.063%	0.066%	Negative
<b>2006</b>	0.134%	0.041%	Positive
<b>2007</b>	-0.014%	0.010%	Negative
<b>2008</b>	-0.415%	-0.132%	Negative
<b>2009</b>	-0.290%	0.120%	Negative
<b>2010</b>	-0.185%	0.060%	Negative
<b>2011</b>	-0.030%	-0.032%	Positive
<b>Average</b>	<b>-0.1052%</b>	<b>0.0191%</b>	
<b>t test</b>		<b>0.0982</b>	

This index includes seven-year price charts of the five indices.

Figure (1): Price chart ofCNX Nifty Index:

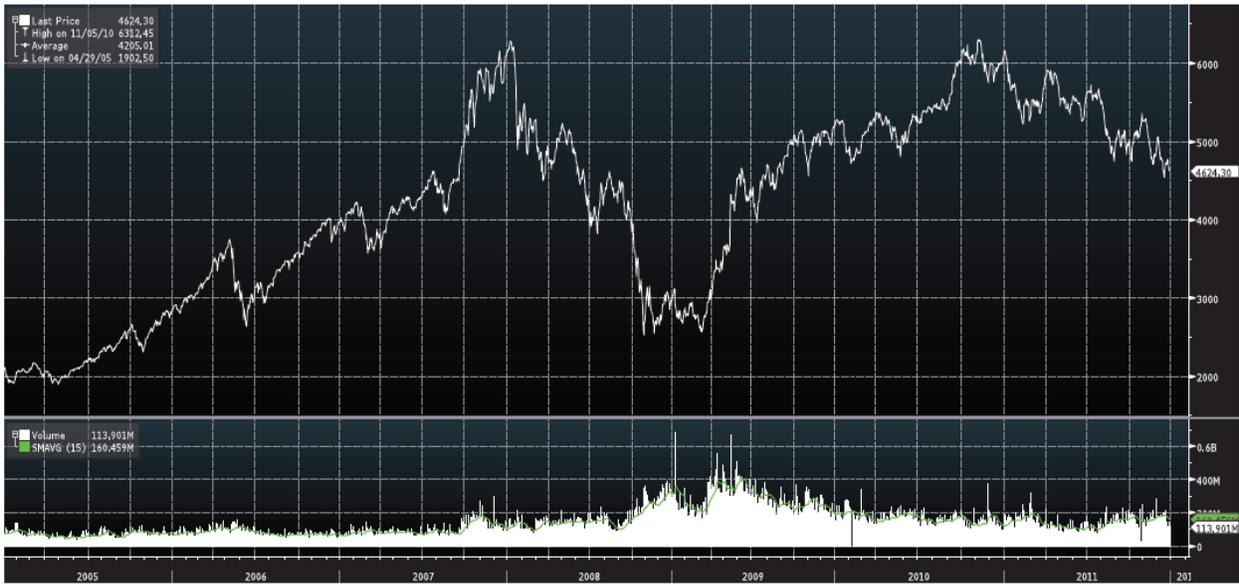


Figure (2): Price chart ofRTS Russia Index:

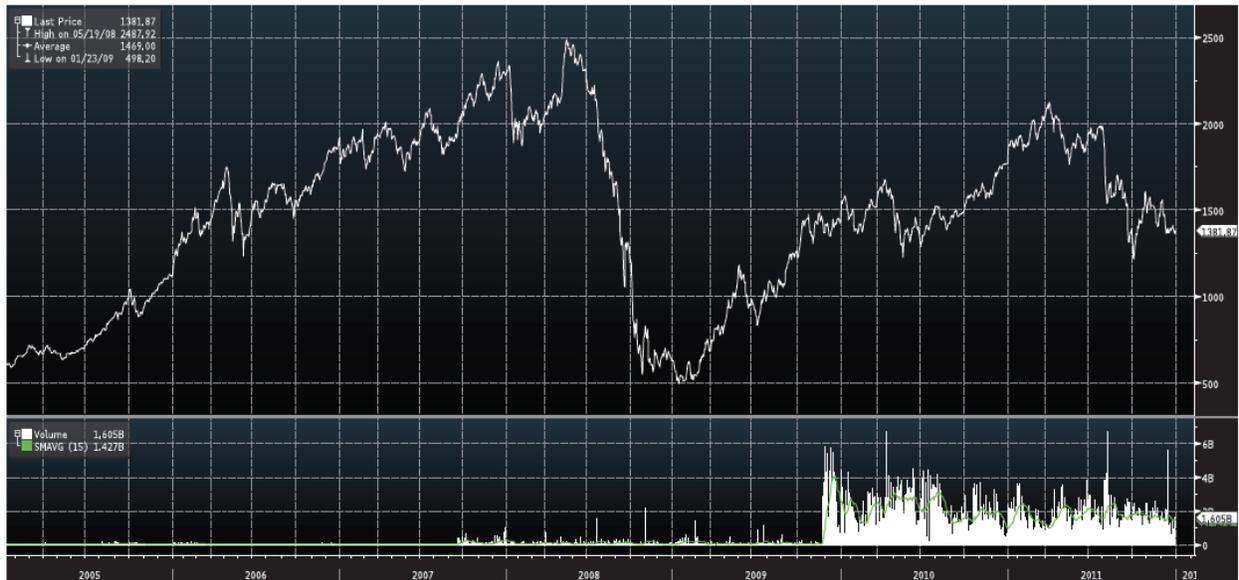


Figure (3): Price chart ofSSE Index:

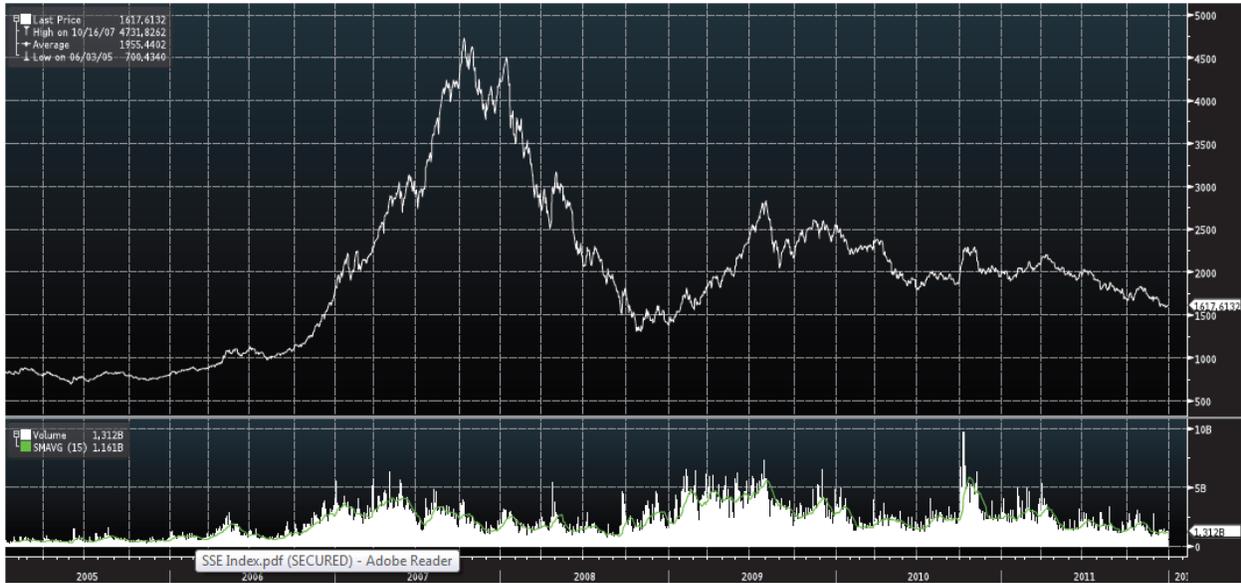


Figure (4): Price chart ofBovespa Index:



Figure (5): Price chart ofFTSE-JSE Index:

