The Study of Holiday Effect and Stock Returns in Thailand

By

CHANGrong CHEN

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of

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Graduate School of Business
Assumption University
Bangkok Thailand

August, 2001
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ABSTRACT

Stock returns and the influencing factors had been widely studied in many countries for a long time. Some researchers suggest there is holiday effect, which will induce the abnormal stock returns on pre-holidays (Kim & Park 1994 US stock market), some found there is reserve size impact, when size decreased, the return increased (Robert A. Ariel 1990)

In contrast, there are also augments according to the market efficiency theory. Which insist the stock prices be adjusted to the infusion of new information, the movement has no trend and therefore, regardless the holiday effects.

There are some studies in Thailand had been conducted to study the stock price behavior of SET according the market efficiency theory. Panadda Dtantralertpab (1978) & Chamman Monglolkasem (1978) found the previous price changes are useless in predicting future price or return changes. The sequence of the stock prices is independent. Jane Prasitlumkun (1983) & Piyawadi (1991) in contrast, found the sequence of the stock prices is dependent.

However, there is no study have been done in concern of the holiday effect and stock returns in SET. Thus, this research is aimed to identify whether Thai stock market is consistent with market efficient theory. To prove whether the holiday effect exist, if so, further more, to disclosure the relationship between
Firm Size and the Holiday Effect, to identify the relationships between the Holiday Effect and the Stock returns.

This study was conducted on the base of SET index from 1993 to 1999. Holiday will be focused on Songkhan and New Year’s day since they provoke the longest holiday during a year and thus, it might induce the important influence to stock returns. The t-statistic is used to disclose the relationship between holiday effect and stock returns. The F-statistic is conducted to test the firm size impact on holiday effect.

The results of this research indicated that, overall there is NO holiday effect exists in Thai stock market was found by analyzing the mean return on ordinary day and mean return on pre-holiday as a whole. Small holiday effect was presented when further analyzing across the size decile portfolio: There is pre-NewYear’s day effect found in portfolio 3; both pre-Songkhan’s day effect & pre-NewYear’s day effect presented only in portfolio 8. There is Size impact, means, and different firm response differently to holidays across size portfolio but such a impact does NOT have systematic pattern. Therefore. The Thai stock market performance follows the market efficiency theory.

The conclusion of this study may be used as significant references for all stock sectors, to better develop the performance of police maker, to help the investors’ decision making, to provide the evidence for academic researchers in their studying.
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CHAPTER 1 GENERALITIES OF THE STUDY

1.1 Introduction of the Study:

Stock returns, generally from the investor's point of view, are cash dividends received during the period at capital appreciation or loss. However, in this study, from a more broad point of view, it is calculated as: minus closed SET Index of previous day by closed SET Index of present day, then divide it by closed SET Index of previous day.

SET Index is a composite index calculated from stock prices on the main board. It is a market capitalization weighted price index, which compares the current market value of all listed common shares with the value on a base date of April 30, 1975, when the SET Index was first begun and set at 100 points. Its calculation is adjusted in line with new listings, delistings, and capitalization changes.

The stock returns, which calculated based upon the value weighted SET index, are defined as value-weighted adjusted throughout all of this research.
Holiday effect is the influence of certain holidays on stock returns. Generally, there is a disproportional return in stock on the last trading day prior major holidays compare with ordinary trading day.

The reasons are various:

*For cash purpose:* Many investors will need extra money for their holiday usage. Thus, there are more sellers on pre-holiday, the price of stock turns down due to over supply, that is the good time for other investors whom holding extra cash to buy at low and sell it when the stock goes up after the holiday. Obviously, the stock market tends to be more active than usual.

*For tax-loss purpose:* Many investors reported a very good financial income by the end of the year, which required a large tax payment. Some investors will choose to sell the stock at a low price to window dressing their overall performance and further to reduce their tax paying. That is also one reason stimulating the stock market’s active.

The holiday effects are different across the different countries through the different patterns, but some empirical studies suggest that, there are certain international linkages in between. (Chan-Wung Kim and Jinwoo Park <Holiday Effect and Stock Returns>)
Some previous studies also suggested different firm response differently in holiday effects and further affect stock returns, according to their firm size. (Robert A. Ariel <High Stock Returns before Holidays>) Generally, the small-firm stocks exhibit more distinct holiday effects than large-firm stocks. Furthermore, the reverse firm size effect is also observed for stock returns in some markets, as the size of firm decreases, the stock returns tend to be higher.

There are also arguments according market efficiency theory, which suggest the stock prices are adjusted to the infusion of new information, the movement has no trend.

1.1.a Holiday Effect and Stock Returns in the literature

Holiday effect in stock returns exists in many markets with different patterns, though each country has different holidays and institutional arrangements. Stock market exhibits a strong holiday effect in the United States, there are abnormally high returns on the trading day before holidays in all three of the major stock markets. The holiday effect is also present in the U.K. and Japanese stock markets.
To test the holiday effect, Jim and Park (1994) conducted study <The holiday Effects and Stock Returns>. By analyzing daily value-weighted market returns for the all three major stock markets in the U.S.: NYSE, AMEX and NASDAQ, from the year 1963 to 1986. (1973-1986 for the NASDAQ returns), they found there are abnormally high returns on the trading day before holidays in the U.S stock market. At the year 1990, Robert A. Ariel, conducted the study <High Stock Returns before Holidays in the U.S>. The results showed that the mean of the Pre-Holiday returns exceed the means of the Non Pre-holiday returns by nine to fourteen times for the equally- and value-weighted indices.

The study related to the firm size and holiday effect in the U.S. also disclosure that, the small firms usually have more distinct holiday effect in stock returns than large-firms. In Japanese stock market, a reversal size effect is also observed for the stock returns.

To investigate the firm size impact on holiday effect, Kim and Park (1994) conducted the regression analysis with dummy variable for testing incremental pre-holiday effect across size decile portfolios after controlling for the Day-of-the-Week effect and the Pre-New-Year’s-Day Effect. The result shows that the mean returns on small firm portfolios are high on post-holidays in the U.S. stock market. Kihoshi Kato (1990) also studied the size effect by conducting the regression analysis, by comparing the mean portfolio returns by
week and firm size during the sample period, the results showed that both size and reversal size effect are existing in the Japanese market.

Unfortunately, there’s no investigation, which related holiday effect had been done about Thai stock market. Thus, this research is conducted to test whether the seasonality exists and whether there are any relationship exists between firm size and the holiday effect, whether there are any relationship exists between holiday effect and the stock returns.

1.1.b Background of SET:

Three SET related issues will be discussed below, which are (1) Returns on SET (2) Performance and Trend of SET (3) Holidays in Thailand and Holidays on SET (4) Size-Analysis of Listing Firms on SET

(1) Returns on SET

Returns on SET are calculated based on SET Indices. There are three major SET indices, SET index, SET 50 Index, Sectoral Indices.

- *SET Index* shows the daily price movement of all securities traded on the Stock Exchange of Thailand (SET) on the current date compared
with that of the base date, which is April 30, 1975 – the first day of the SET operations. The SET Index calculation is as follows:

\[
\text{SET Index} = \frac{\text{Market capitalization of all listed common stocks on the present trading day}}{\text{Market capitalization of all listed common stocks on the base day (April 30, 1975)}} \times 100
\]

\(\text{SET 50 Index}\) shows the daily price movement of top 50 listed common stocks with large market capitalization and consistent high liquidity on the current date compared with that of the base date, which is August 16, 1995 – when the SET 50 Index was launched. The SET 50 Index calculation is as follows:

\[
\text{SET 50 Index} = \frac{\text{Market capitalization of 50 top listed common stocks on the present trading day}}{\text{Market capitalization of 50 top listed common stocks on the base day (April 30, 1975)}} \times 100
\]

\(\text{Sectoral Indices}\) show the price movements of all common stocks traded in each industrial sector.

Returns on SET are based on the way how SET Index calculated, here, as the value-weighted market method is used, which means, each stock is given a weighting proportional to its market capitalization. Thus, value weighted
market return are conducted to best capture total economic activity and changes in valuation of the companies in the index.

By giving larger companies higher weighting, the value-weighted market return better reflects the fact that large companies have larger effect on economic activity than change in smaller companies.

The value-weighted market return is calculated by:

\[
\frac{\text{SET Index of present day} - \text{SET Index of previous day}}{\text{SET Index of previous day}}
\]

(2) Performance and Trend of SET

At the end of its first year of operation, there were just 21 SET-listed companies and total trading turnover topped 547.32 million baht in Stock Exchange of Thailand.

On January 4 1994, the market opened at an historic high of 1753.73 Index points and the following day recorded its highest-level trading turnover of 40.01 billion baht. In 1999, the SET Index closed at 481.92 with the total turnover value 1,609.79 billion baht on a daily average of 6,570.56 million baht.
 Those original 21 listed companies have grown to 420 stocks and have been joined by 20 unit trusts or mutual funds as well as preferred shares, debentures and warrants of various type - a total of 450 securities ended December 1999. Market capitalization has changed since the First Boom years of 1986-89 to value of Dec 1999 equal to 2,193.07 billion baht.

This remarkable rate of growth has been in parallel with the SET’s own historic progress and initiatives. The Automated Trading System for the SET (ASSET) was implemented in May 1991, while in June 1992, the SET’s Share Depository Centre adopted a scripless system which now includes debentures and warrants. In July 1992, trading hours were extended to two sessions, morning and afternoon.

As a result of such rapid progress, foreign trading on the SET more than doubled between 1991 and 1992, continuing an upward trend to account for over 940 billion baht in 1999, approximately 29.44% of total trading turnover.

(3) Holidays in Thailand and Holidays on SET

There are various local holidays in Thailand, which mainly divided into three major groups, which are: 1. Government Holidays  2. Bank’s Holidays  3. Religious Day
1. **Government Holidays**, that all the organizations are required to close during that period, for those that need to work on those days, the organization are required to pay the extra over time to their employees/workers.

2. **Bank’s Holiday**, such as Midyear Bank’s Holiday, which means only Banks are closed while all other organizations are still open as usual.

3. **Religious Day**, which affect the Thai life a lot, such as Makha Bucha Day, Chakree Day etc. Those Buddhist holidays are determined by the Buddhist lunar calendar and are therefore variable.

For Stock Exchange of Thailand, during the sample period of Jan 1993 to December 1999, it will be closed for all government holidays, that contain Saturday, Sunday and all banks holidays, which listed as below:

1. Regular Holidays:
   - Saturday & Sunday
   - Jan 1 New Years Day
   - April 13 Sonkran Day
   - May 1 National Labor’s Day
   - May 5 Coronation Day
   - July 1 Midyear Bank’s Day
10

Aug 12  H.M. The Queen's Birthday  
Oct 23  Chulalongkorn Day  
Dec 5  H.M. The King's Birthday  
Dec 10  Constitution Day  
Dec 31  New Year's Eve

2. Religious Day, which variance for each year:

Lunar Jan 16  Makha Bucha Day  
Lunar Mar 13  Chakree Day  
Lunar April 15  Visakha Bucha Day

Among above holidays, the Songkran Day and the New Year's Day will be selected as the major base of “Holiday Effects” of this research, because both Songkran and New Year’s Day provoke the longest SET closing and therefore, might induce the important effects to the Stock Returns.
(4) Size Analysis of Listing Firms on SET

For the firms that were listed on the SET and had returns on the SET, they enter or leave the stock market due to mergers, bankruptcies, delistings and new listings each year. The number of sample firms start from 21 in 1975 to 420 in 1999. The market value will be the base for the firm size analyzes of the year 1975. The market capitalization will be conducted in the firm size analysis during the sample period of Jan 1993 to Dec 1999.

By the year-end of 1975, there are only 21 securities listed in the stock market. The largest is BBL (Bangkok Bank Public Co., Ltd), occupied 78.6% of total market value, number of shares of 1,476,165, market value of 428.41 million baht. The second security large security is SCC (The Siam Cement Public Co., Ltd), hold 10.7% of total market value, number of share of 389,664, market value of 58.31 million baht. The smallest is DTC (Dusit Thani Public Co., Ltd), which took only 0.05% of total market value, with 1600 shares, 0.26 million baht market capitalization.

By the year-end of 1993, the number of securities had been increased to 347. TA (Telecomasia Corporation Public Co., Ltd.) ranked at the top, with 10.46% of total market capitalization, 340,119 million baht market capitalization. The second is BBL (Bangkok Bank Public Co., Ltd.), with 6.71%
of total market capitalization, 218,000 million market capitalizations. The smallest firm UV (Univentures Public Co, Ltd.) with below 0.01% of total market capitalization, 175 million baht market capitalization.

By the year-end of 1999, there are total 420 listed firms in the SET, KTP (Krung Thai Bank Public Co., Ltd.) climbed into the top, with 10.84% of total market capitalization, 220,795.13 million baht market capitalization. The second large firm ADVANC (Advanced Info Service Public Co., Ltd.), with 5.97% of total market capitalization, 108,371.25 million baht market capitalization. The smallest firm is UV (Univentures Public Co., Ltd.), with 0.01% of total market capitalization, 175 million baht market capitalization.

1.2 Statement of the Problem

After established in 1975, Thai stock market has grown continually till 1997 in both stock price index and market capitalization, though there was a big fall at 1997 due to the economic recession, the Stock Exchange of Thailand is still considered as one potential emerging stock markets.

With the significant Thai economic recovery & growth, the importance of capital market kept on increasing as one source of fund for both local and
international investment. The more the growth of Thai stock market, the more significant the SET in Thai economy, the more important the SET in all fields of policy, business and academic, the more interesting of it’s trend & related causes studying.

This study is aimed to reveal the possible causes of the stock return movements on SET from the aspects of Holiday Effect and Firm Size Impact. The study will specially seek answers for the following questions:

1. Is that holiday affect stock returns?
2. If there is holiday effect, will is vary from company to company of different sizes?

If, stock return is affected by the holiday effect, and holiday effects are influenced by the firm size impact, the holiday effect is more obvious showed out from the small firms. Which means, the Thai stock market has significant returns on the pre-holiday, and, small firms have more distinct returns on the stock than those larger firms. These finding will beneficial for investors in their decision marking, and it is helpful for researchers in academic studying.
1.3 Research Objectives

The objectives of this study are:

To find whether Thai stock market is consistent with market efficient theory. To prove whether the holiday effect exist, if so, further more, to disclosure the relationship between Firm Size and the Holiday Effect, to identify the relationships between the Holiday Effect and the Stock returns.

➢ Is there a Holiday Effects on Stock Returns?
➢ Does Firm Size affect the Holiday Effect?

1.4 Scope of the Research

(1) Conceptual:

This study will mainly focus on the Firm Size Impact and the Holiday Effect, the Holiday Effect and the Stock Return in Thai stock market.

(2) Geographic:
The geographic area of this study will be limited on Thai Stock Market – Stock Exchange of Thailand only and the result will be applied in SET only.

(3) Time Frame:
This study will be based on the time series data of the SET Index from Jan 1993 to Dec 1999. The conclusion, hence, will be drawn from this time span only.

1.5 Limitation of the Research

(1) Holidays are mainly focused on Songkhan’s day and New Year’s day.
(2) This study will be done within Stock and Exchange of Thailand only.
(3) The limited time frame is drawn from Jan 1993 to Dec 1999.

1.6 Significance of the Study

There are many empirical studies of the stock market, some believe the market efficiency theory, suggested the price change to the arrival of new information, the current prices of stocks reflect all information about the stock
only. There are also empirical studies of Holiday Effect and the Stock Returns had been done continuously during the past couple of years. In general, those studies disclosed a certain stock return pattern, it also disclosed some particular relations of the particular holiday and the stock returns in a specific country, such as: the U.S. U.K. and Japan, etc.

There are some studies in Thailand had been conducted to study the stock price behavior of Stock Exchange of Thailand according the market efficiency theory. All the studies are with the same objective to study the level of efficiency of stock market or stocks price movement behavior. Panadda Dtantralertpab (1978) found the previous price changes are useless in predicting future price or return changes. The sequence of the stock prices is independent. Chamman Monglolkasem (1978) suggested for both daily and weekly, the sequence of the stock prices are independent. Jane Prasitlumkun (1983) in contrast, found for both daily and weekly, the sequence of the stock prices is dependent. Piyawadi (1991), in consistent with Jane Prasitlumkun, suggested for both daily and weekly, the sequence of the stock prices are dependent.

But there are no previous studies of the Thai stock market related to holiday effect & stock returns. Therefore, by investigating the stock return during past seven years, from year 1993 to 1999, this study aimed to identify whether the performances of SET follow the market efficiency theory. Or
whether there is holiday effect exists, this research analyzed the relationship between Holiday Effects and the Stock Returns in Thailand, the relationship between the Firm Size and Holiday Effects. The conclusion of this study may be used as significant references for investors and academic researchers.

For policy makers, since stock return is one important factor to lead the capital market growth. They can use result of this study as strategy to develop the performance.

For business investors, this study may greatly helpful in the stock trend forecasting and furthermore handful in their decision making, ultimately lead to maximize the shareholder’s profits.

For academic researchers, this study may be used as important evidence in the study of Thai stock market, to verify the performances of SET is supporting the market efficiency theory or the holiday effects exist in SET.
1.7 Glossary:

*AMEX*: The American Stock Exchange. One of the two major U.S. securities exchanges.

*Asked Price*: The price at which a dealer in securities will sell shares of stock out of inventory.

*Average Rate of Return*: The ratio of the average cash inflow to the average amount invested.

*Bid Price*: The price a dealer in securities will pay for a stock.

*Bid-Ask spread*: The difference between the price a securities dealer offers to pay for securities (the “bid” price) and the price at which the dealer offers to sell the securities (the “asked” price)

*Capital market*: A market for securities with maturities beyond one year.

*Closing price*: The price of a financial security in the last trade before the market closed.
**Coefficient of Variation (CV):** A standardized measure of the risk per unit of returns; calculated as the standard deviation divided by the expected return.

**Common stock:** Long term equity claim on the issuing corporation; does not guarantee dividend payments.

**Correlation:** Measure of the degree to which two variables move together.

**CRSP:** Center for Research in Security Prices

**Debenture:** A bond that is not secured by a mortgage on specific property.

**DJIA:** Dow Jones Industrial Average

**EPS:** Earning Per Share. A firm's annualized earning divided by the share price.

**Mutual Fund:** A financial intermediary that invests the pooled funds of savers, thus obtaining economies of scale in investing and reducing risk by diversification.
**NASDAQ:** The National Association of Securities Dealers Automated Quotations System.

**ND:** Nikkei-Dow

**NYSE:** New York Stock Exchange. One of the two major U.S. securities exchanges.

**Ordinary day:** Trading days after excluding the trading days before and after regular holidays and exchange holidays.

**Over-the-counter market:** A large collection of brokers and dealers, connected electronically by telephones and computers, that provides for trading in unlisted securities.

**P/E ratio:** The current stock price divided by the most recent annualized earning per share.

**Portfolio:** (1) The collection of securities that an investor owns

(2) The collection of real and financial assets that a firm owns

**Post-holiday:** Trading holidays after regular holidays.
**Preferred stock:** Long term equity securities, which pay a fixed dividend.

**Pre-holiday:** Trading days before regular holidays.

**SEC:** Securities and Exchange Commission. The U.S. government agency which regulates the issuance and trading of stocks and bonds.

**SET:** Securities & Exchange Commission. Federal government agency established in 1993 to regulate the public securities markets.

**SET Index:** SET Index shows the daily price movement of all securities traded on the Stock Exchange of Thailand (SET) on the current date compared with that of the base date, which is April 30, 1975 – the first day of the SET operations. The SET Index calculated as dividing the market capitalization of all listed common stocks on the present trading day by market capitalization of all listed common stocks on base day (April 30, 1975), then multiply by 100.

**Shareholders:** Those holding some shares of the firm’s equity. Also called “stockholders” and “equityholders”.

**S & P 500 Index:** A value-weighted price index made up at 500 large companies
traded on New York Stock Exchange.

*Standard deviation:* A statistical measure of the variability of a set of observations.

*Stock Dividend:* A dividend paid in the form of additional shares of stock rather than in cash.

*Stock market:* The financial market for trading shares of a firm.

*TSE:* Tokyo Stock Exchange

*Value weighted price index:* Market value of the firm's equity, relative to the aggregate equity market value of all firms traded on the exchange.

*Variances:* The square of the standard deviation.

*Warrant:* A long-term option to buy a stated number of shares of common stock at a specified price.
CHAPTER 2    LITERATURE REVIEW

There are six major fields that previous researches had been focused related to the stock return, which are: Holiday Effect, Day of the Week Effect, Time Zone Effect, Size Effect, Exchange Fluctuation Effect and the Efficient Market Hypothesis theory. For the first five sections, each field will be divided into four parts in studying that are: Definition, Measurement, Empirical Finding and Explanation. The last section will discuss the emergence of the efficient market hypothesis, Fama’s three version of the EMH, tests of the EMH and related studies in Thailand.

2.1 Holiday Effect:

2.1.1. Definition:

The influence of certain holidays imposed on the Stock Returns. Generally, there’s a high return in stock on the trading day before the major holiday, due to various causes, as for cash purpose, for tax-loss purpose etc. The Holiday Effects are different across the different countries through the different patterns, but some empirical studies suggest that, there are certain international linkages in between.
2.1.2 Measurement:

- To test whether the holiday effect exist, Kim and Park studied the daily value-weighted market returns for the period of 1963 – 1986 (1973–1986 for the NASDAQ returns), for all three major stock market in the U.S.: NYSE, AMEX and NASDAQ.

The daily market returns for the NYSE, AMEX, NASDAQ and S&P 500 are obtained from the CRSP Index Files (Center for Research in Security Prices<sup>1</sup>). The daily value-weighted market returns are calculated by:

\[
\frac{\text{Stock Index of Present day} - \text{Stock Index of Previous day}}{\text{Stock Index of Previous Day}}
\]

The trading days in the sample period are divided into three subsets:

- **Pre-Holiday**: trading days before regular holidays
- **Post-Holiday**: trading days after regular holidays
- **Ordinary Day**: trading days after excluding the trading days before and after regular holidays and exchange holidays
Sample mean, standard deviation, median, size of the sample (number of days) for NYSE, AMEX, NASDAQ market returns were investigated. To test the equality of daily mean returns between Pre-holidays and Ordinary holidays, the t-statistic is also conducted with 0.01 significant level.

By comparing the daily mean returns for the Pre-Holiday, Post-Holiday & Ordinary Day, results showed that significant mean returns on the Pre-Holidays are present in all three major U.S. stock market. The investigation of the median returns exhibits similar to the mean returns.

➢ At year 1990, Robert A. Ariel, conducted the study of High Stock Returns before Holidays in the U.S.

The holidays considered are those that can provoke stock market closings. These holidays are: New Year’s Day, Presidents’ Day (formerly Washington’s Birthday), Good Friday, Memorial Day, July Fourth, Labor Day, Thanksgiving, and Christmas.

All the data are drawn from the Center for Research in Security Prices’ (CRSP) value-weighted and equally weighted daily index for the
The samples are divided into two subsets: the trading days prior to the holidays in the sample period and all the rest.

The means and variances of the two stock indexes for these two sets of days were calculated and are reported along with a \( t \)-statistic for the difference of the mean.

The results showed that the mean of the Pre-Holiday returns exceed the means of the Non Pre-Holiday returns by nine to fourteen times for the equally- and value-weighted indices. The corresponding \( t \)-statistics for the differences of these means showed that the differences of the means are statistically significant.

2.1.3 Empirical Finding:

Many empirical studies of Holiday Effect and the Stock Returns had been conducted. As stock markets in the United States exhibit a strong holiday effect: There are abnormally high returns on the trading day before holidays in all three of the major stock markets in the U.S.: the NYSE, AMEX, and NASDAQ. (1994, Chan-Wung Kim and Jinwoo Park).
Abnormal pre holiday returns on U.S. stocks have been documented by finance practitioners for a long period of time. Merrill (1965) finds disproportionate advances of the Dow Jones Industrial Average (DJIA) on the trading day prior to the holidays for the period from 1897 to 1965.

Fosback (1976) reports high pre holiday returns in the S&P 500 index. Lately the holiday effect has been investigated furthermore in the academic literature (1988, Lakonishok and Smidt. 1989 Pettengill, 1990 Ariel). In his comprehensive analysis of the holiday effect, Ariel (1990) documents that for the CRSP value-weighted and equally-weighted index returns over the 1963-1982 period, the average pre holiday return is nine to 14 times higher than the mean return on the remaining days. He also reports that the high pre holiday returns are not a manifestation of other calendar anomalies such as the January Effect or the weekend effect.

2.1.4 Explanation:

What are the possible causes of the incremental returns before the holiday?

According to Roll (1983a), the abnormal returns associated with the January effect start on the last trading day of December. Distinctly, by excluding
the trading days before and after New Year's Day from the sample of regular holidays, as suggested in Pettengill (1989) and Ariel (1990), Kim and Park (1994) found the holiday effect is not the manifestation of the January Effect.

Robert A. Ariel (1990) also proposed the pre-holiday returns are not a manifestation of other calendar anomalies. It is neither a January Effect, nor a Weekend Effect, it is not a Small Firm Effect.

- Not a January Effect:

According to previous studies, the high January Effect seems responsible for the high returns on the Pre-Holiday before the New Year's day. As Ariel (1987) noticed the last day and the beginning of months are seasonally strong periods, especially for January that obviously the highest return month of the year (Rozeff and Kinney (1976); Reinganum (1983). Roll (1983a) observes that the period of January high returns in fact starts on the last trading day of December.

Robert A. Ariel (1990) proved the Pre-Holiday Effect is not the January Effect, by conducting dummy variable regression models of using both CRSP equally weighted (EW) and value-weighted (VW) daily index returns.
Table 2.1 Dummy Variable Regression Models:

<table>
<thead>
<tr>
<th>Rt</th>
<th>Constant</th>
<th>+ Monday</th>
<th>+ Wednesday</th>
<th>+ Thursday</th>
<th>+ Friday</th>
<th>+ Pre Holiday</th>
<th>+ PreNew Yr’s Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>EW</td>
<td>0.059</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+0.469</td>
<td>(t=7.44)</td>
</tr>
<tr>
<td></td>
<td>(t=5.26)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VW</td>
<td>0.025</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+0.340</td>
<td>(t=5.43)</td>
</tr>
<tr>
<td></td>
<td>(t=2.27)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Significance of High Pre-Holiday Returns:

EW=0.059 +0.469 (t=7.44)
(t=5.26)
VW=0.025 +0.340 (t=5.43)
(t=2.27)

Pre-Holiday Strength Not Caused by January Effect, High Pre-New Yr’s Returns:

EW=0.059 +0.401 (t=5.97) +0.545 (t=2.91)
(t=5.26)
VW=0.025 +0.329 (t=4.93) +0.082 (t=0.44)
(t=2.27)

Ariel first tested the regression of returns against a Pre-Holiday dummy only, the significance of the t-statistic attached to the pre-holiday dummy variable confirms the existence of the Pre-Holiday Effect.

Ariel again tested the regression of index returns against a pre-holiday dummy, and a separate pre-New Year’s holiday dummy. The continuing significance of the pre-holiday coefficient demonstrates pre-holiday strength is not caused by the January Effect.

Moreover, a non-parametric χ² test finds that the frequency of positive returns among all the pre-holidays, excluding pre-New Year’s for the equally- and value-weighted indices, are highly significant with
corresponding highly significant $\chi^2$ test statistics, which obviously showed that the January effect is not the driving force behind the observed pre-holiday strength through the January effect’s impact on the pre-New Year’s Day.

Not a Weekend Effect:

Is Weekend Effect responsible for the high pre-holiday returns? French (1980) and Gibbons and Hess (1981) report that the mean returns differ on different days of the week, with mean returns highest on Friday and Lowest on Monday, hence the high frequency of Friday and low frequency of Monday pre-holidays seems to be partially responsible for the results reported earlier.

Robert A. Ariel (1990) checked the possibility by regressing each of the two CRSP daily stock index returns against dummy variables for the days of the week plus an added pre-holiday dummy variable. For both CRSP indices, the magnitude of the pre-holiday dummy is large and statistically significant, the continuing significance of the pre-holiday coefficient demonstrates pre-holiday strength is not caused by the January effect, thereby showing that the high frequency of Friday and
low frequency of Monday pre-holiday is not responsible for the observed
pre-holiday strength.

Table 2.2: Dummy Variable Regression Models:

<table>
<thead>
<tr>
<th></th>
<th>Constant</th>
<th>+ Monday</th>
<th>+ Wednesday</th>
<th>+ Thursday</th>
<th>+ Friday</th>
<th>+ Pre Holiday</th>
<th>+ Pre New Yr’s Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Holiday Strength Not Caused By Weekend Effect:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EW = -0.003</td>
<td>-0.115</td>
<td>-0.132</td>
<td>+0.094</td>
<td>-0.205</td>
<td>+0.400</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(t=-0.11)</td>
<td>(t=-3.22)</td>
<td>(t=2.72)</td>
<td>(t=5.89)</td>
<td>(t=6.36)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VW = 0.026</td>
<td>-0.148</td>
<td>-0.073</td>
<td>-0.007</td>
<td>-0.064</td>
<td>+0.304</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(t=-4.28)</td>
<td>(t=0.20)</td>
<td>(t=0.20)</td>
<td>(t=1.86)</td>
<td>(t=4.85)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

> Not a Small Firm Effect:

Some previous studies found that the January and Weekend Effects generate significant premiums that accrue to small firms during the early days of January (Keim (1983); Roll (1983a) or on Fridays (Keim and Stambaugh (1984), respectively. While Robert A. Ariel tested that the high pre-holiday returns are not limited to small firms, by comparing the difference between pre-holiday mean returns of both equally- and value-weighted indexes, he suggested that small firms may earn a pre-
holiday premium.

However, after correcting both of January Effect high small firm returns by the addition of a pre-New Year dummy. And, for the Weekend
Effect high small firm Friday returns by addition of day-of-the-week dummy variables, the t-test of incremental small firm pre-holiday return showed out a insignificant, which indicated there’s no evidence of an incremental return accruing to small firms solely because of a “holiday effect”.

Table 2.3: Dummy Variable Regression Models:

<table>
<thead>
<tr>
<th>R_t = Constant</th>
<th>Monday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>+ Pre Holiday</th>
<th>+ PreNew Yr’s Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>SF=0.034</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+0.072</td>
<td>+0.525</td>
</tr>
<tr>
<td>(t=6.38)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(t=2.30)</td>
<td>(t=6.52)</td>
</tr>
<tr>
<td>SF=-0.030</td>
<td>0.033</td>
<td>0.060</td>
<td>0.089</td>
<td>0.142</td>
<td>+0.037</td>
<td>+0.501</td>
</tr>
<tr>
<td>(t=-2.63)</td>
<td>(t=2.05)</td>
<td>(t=3.73)</td>
<td>(t=5.48)</td>
<td>(t=8.69)</td>
<td>(t=1.18)</td>
<td>(t=6.28)</td>
</tr>
</tbody>
</table>

2.2 Day of the Week Effect

2.2.1 Definition:

Day of the Week Effect is a weekly pattern in stock market. There is a certain day during a week showed the highest mean return, and a certain day
showed the lowest mean return. The days are different according to different country.

2.2.2 Measurement:

➢ By investigating the regression model:

\[ R_t = \sum_{k=1}^{6} a_k D_{kt} + u_t \]

Kitoshi Kato (1990) tested the timing and existence of weekly patterns of the Japanese Stock Market, where \( D_{kt} \) are day-of-the-week dummy variables, such as \( D_{1t} = 1 \) if day \( t \) is a Monday, and \( D_{nt} = 0 \) otherwise; \( D_{2t} = 1 \) if it is a Tuesday, etc.

The coefficients of equation (1) are the mean returns for Monday through Saturday. The equality of these coefficients also tested by using an F-test.

The results displays a pattern of the daily returns similar to those observed by Jaffe and Westerfield (1985a, b), that, Tuesday returns are the lowest and Wednesday returns are the highest.

Kiyoshi Kato studied further about the pattern of intra-day returns by the same regression model, Summary statistics for the seven intra-day return
measures across days of the week during the period from 1982 through 1987 showed that weekly patterns exist for both non-trading and trading periods.

The results also showed F-values are significantly higher during the non-trading period mean returns during non-trading period are positive for all six days of the week. And, most of the positive returns arise during the non-trading period. During the trading period, both Monday and Tuesday experience negative returns. The average returns for other days of the week are close to zero excluding Saturday returns.

Jeffrey Jaffe and Randolph Westerfield (1985) tested the weekly seasonal in Japan by computing a return as the percentage change in the value of the index from the previous day.

The result suggest that, the average Monday return is negative, the average Friday, Saturday returns are high for both Nikkei-Dow (ND) Index and the Tokyo Stock Exchange (TSE) Index. The so-called weekend effect is statistically significant.

According to Keim and Stambaugh’s report, in periods with Saturday trading in the United States, Friday’s return is generally lower than Saturday’s return. To test the differences in mean return across the
six Japanese trading days and the five American days, the following regression model was conducted by Jeffrey Jaffe and Randolph:

\[ R_t = \alpha_1 d_{1t} + \alpha_2 d_{2t} + \ldots + \alpha_6 d_{6t} + u_t \quad t = 1, \ldots, T \]

Where \( R_t \) is the return at date \( t \) and \( d_{it} \) is a dummy variable equal to 1 if date \( t \) falls on the \( i \)th day of the week and equal to 0 otherwise. They test the hypothesis that \( \alpha_1 = \alpha_2 = \ldots = \alpha_6 \) for Japan’s stock indexes and \( \alpha_1 = \alpha_2 = \ldots = \alpha_5 \) for the S&P. The F-statistics are significant for all three Japanese stock markets: the S&P, ND and TSE. Respectively, Equality is easily rejected at the 1 percent significance level for each of these three indices.

The result suggested that though both Japanese stocks and American stocks exhibit day of the week effects, the patterns differ. The lowest mean return for the S&P Index occurs on Monday, while the lowest average returns for both Japanese indices occur on Tuesday.
2.2.3 Empirical Finding:

Some empirical studies using daily stock returns assume that the distribution of stock returns is stationary for all days of the week. This has been shown to be incorrect by numerous studies, which report a day of the week effect. Cross (1973) and French (1980) document that the average return for Monday is significantly negative and the other days of the week have positive returns of varying magnitude. The average return for Friday is higher than that of the other days of the week.

Several studies attempt to identify its cause. Gibbons and Hess (1981) propose and test the settlement hypothesis. Lakonishok and Levi (1982) add the check claring process to this settlement procedure. However, the results of neither study completely support the settlement hypothesis. Furthermore, Dyland Martin (1984) provide evidence against the settlement hypothesis. Keim and Stambaugh (1984) investigate a specialist related bias by examining the stocks in over-the-counter market. Their results are not consistent with a specialist-related bias. Measurement error is also examined by Gibbons and Hess (1981), Keim and Stambaugh (1984). Neither study supports the measurement error hypothesis.

These previous papers focus on daily returns measured from the previous day’s close to the current day’s close. Recent studies have employed intra-day
data by decomposing daily returns into shorter periods. Rogalski (1984) documents a non-trading weekend effect. All of the average negative returns from Friday close to Monday open. Smirlock and Starks (1986) extend Rogalski’s study by decomposing daily returns into six hourly return measures and extending the time periods. Their results indicate that day of the week effect is time variant. Harris (1986) documents that the Monday effect accrues for the first 45 minutes after the market opens.

Connolly (1989) analyzes the robustness of the day-of-the-week effects to alternative estimation and testing procedures. Connolly concludes that the strength of the day-of-the-week effects appears to depend on the estimation and testing method.

More studies have been conducted regarding this anomalous effect including Japan. Pettway and Tapley (1984) first document the weekly pattern in the Japanese stock market using three market indices and stock data from five major Japanese firms from 1979 through 1982. Their findings are different from those in the U.S. Tuesday returns are the lowest and Wednesday returns are the highest.

Jaffe and Westerfield (1985a, b) examine the daily stock indices for Australia, Canada, Great Britain and Japan. Their results for Japan are similar to Pettway and Tapley’s results for their longer sample period. In addition, the
structure of institutional correlation of weekly patterns is examined. The relationship between two major stock markets, the Tokyo Stock Exchange and the New York Stock Exchange, does not appear to be linked during the period 1970 through 1983. Measurement errors are also examined and the evidence does not appear to be influenced by measurement errors.

Ikeda (1988) replicates several U.S. studies using the index of Tokyo Stock Exchange. Similar results to Pettway and Tapley's are obtained regarding the day of the week effect. In addition, the weekly pattern also exists for skewness and kurtosis of the daily returns in Japan. Furthermore, high Wednesday returns are partly the result of the settlement effect according to Ikeda.

2.2.4 Explanation:

The possible causes of the Day of the Week Effect was suggested to be Saturday Effect & New York Effect (Kiyoshi Kato 1990), regardless Settlement Costs and Measurement Error (Jaffe & Westerfield 1985)

➢ Saturday Effect
To further investigate systematic weekday differences, Kiyoshi Kato examined how infrequent Saturday trading is related to the returns of the other days of the week. The weekly pattern seems to be related to Saturday trading, since the weekend effect of high Friday and low Monday returns found in the U.S. may also be observed in Japan when the week is closed by Friday trading.

This conjecture is tested by dividing the data into the following four groups: Group A contains the weeks closed by Saturday trading. Group B contains the weeks closed by Friday trading.

- A1: includes the weeks whose previous week is closed by Saturday trading.
- A2: contains the weeks whose previous week is closed by Friday trading.
- B1: previous week is closed by Saturday trading.
- B2: previous week is closed by Friday trading.

The following regression analysis is conducted for each group.

$$R_t = \sum_{k=1}^{6} a_k D_{kt} + u_t$$

The result showed that large negative returns are observed on Monday in the weeks whose previous week is closed by Friday (A2 and B2), the Tuesday effect almost disappears in the weeks closed by Friday trading. This finding
indicates that negative Monday and Tuesday returns in Japan are closely related to Saturday trading.

New York Effect

Do low Tuesday returns in Japan Stock market related to the Monday effect in the U.S. Since Tokyo is 14 hours ahead of New York? Is Japanese weekly pattern a analogous to the American Pattern led by one day?

To examine this hypothesis, correlation coefficients are computed between the Dow Jones Industrial Average of the New York Stock Exchange and the Nikkei Stock Average in the Tokyo Stock Exchange during the period 1980 through 1987.

The results showed high correlation between previous day returns (t=-1) of the New York Dow and the day close to open returns (t=0), which indicated that, the opening price of the Tokyo market is strongly related to the previous day’s New York market.

The lower correlation coefficients between previous day returns (t=-1) of the New York Dow and the day open-to-close returns (t=0) of Nikkei Stock
Average (see below) also indicated that, the stock price in Japan reflects information from the U.S. quickly.

Table 2.4:

<table>
<thead>
<tr>
<th></th>
<th>Tokyo (t=0)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Close to Open</td>
<td>Close to Close</td>
<td>Close to Close</td>
</tr>
<tr>
<td>New York</td>
<td>R 0.3306 p-value 0.0001</td>
<td>0.2817 (0.0001)</td>
<td>0.3721 (0.0001)</td>
</tr>
<tr>
<td>(t=-1)</td>
<td>Open to Close R 0.3823 p-value 0.0001</td>
<td>0.1091 (0.006)</td>
<td>0.2453 (0.0001)</td>
</tr>
<tr>
<td></td>
<td>Close to Close R 0.5363 p-value 0.0001</td>
<td>0.2551 (0.0001)</td>
<td>0.4313 (0.0001)</td>
</tr>
<tr>
<td>(t=0)</td>
<td>Close to Open R 0.1556 p-value 0.0001</td>
<td>0.0565 (0.0138)</td>
<td>0.1096 (0.0001)</td>
</tr>
<tr>
<td></td>
<td>Open to Close R -0.0057 p-value 0.8031</td>
<td>0.0591 (0.0099)</td>
<td>0.0484 (0.0348)</td>
</tr>
<tr>
<td></td>
<td>Close to Close R 0.0887 p-value 0.0001</td>
<td>0.0929 (0.0001)</td>
<td>0.1145 (0.0001)</td>
</tr>
</tbody>
</table>

Kiyoshi Kato conducted a more formally test of the New York Effect (1990) in the same manner as Jaffe and Westerfield (1985b). To investigate whether the weekly pattern in Japan differs from the U.S. pattern, infrequent Saturday trading should be considered. The sample data was divided into two groups, the first data set consists of the weeks whose previous week has Saturday trading. The second data set contains the remaining weeks. The following regression is conducted for both groups:
\[ R_{\text{JAP},t} - R_{\text{US},t-1} = \sum_{k=1}^{42} a_k D_{kt} + u_t \]

Where:

- \( R_{\text{JAP},t} \): is the close-to-close return of the Nikkei Stock Average on the Tokyo market
- \( R_{\text{US},t-1} \): is the previous day's close-to-close return of the New York Dow.
- \( D_{kt} \): is a dummy variable as defined in equation.

The insignificant F statistic of the first data set at 10 percent level and the significant F statistic of the second data set at 1 percent level indicated that, the low Monday return of the Nikkei Stock Average relative to high Friday return of the New York Dow. In another word, the Japanese Tuesday effect is really a reflection of the Monday effect in the U.S.

- **Settlement Costs**

Jaffrey Jaffe and Randolph Westerfield noticed that when settlement cost was included in the study without the concern of holidays, the average return for Japanese stocks on Thursday is low, thus, they suggested the Settlement Costs could not explain the Day of the Week Effect.
Settlement on the Tokyo Stock Exchange occurs on the third business day after the date of transaction, an arrangement different from the five-day procedure used in the United States. An individual earns the Thursday return when he buys at the Wednesday close and sells at the Thursday close. Here he pays cash on Saturday and receives cash on Monday, i.e., cash payment occurs two days before cash receipt. Conversely, cash payment occurs only one day before cash receipt for one-day holding periods beginning elsewhere during the week. To compensate for implicit interest, Japanese common stocks should have high-expected returns on Thursday. However, the average return on Thursday is low, a result inconsistent with the above.

If average "net" returns for each day of the week is calculated with the consideration of holidays. After subtracting the Settlement Cost, the "net" results for Thursday are lower than those results with Settlement Cost,. While the net results for other days excluding the Settlement Cost were quite close to those with Settlement Cost. Therefore, the Settlement procedures do not seem to explain the day of the week effect in Japanese stocks.
Measurement Error

Keim and Stambaugh (KS) have suggested that the high Friday returns and low Monday returns observed in the United States could be caused by upwardly biased quotes at Friday close. Similarly, biased quotes at Saturday close could cause high Saturday returns and low Monday returns in Japan.

Negative correlation between returns on Saturday and the following Monday would suggest a random type of measurement error. However, KS find a higher than average correlation between returns on these two days for U.S. data. Results by Jaffrey Jaffe and Randolph Westerfield (1985) for Japan also indicate higher than average correlation between these two days, which is consistent with KS, thus, no support was found for the random type of measurement error.

2.3 Time Zone Effect

2.3.1 Definition:

The international linkage of the stock markets exists among different countries. As, other countries showed the similar pattern in stock seasonality
with the U.S stock movement, as the response to the information disclosure of the U.S., but will be late for certain time period due to the particular time lag.

2.3.2 Measurement:

➢ To test whether the holiday effect in the U.S. stock market influences the stock markets of countries that have different holiday and institutional arrangements.

Chan-Wung Kim and Jinwoo Park investigated whether the holiday effects in the U.K. and Japanese markets are associated with the U.S. holiday effect at the year 1994. To test the Holiday Effects and International Stock Market Linkage, Kim and Park conducted the following regression:

\[ R_{ct} = \alpha_0 + \alpha_1 R_{US,t} + \alpha_2 D_{ct} + \alpha_3 D_{US,t} + \epsilon_{c,t}, \]

Where

- \( R_{ct} \): the index return on country c (the U.K. FT30 or the Japanese Nikkei) at date t.
- \( R_{US,t} \): the return on the U.S. S&P 500 on date t.
$D_{c,t}$: a dummy variable equal to one if date $t$ is pre-holiday in country $c$ and non pre-holiday in the U.S. and equal to zero otherwise.

$D_{US,t}$: a dummy variable equal to one if date $t$ is pre-holiday in the U.S. and non pre-holiday in country $c$ and equal to zero otherwise.

$\alpha_2$: coefficient which indicates the holiday effect in country $c$ after controlling the influence of the U.S. stock market.

$\alpha_3$: coefficient which indicates the marginal influence of the U.S. holiday effect at the non pre-holiday returns in country $c$ after controlling for U.S. linkage.

The U.K. FT30 and Japanese Nikkei-Dow index, and the U.S. S&P 500 returns are analyzed for the period from July 1, 1972, to June 30, 1987.

The descriptive statistics of Mean, Standard Deviation, Median Number of Days was conducted. T-Statistics (p-Value) was also used to test the equality between the mean return on the day examined and the ordinary day mean return. The non-parametric Z-statistic (Median Test) was also used to test the equality between the median return on the day examined and the ordinary day median return.

To be consistent with the descriptive statistics, the coefficient $\alpha_2$ is expected to be significantly positive, and the coefficient $\alpha_3$ is not significantly
different from zero. The results of regression analysis for the U.K. market show that the $\alpha_2$ is significant while $\alpha_3$ is insignificant, for the Japanese markets, similarly, the $\alpha_2$ is significant while $\alpha_3$ is insignificant. In summary, these results suggested that the holiday effects are present in the U.K. and Japanese markets independent of the U.S. market.

Kiyoshi Kato also tested whether low Tuesday returns in Japanese stock market related to the Monday effect in the U.S. (1990). Since Tokyo is 14 hours ahead of New York, the Japanese weekly pattern might be analogous to the American pattern led by one day.

To investigate whether the weekly pattern in Japan differs from the U.S. pattern, infrequent Saturday trading should be considered. The sample are from the Value Weighted Index (TOPIX) of the Tokyo Stock Exchange, data consist of the daily return observations of the TOPIX from April 1978 through June 1987. During the sample period 1978 to July 1983, the Tokyo Stock Exchange was closed on the third Saturday of each month. During the period August 1983 to July 1986, the market was closed on the second Saturday of each month. From July 1986 to 1987, the market has been closed on the second and third Saturday of each month.
Kiyoshi divided the data into two groups, the first data set consists of the weeks whose previous week has Saturday trading. The second data set contains the remaining weeks. The following regression is conducted for both groups:

\[ R_{\text{JAP},t} - R_{\text{US},t-1} = \sum_{k=1}^{6} a_k D_{kt} + u_t, \]

Where:
- \( R_{\text{JAP},t} \) is the close-to-close return of the Nikkei Stock Average on the Tokyo market.
- \( R_{\text{US},t-1} \) is the previous day’s close-to-close return of the New York Dow.
- \( D_{kt} \) is a dummy variable.

The result showed that the F statistic of the first data set is not significant at the 10 percent level. The F statistic of the second data set is significant at the 1 percent level. The significant F statistic for the second data set is mainly caused by the low Monday return of the Nikkei Stock Average relative to high Friday return of the New York Dow.

In the first data set, the Monday return of the Nikkei Stock Average is excluded because there’s no matched day. Thus, when excluding the Monday returns from the Japanese stock returns, the weekly pattern of two markets is acceptable to be the same. The finding supported that the Japanese
Tuesday effect is really a reflection of the Monday effect in the U.S. In addition, the Monday effect exists in the Japanese daily stock returns.

2.3.3 Empirical finding

There are many empirical studies (e.g. Eun and Shim (1989), Hamao, Masulis, and Ng (1990), and Becker, Finnerty, and Gupta (1990) that provide evidence of international linkages of daily stock market returns. Also, the international evidence of the day-of-the-week effect indicates an association between the stock return patterns of the U.S. and other markets (Jaffe and Westerfield (1985a), (1985b). Related to the international linkages of stock markets, prior empirical evidence on the international stock market with a one-day lag due to the time-zone difference (Eun and Shim 1989, Becker, Finnerty, and Gupta 1990)

Chan-Wung Kim and Jinwoo Park (1994) suggested that the holiday effect exist in the U.K. and Japanese markets independent of the U.S. market. Kiyoshi Kato (1990) tested that the Japanese Tuesday effect is really a reflection of the Monday effect in the U.S. In addition, the Monday effect exists in the Japanese daily stock returns.
2.4 Firm Size Effect

2.4.1 Definition:

The different Firm Sizes are responsible differently for Holiday Effects and Stock Returns. Generally, the Holiday Effect is greater for small-firm stocks than for large-firm stocks. Furthermore, the reverse Size Effect is also observed for Stock Returns, as the size of firms' decreases, the Stock Returns tend to be higher.

2.4.2 Measurement:

To investigate whether the holiday effect persists across size decile portfolios, Kim and Park conducted the dummy variable regression analysis for testing incremental pre-holiday effect across size decile portfolios after controlling for the Day-of-the-Week effect and the Pre-new-Year’s-Day Effect.

The size decile portfolios that used by Kim and Park (1994) are composed of stocks traded on the NYSE and the AMEX that are ranked into 10 portfolios based on the market value as of December 15th of the previous
years. The sample contains the daily mean return around holidays for each decile portfolio over the 1963-1986 periods.

The dummy variable regression model is as following:

\[ R_{P,t} = \alpha_{P,1} + \alpha_{P,2} \text{Mon} + \alpha_{P,3} \text{Wed} + \alpha_{P,4} \text{Thu} + \alpha_{P,5} \text{Fri} + \alpha_{P,6} \text{PreHol} + \alpha_{\text{PreJan}} + \epsilon_{P,t} \]

(P = 1, ... 10)

Where:

P: the estimate of coefficient

\( \alpha_{P,6} \): the incremental mean returns earned on pre-holidays after controlling for the day-of-the-week effect and the pre-New-Year's-Day effect.

The magnitudes of \( \alpha_{P,6} \) range from 0.23 percent to 0.323 percent across size decile portfolios, all of them are statistically significant at the 0.01 level. The results consistent with those of Ariel (1990), which indicate that, size effect is present in mean returns on pre-holidays without controlling for the day-of-the-week effect and the pre-New-Year's-Day effect. The results suggest that the systematic trading patterns around holidays are not able to explain the holiday effects.
By comparing the daily mean returns across size-decile portfolios, the result shows that the mean returns on small firm portfolios are high on post-holidays. Keim (1983) reports high returns in small firm stocks during the first trading day of the year, which is the day after New Year’s Day. After excluding New Year’s Day from the sample of holidays, Kim and Park (1994) found the mean returns on post-holidays are the same across size decile portfolios.

Kiyoshi Kato also studied the Size Effect by conducting the following regression analysis:

$$R_t = \sum a_n D_n + u_t$$

By comparing the mean portfolio Close-to-Close, Close-to-Open and Open-to Close returns by week and Firm Size during the period January 1974 through June 1987, where the firm size are arranged into five size related portfolios: smallest, 2nd, 3rd, 4th and the largest.

The results showed all $F$ statistics are significant, a size effect is observed for both close-to-close returns. The $F$(size) statistic indicate that both the size and reversal size effects are significant, but the size effect is much larger.
2.4.3 Empirical finding:

Prior research on seasonality has found a relationship between the seasonal pattern of stock returns and firm size. Keim (1983) shows that the January effect is mainly a small-firm effect. Also, Keim and Stambaugh (1984) find that the weekend effect is greater for small-firm stocks than for large-firm stocks.

Keim and Stambaugh (1984) and Keim (1987) investigate the relationship between the January-size effect and the day of the week effect. Friday returns are strongly related to firm size and Monday returns are consistently negative across all size portfolios.

Recent studies also examine the relationship between holiday effect and firm size. Petttingill (1989) reports that small firms outperform large ones both on January and non-January pre-holidays. Ariel (1990), on the contrary, finds that there are no incremental pre-holiday returns accruing to small firms after adjusting day-of-the-week effect and excluding New Year's Day.

Kim and Park (1994) observe that the holiday effect is more pronounced for stocks of large firms than small firms. The daily mean returns on pre-holidays are found to be much higher than those on ordinary days for all size
decile portfolios, but not by the same proportion. Roll (1983a) finds that the period of January high returns starts on the last trading day of December, and Keim (1983) reports that the turn-of-the-year effect centers on small firm stocks.

Kim and Park also reported the size decile portfolio returns on pre-holidays after excluding New Year’s Day. They observed that the exclusion of New Year’s Day reduces the mean returns on small firm portfolios. However, as suggested by Ariel (1990), these results are potentially infected by the day-of-the-week effect. Pre-holidays disproportionately fall on Fridays. Keim and Stambaugh (1984) report that high mean return on Friday center on small firm stocks. After controlling for the day-of-the-week effect and the pre-New-Year’s-Day Effect, size effect is not present in mean returns on pre-holidays are not able to explain the holiday effects.

In contrast, Kiyoshi Kato (1990) observed a reverse size effect at his study of Weekly Patterns in Japanese Stock Returns. By conducting the regression analysis, Kiyoshi Kato found all F statistics are significant. A size effect is observed for both close-to-close and close-to-open returns. However, a reversal size effect is observed for open-to-close returns. As the size decreases, the weekly pattern tends to be larger.

These results are consistent with the U.S. findings. The size effect is observed for close-to-open returns of both January and non-January months.
The reversal size effect during the trading period does not occur in January. One noticeable observation is that negative Tuesday returns mainly occur in non-January months.

2.4.4 Explanation:

Based on the association of the holiday effects with firm size, some possible explanations for these seasonal patterns have been proposed in the finance literature. In relation to the holiday effect, Keim (1989) suggests that systematic patterns in investor buying and selling behavior explain the unusually high returns observed on the trading days prior to holidays. If closing prices two days before the holiday tend to be recorded at the bid while closing prices on the trading day before the holiday are recorded at the ask, then these systematic patterns would produce high returns observed on the trading day prior to the holiday. If this is true, then the trading pattern would be more significant for small-firm stocks since the relative bid-ask spread is larger for these stocks.

2.5 Exchange Fluctuation Effect

2.5.1 Definition:
The influences imposed by the foreign Exchange Fluctuation on the Stock Returns. Generally concerns with the cross regional transactions. From the point of view of one foreign investor, the seasonal in local currency does not always offset the seasonal in it’s common stocks.

2.5.2 Measurement:

Jerrey Jaffe and Randolph Westerfield studied the Japanese Stock Returns to American Investors ((1985). By investigating the Percent Daily Returns during a week for U.S. Investors in Japan Nikkei-Dow from January 1975 to September 1981, the Mean, Std.Dev. Standard Error, Skewness, Kurtosis, and observations were analyzed. Where the return for a given week for Transaction is defined as:

\[
(1 + R_{JM})(1 + R_{YT}) - 1
\]

\(R_{JM}\): is Monday’s return on Japanese stocks

\(R_{YT}\): is Tuesday’s return on yen
The returns for American investing in Japanese stocks presents a seasonality, which closed related to the seasonals for Japanese investors participating in their own stock market.

In addition, the approach of following regression was also used for testing the returns:

$$R_t = \alpha_1 d_1 + \alpha_2 d_2 + \ldots + \alpha_6 d_6 + u_t \quad t = 1, \ldots, T$$

The F-value for the ND and TSE are both significant at the 1 percent level for degrees of freedom. Thus, the seasonal in foreign exchange does not seen to offset the seasonal in the foreign exchange markets.

2.5.3 Empirical finding:

In concern about the stock returns related to Exchange Fluctuation Effect, primarily with integrating foreign exchange fluctuations with Japanese stock returns, McFarland, Pettit, and Sung (MPS) find that returns on the yen to a U.S. investor are generally high on Mondays and Tuesdays and low on Thursdays and Fridays.
Jaffrey Jaffe and Randolph Westerfield (1985) suggested from an American investor's point of view, the seasonal in yen does not offset the seasonal in Japanese common stocks.

2.5.4 Explanation:

In case of foreign exchange fluctuations with Japanese stock returns, since the settlement period for stocks differs from the settlement period for foreign exchange, a transaction date in the Japanese stock market must be matched with another, usually different with the date in the market for yen. The settlement period in stock is three days, the settlement occurs two business days following a foreign currency transaction. The returns for Americans investing in Japanese stocks showed a seasonality which closely related to the seasonals for Japanese investors participating in their own stock market. The seasonal in foreign exchange does not offset the seasonal in the foreign exchange stock market.
2.6 The Efficient Market Hypothesis (EMH)

The most of the existing financial studies are based on the market efficiency theory, which in contradictory with the holiday effect suggestions. Advised that the stock prices adjusted to the infusion of new information, and, the stock price change to the arrival of new information, the current prices of stocks reflect all information about the stock only, which, doesn’t agree with any trend analysis such as holiday effect etc.
2.6.1 The Emergence of the Efficient Market Hypothesis

Samuelson's (1965) paper was of importance for the emergence of the modern literature concerning the EMH. Samuelson's analysis with its characterization of equilibrium using a martingale model constituted an economic model of asset price determination that could be linked with traditional assumptions about preferences and returns. (A price follows a martingale process if on average it remains stable— that is, it varies randomly about a constant mean.) LeRoy suggests that it is best to view the martingale model as an extreme version of the fundamental model modified by assuming that a large majority of traders are conducting fundamental analyses, are arriving at the same estimates of fundamental values, and are trading appropriately; thus price will be bid to equality with fundamental value and opportunities for trading profits will disappear. Instead of assuming that price fluctuates around fundamental value, Samuelson assumed that price actually equals fundamental value. This viewpoint is in marked contrast to Keynes's perception of the difficulty/impossibility of assessing the real value of many assets and the importance of extrinsic influences on asset prices.

Fama's (1970) survey marks the start of the modern literature on efficient capital markets. Fama's paper, like the material it surveyed, was largely concerned with empirical work. However, Fama also provided some
preliminary theoretical discussion and these theoretical remarks (together with his 1970 contribution) were influential in the sense of determining the nature of the work which followed. Fama utilized the martingale model and it should be stressed that by doing so he identified market efficiency with the validity of a particular model of equilibrium in financial markets. Market efficiency thus becomes a complex joint hypothesis.

2.6.2 Fama’s Three Versions of the EMH

In Fama’s discussion, a capital market is efficient if all the available information is fully reflected in security prices. Fama then distinguished three versions of the efficient markets model depending on the specification of the information set.

At one end of the spectrum is strong - form efficiency asserts that the information set used by the market to set prices contains all of the available information that could possibly be relevant to pricing the asset. Not only is all publicly available information embodies in the price but all privately held information is as well.

A substantial notch down from strong – form efficiency is semi – strong – form efficiency. A market is efficiency is semi – strong form efficient in the semi
– strong sense if it uses all of the publicly available information. The important distinction is that the information set is not assumed to include privately held information.

At the bottom of the ladder in the efficiency hierarchy is weak – form efficiency, which requires only that, the current and past price history be incorporated in the information set.

2.6.3 Test of the EMH

Econometricians testing the application of the theory to share price face a dilemma – ideally, they would test whether prices do reflect fundamental value, but they have no measure of these values because the future returns on the assets are uncertain. They cannot provide direct tests of theory and have to use a proxy for fundamental value or test whether characteristic of stock market prices or the performance of portfolios is consistent with the theory.

The weak - form of the EMH have been exhaustively tested and some qualification to its application has been established. The test, most of which have been based on US data, test the form of specifying rule which conflicts with the EMH and testing for the application of the rule. For examples, tests have been carried out to see if the sequence of daily gains and losses is random by
attempting to use the actual sequence of gains and losses to predict future gains or losses. If prices of shares rise for, say, to consecutive days are they more likely to rise than fall on the third day? Until recently such simple tests have usually failed to contravene the EMH, but some flaws have been established; for example:

1. There is some evidence that the shares of small firms have outperformed the market over long, but not all, periods

2. Companies with low P/E ratios have scored above average returns (a P/E ratio is the ratio of the prices of a company’s shares to the company’s earnings per share for the latest year for which this information is available)

3. Movements in the US stock market are disproportionately concentrated in January

4. The existence of and/or predictable changes in the discount of the prices of shares in investment trusts to the stock market valuation of the portfolios of shares held by the investment trusts conflicts with the EMH.
The 1987 Crash, when the Dow Jones index fell by 30.7% in six days, gave a new impetus and direction to tests of the EMH and added credibility to tests, which contradicted the hypothesis. Because such a large and swift fall was not compatible with changes in stock market prices being determined by new information concerning fundamentals alone. Prior to 1987, Shiller (1981) had apparently punctured the EMH by demonstrating that, historically, share prices had fluctuated much more than the discounted flow of dividends; a fluctuation is share prices had occurred which could not be explained by fundamentals. Recently more penetrating statistical tests have been used to test the EMH and have shown that stock returns exhibit positive serial correlation over short periods and negative correlation over long intervals. (Poterba and Summers, 1987) the novelty of the new tests is that they are used to test for positive and negative correlation over protracted periods. On the day-to-day basis price changes may appear to be random or nearly so, but over a period of say 50 years there may be a persistent element in price changes. To test for such patterns, data for long periods of time are required and/or data for a number of stock markets.

Tests have been made of the semi-strong form of the EMH by examining how quickly new information is reflected in prices – market efficiency required that it is reflected rapidly and that investors cannot achieve above-average returns by studying, say, the annual results of companies a week after they are published. Again, only limited deviations from the EMH have been established.
and Fama (1991) attaches considerable significance to these results. He suggests that they give the most direct evidence on market efficiency. In fact, there is an important qualification to this conclusion. All that the results show is that the market does not rapidly change its view of the significance of news, which is very different from saying that it assesses the long-term implications of news accurately.

The strong – form of the EMH is not susceptible to testing because there is no way of knowing the information available to all the participants in the market including. For example, the directors of companies and others who have inside information and the use they make of this information as investors.

The EMH supposition that the market fully and correctly reflects all relevant information in determining security prices is at odds with the fact that different investors simultaneously hold different expectations for future movements of share prices (McInish and Srivastava, 1984). The heavy turnover of shares which involves willing buyers and sellers is also witness to different assessments of value, though some exponents of the EMH would argue that the turnover of shares by institution is excessive.

Although breaches have been opened in the EMH, it is not clear that the flaws identified enable investors to adopt a rule, which make it possible for them to outperform the market, because they would incur transaction costs, which
would offset part or all of the gains. Also, if a profitable rule were discovered, publication of the rule would be likely to lead markets and market participants to move to eliminate the opportunity. (There could be an initial phase when as a result of many investors applying the rule there were exaggerated movements of share prices.)

A notable feature of many of the statistical tests of the EMH is that the rules tested are very simple, much simpler than the procedures that are used by institutional investors to allocate funds between classes of investments and to select shares. Also random lapses from efficient of information, even if they are wider spread and pervasive, may not be exposed by tests for market failure, which aim to expose systematic failure.

2.6.4 In case of Thailand (Piyawadi, 1991)

There are 4 interesting researches, which studied about, stocks prices behavior of Stock Exchange of Thailand. They are research of Panadda Dtanralertpab (1978), Chamnan Mongkolkasem (1978). All of these researches have the same objectives as to study the level of efficiency of stocks market or stocks price behavior by testing whether the movement of stock price follows the random walk theory. All studies with respect to data testing, methodology and result in table 2.6.
Anyhow, the objective of this study is to find whether there is holiday effect exists in Thai stock market and if it is, is that there any systematic pattern could be defined. Or there is no holiday effect; the price movement in SET is actually following the market efficiency theory.
Table 2.6 Studies of Market Efficiency in Thailand

<table>
<thead>
<tr>
<th>The research of</th>
<th>Data Testing</th>
<th>Methodology</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panadda Dtantraeripab (1976)</td>
<td>Weekly closed price of 18 stocks from 30, 1975 to July 2, 1977</td>
<td>Serial Correlation Coefficient, Run tests</td>
<td>The previous prices changes are useless in predicting future price or return changes. The sequence of the stock prices are independent.</td>
</tr>
<tr>
<td>Jane Prasilumkun (1983)</td>
<td>Daily and Weekly closed price of 20 high volume stocks during 1987 to 1991</td>
<td>Serial Correlation Coefficient, Run tests</td>
<td>Both daily and weekly, the sequence of the stock prices are dependent.</td>
</tr>
<tr>
<td>Piyawadi (1991)</td>
<td>SET index and sectorial price indices of 5 high activity sectors during 1987 - 1990</td>
<td>Regression analysis, Serial Correlation Coefficient, Run tests</td>
<td>Both daily and weekly, the sequence of the stock prices are dependent.</td>
</tr>
</tbody>
</table>

CHAPTER 3  RESEARCH FRAMEWORK

This chapter includes four parts. The first part presents the Diagram of Framework and the Conceptual Framework, based on concepts and theories in the previous chapter. The second part presents the Definition of the Variables. The third part presents the Hypothesis, and the forth part presents the Expected Outcomes.

3.1 Diagram of Framework & Conceptual Framework:

3.1.1 Diagram of Framework:

3.1.2 Conceptual Framework:

The conceptual framework is based on the integration of concepts and theories from the below:
According to Chan-Wung Kim and Jinwoo Park's study (1994) <Holiday Effects and Stock Returns: Further Evidence> there is abnormally high returns on the trading day before holidays in all three of the major stock markets in the U.S.. The Holiday effect is also present in the U.K. and Japanese stock markets, but independently of the holiday effect pattern in the U.S. stock market.

The study <Weekly Patterns in Japanese Stock Returns> conducted by Kiyoshi Kato (1990) suggested the weekly pattern is more distinct for the returns of smaller firms. A reverse size effect is observed during the trading period.

3.1.3 Assumptions:
In this study, we assumed that the major influence of stock return comes from the holiday effect, while the firm size also impose a main impact in the stock return.

3.2 Definition of the Variables in this study:

The dependent variable in this research is stock return, the independent variable is firm size, the holiday effect is independent related with firm size impact and dependent in consideration with stock returns.

3.2.1 Holiday Effect

The influence of local holiday imposed on Thai Stock Returns. Among many various holidays, The Songkran Day and the New Year’s Day will be selected as the major base of “Holiday Effects” of this research, because both Songkran and New Year’s Day provoke the longest closing and therefore, have more important impact on the stock returns.

During the sample period, one trading day prior the Holiday is defined as pre-holiday, while all the rest-trading days except the pre-holiday and all regular holidays and exchange holidays are defined as ordinary days.
3.2.2 Stock Returns

The Stock Returns in this research means Value-Weighted Market Returns on the SET. Calculated as:

\[
\frac{(\text{Stock Index of Present day} - \text{Stock Index of Previous day})}{\text{Stock Index of Previous day}}
\]

3.2.3 Firm Size Impact:

In this research, firm size impact means the response of different sized firms to the holiday effect. Firms are all securities listed on the SET that had returns on the SET during the sample period. All firms were selected on the base of market capitalization, then, the yearly distributions of market capitalization were equally divided into 10 portfolios on the base of size. Portfolio 1 containing the largest firms, portfolio 10 containing the smallest firms.
3.3 **Hypothesis:**

From the conceptual framework and research questions of this study, the research Hypothesis are as following:

Ho: there's no relationship between holiday effect and stock returns  
Ha: there's relationship between holiday effect and stock returns

Ho: there's no relationship between firm size and holiday effect  
Ha: there's relationship between firm size and holiday effect

3.3 **Expected Outcomes:**

According to the previous literature studies in other stock market, the Thai stock market is supposed to have a pattern with the holiday effect. Means, the stock returns on the last trading day prior to the Sonkran’s Day and the last trading day prior the New Year’s Day, supposed to be higher than the ordinary days. Furthermore, the holiday effect is impacted by firm size; small firms seem to have higher stock return in pre-holiday than those larger firms.
CHAPTER 4 RESEARCH METODOLOGY

This chapter presents the methodology used to conduct in this study, which is divided into Data Sources, Data Collection, Data Measurement and Data Analysis.

This study is based on secondary data from SET Index.

4.1 Data Source and Data Collection:

Secondary data was collected from several sources that include SET, Internet and many libraries.

4.1.1 The following table represents sources of information:

<table>
<thead>
<tr>
<th>Data</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stock Returns</td>
<td>SET and Internet</td>
</tr>
<tr>
<td></td>
<td>I-SIMs CD and CD of listed Company Info 2000</td>
</tr>
<tr>
<td>Firm Size</td>
<td>SET</td>
</tr>
</tbody>
</table>
4.1.2 Data Grouping:

From the record of past trading that filed in I-sims CD, the daily stock rank for all listed companies was sorted by the market capitalization, for example, Jan 4, 1993. Then, all the daily % change in index was calculated according the particular metrology.

All listed firms in each day’s stock rank were grouped into ten portfolios according to their size – market capitalization. Due to the listed companies are various for each day, the total number of firms will be various accordingly, the total number of firms will be divided into ten, all the odds and ends will be included in the portfolio 10 – the smallest portfolio.

For instance, there are total 305 firms in the stock market on Jan 4, 1993. The first 9 portfolios were 30 firms for each, and the last – also the smallest included the rest 305 firms.
4.2 **Data Measurement**

Table 4.2 Operationalization of the Independent and dependent variables:

<table>
<thead>
<tr>
<th>Variables to be tested</th>
<th>Operationalized by</th>
<th>Literature support</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent Variables:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Market Return</strong></td>
<td>Value-Weighted Market Return</td>
<td>Literature Support: SET Literature</td>
<td>Ratio Scale</td>
</tr>
<tr>
<td><strong>Independent variables:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Holiday Effect</strong></td>
<td>Days</td>
<td>Literature Support: Holiday Effects and Stock Returns (Kim and Park 1994)</td>
<td>Nominal Scale</td>
</tr>
<tr>
<td><strong>Firm Size Impact</strong></td>
<td>Size Decile Portfolio</td>
<td>Literature Support: The study of Weekly Patterns in Japanese Stock Returns (Kiyoshi Kato 1990)</td>
<td>Ratio Scale</td>
</tr>
</tbody>
</table>
4.3 Data Analysis

4.3.1 Hypothesis:

Table 4.3 Hypothesis

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ho: there's no relationship between holiday effect and stock return</td>
<td>t-statistic</td>
</tr>
<tr>
<td>Ho: there's no relationship between firm size impact and holiday effect</td>
<td>F-statistic</td>
</tr>
</tbody>
</table>

4.3.2 Explanation:

The initial test of the holiday effect is conducted with SET daily value-weighted mean returns. The trading days in the sample period are divided into two subsets:

*Pre-Holiday:* Last trading days before holiday.

*Ordinary Day:* Trading days after excluding the Pre-Holiday.

The test of the firm size impact is conducted with all firms listed on the SET that had returns on the SET during the sample period. The numbers of the
firms are ranged from 305 in 1993 to 420 in 1999. All sample firms were selected and ranked on the base of their market capitalization. Then, the yearly distributions of market capitalization were equally divided into 10 portfolios on the basis of size. Portfolio 1 contains the largest firms and portfolio 10 containing the smallest firms.

The statistic methodologies that used in this research are:

(1) The independent sample t - statistic was used in analysis of holiday effect and stock returns

The independent sample t - statistic was conducted for testing the stock Return behavior around holidays, to test the equality between the value weighted mean return on pre-holiday and the mean return on ordinary days.

Levene’s test for equality will be used first to test if the spread of the mean return on pre-Holiday and the mean return on ordinary days differs. The null hypothesis is that the two population variances are equal. If the observed significance level is very closed to 0, that indicated the imperfection of the used test statistic.
The t-statistic are subject to 95% confidence level, the relationship will be tested in a single econometric model, which includes the following null and alternative hypothesis:

H₀: There is no significant different in means between holiday effect and stock return

H₁: There is significant in means between holiday effect and stock return

Which, in statistic notation:

H₀: \( r_{\text{holiday}} \neq r_{\text{ordinary day}} \)

H₁: \( r_{\text{holiday}} = r_{\text{ordinary day}} \)

The null hypothesis states the Stock Returns cannot be explained by the independent variables. To reject null hypothesis means the independent variables are responsible for the stock return.

(2) F-statistic (One Way ANOVA) was used in analysis of firm size impact and holiday effect
The F-statistic (one way ANOVA) was conducted for testing the stock return behavior around holidays across size decile portfolios for ordinary days and the pre-holiday by studying equality of mean returns on pre – Songkhan’s Day and pre – New Year’s day.

Analysis of variances is used to test if any differences exist among the mean returns among the ten size decile portfolio. An assumption for analysis of variance is that the groups’ variances are equal, therefore, the levene homogeneity of variance test is used for testing the assumption.

If the observed significance level of Levene’s test is very closed to 0, which indicated the imperfection of the test statistic that used, the nonparametric test will be further conducted to ensure the reliability of the test.

95% confidence level is used. The hypothesis is as below:

Ho: There is no significant difference among the mean returns of size decile portfolio

Ha: There is significant difference among the mean returns of size decile portfolio
which, in statistic notation:

\[ \begin{align*}
\text{Ho: } & r_1 \neq r_2 \neq \ldots \neq r_{10} \\
\text{Ha: } & r_1 = r_2 = \ldots = r_{10}
\end{align*} \]
CHAPTER 5 RESULT OF THE STUDY

This chapter represents the empirical results of the model proposed in the chapter 3. The research findings and the analysis of the study are also included in this chapter. This chapter is divided into two sections. The first section t-statistic, and the second section is F-statistic.

5.1 t-STATISTIC

The independent sample t-statistic is used to analyze the relationship between holiday effect and stock turns at 95% significant level.

Table 5.1 and table 5.2 showed the group statistic for the t-statistic of ordinary day (coded as 1) and pre - Songkhan’s day (coded as 2), the t-statistic of ordinary day and pre - New Year’s day (coded as 3).
Table 5.1: Group statistics of ordinary day (1) and pre–Songkhan’s day (2)

<table>
<thead>
<tr>
<th>Group Statistics</th>
<th>DAYS</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>RETURN</td>
<td>1</td>
<td>1705</td>
<td>-3.73E-03</td>
<td>4.294</td>
<td>0.104</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>7</td>
<td>0.112</td>
<td>0.705</td>
<td>0.288</td>
</tr>
</tbody>
</table>

Table 5.2: Group statistics of ordinary day (1) and pre–NewYear’s day (2)

<table>
<thead>
<tr>
<th>Group Statistics</th>
<th>DAYS</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
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<td>4.294</td>
<td>0.104</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>7</td>
<td>0.914</td>
<td>1.186</td>
<td>0.448</td>
</tr>
</tbody>
</table>

There are total 1705 ordinary days across 7 year sample period, total 7 days pre–Songkhan’s day and total 7 days pre–NewYear’s day.

The mean return on pre–Songkhan’s day = 0.112 and mean return on pre–New Year’s day = 0.914, both are greater than mean return on ordinary day = -3.73E-03. Thus, by the group statistic, seems there is the holiday effect exists in Thai stock market.

The outcomes of further study are showed in table 5.3 and table 5.4. Where, the levene’s test of pre–Songkhan’s day = 0.563 and Levene’s test of pre
New Year's day = 0.708, both are significant, proved the reliability of test statistic that been used.

The t-statistic of pre – Songkhan’s day = 0.947 > 0.05 significant level, indicated Ho is not rejected. Means, the Ha is rejected, there is NO relationship between holiday effect and stock returns. There is NO pre – Songkhan’s effect exists in Thai stock market.

In addition, the t-statistic of pre – New Year’s day = 0.572 > 0.05 significant level, indicated Ho is not rejected, Ha is rejected, Means, there is NO relationship between holiday effect and stock returns. There is NO pre – New Year effect present in Thai stock market too.

The results are contrast with the finding of Jim and Park’s studying in all three US stock market (1994), which presented the abnormal stock returns on pre-holiday. The results are consisting with the market efficiency theory that introduced by Samuelson (1965) and Fama (1970) that suggested the stock price are adjusted to the infusion of new information; the movement had no trend according to the holiday effect.
Table 5.3 Independent Sample t-Test for Ordinary day and Pre-Songkhan’s day

<table>
<thead>
<tr>
<th></th>
<th>Levene's Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
<td>t</td>
</tr>
<tr>
<td>RETURN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>.334</td>
<td>.563</td>
<td>-.066</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>-.381</td>
<td>.676</td>
<td>6.390</td>
</tr>
</tbody>
</table>

Table 5.4 Independent Sample t-Test for Ordinary day and Pre-New Year’s day

<table>
<thead>
<tr>
<th></th>
<th>Levene's Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
<td>t</td>
</tr>
<tr>
<td>RETURN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>.140</td>
<td>.708</td>
<td>-.565</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>-1.995</td>
<td>.088</td>
<td>6.663</td>
</tr>
</tbody>
</table>
Furthermore study of holiday effect and stock returns across size decile portfolios are conducted again by using t-statistic. The outputs are showed from table 5.6 to table 5.25 (page 56).

Table 5.6 & 5.7 studied the portfolio 1 – the largest portfolio, Levene’s test of 0.177 and 0.151 showed the reliability of the test statistics. And t test of 0.976 > 0.05 on pre-Songkhan’s day, t test of 0.893 > 0.05 on pre-NewYear’s day, both, indicated Ho is not rejected, Ha is rejected, there is neither pre-Songkhan’s day effect nor pre-NewYear’d day effect in portfolio 1.

Table 5.8 & 5.9 studied the portfolio 2, the levene’s test of 0.194 and 0.072 proved the reliability of the test statistics. t-Test of 0.983 > 0.05 on pre-Songkhan’s day and 0.61 > 0.05 on pre-NewYear’s day, both indicated there is NO holiday effect in portfolio 2.

Table 5.10 studied the portfolio 3, the levene’s test of 0.122 showed the reliability of the test statistics, t test of 0.884 > 0.05 suggested the Ho is not rejected, there in NO pre-Songkhan’s day effect in portfolio 3.

Table 5.12 & 5.13 studied the portfolio 4, the levene’s test of 0.016 is getting closer to 0 but still not very near, and therefore, the test statistic is still
reliable. The t sig at $0.949 > 0.05$ on pre-Songkhan’s day and $0.949 > 0.05$ on pre-NewYear’s day, both indicate the Ho is not rejected, there is NO holiday effect exists in portfolio 4.

Table 5.14 & 5.15 studied the portfolio 5, the levene’s test of 0.016 showed the not very good but still reliable test statistic. The t sig of $0.949 > 0.05$ on pre-Songkhan’s day and $0.949$ on pre-NewYear’s day both suggested the Ho is not rejected, thus, there is NO holiday effect existing in portfolio 5.

Table 5.16 studied the portfolio 6, the levene’s test of 0.387 proved the reliability of the test statistic. t significant at $0.685 > 0.05$ on pre-Songkhan’s day, indicated, the Ho is not rejected, there is NO pre-Songkhan’s day effect in portfolio 6.

Table 5.18 & 5.19 studied the portfolio 7, the levene’s test of 0.016 showed the acceptance of test statistic. the t significant at $0.949 > 0.05$ on pre-Songkhan’s day, and $0.949 > 0.05$ on pre-NewYear’s day, both indicated: there is Neither pre-Songkhan’s day effect Nor pre-NewYear’s day effect exist in portfolio 7.

Table 5.22 & 5.23 studied the portfolio 9, levene’s test of 1.394 and 0.289 showed the acceptance of test statistic. t significant at $0.906$ and $0.737$, both are greater than 0.05, thus, Ho is
not rejected. There is NO holiday effect observed in portfolio 9.

Table 5.24 & 5.25 studied the smallest portfolio – portfolio 10, levene’s test of 0.016 showed the acceptance of test statistic. t significant at 0.949 and 0.949, greater than 0.05, both, indicated the Ho is not rejected, there is NO holiday effect exist in portfolio 10.

However, in portfolio 8 – both pre-Songkhan’s day effect and pre-NewYear’s day effect are founded. In Table 5.20, t sig = 0.035 < 0.05, which indicated the Ha is not rejected, there is pre-Songkhan’s day effect exist in portfolio 8. In table 5.21, t sig = 0.033 < 0.05, indicated the Ha is not rejected, thus, there is pre-NewYear’s day effect found in portfolio 8.

In addition, the levene’s test of portfolio 3 (table 5.11, SK) = 0.006 which is very closed to 0, the levene’s test of portfolio 6 (table 5.17, NY) = 0, both indicated the imperfect of the test statistic. Therefore, the Non-parametric 2 independent sample test is used for further studying.

The outputs are showed in table 5.26 and table 5.27.

For portfolio 3, Asymp is sig = 0.008 < 0.05, which indicated the Ho is rejected, means, there is pre-New Year’s day effect exist in portfolio 3.
For portfolio 6, Asymp is sig = 0.191 > 0.05, which indicated the Ho is not rejected, means there is NO pre-NewYear's day effect found in portfolio 6.

<table>
<thead>
<tr>
<th>Table 5.26 Nonparametric test for p3 (NY)</th>
<th>Table 5.26 Nonparametric test for p6 (NY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Statistics</td>
<td>Test Statistics</td>
</tr>
<tr>
<td>Mann-Whitney U</td>
<td>P6</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>4250</td>
</tr>
<tr>
<td>Z</td>
<td>Z                          -1.306</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>Asymp. Sig. (2-tailed)</td>
</tr>
<tr>
<td></td>
<td>0.008</td>
</tr>
<tr>
<td></td>
<td>0.191</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5.2 **F-STATISTIC (ANOVA)**

F-statistic (ANOVA) is used to test the equality of mean returns across size portfolios at 95 percent confident level (table 5.12)

The hypothesis is:  

\[ \text{Ho: } r_1 \neq r_2 \neq \ldots \neq r_{10} \]

\[ \text{Ha: } r_1 = r_2 = \ldots = r_{10} \]
The outcomes are showed below:

- F-test (ANOVA) for Return on Ordinary day

First, the Levne Statistic of ordinary day is significant at 0.149, indicated the reliability of the test statistic (table 5.6).

Furthermore, the outcome of F-statistic (table 5.7) showed that the F significant $=0.095 > 0.05$ significant level, suggested the Ho is not rejected: the return on Ordinary day across size decile portfolio is unequal. Means, different firms with different size have different stock returns, but such a difference with no systematic pattern observed.

| Table 5.26 Test of Homogeneity of Variances for return on Ordinary day |
|-----------------|---|---|---|
| R.O             |    |    |   |
| Levene Statistic| df1| df2| Sig. |
| 1.558           | 9  | 60 | 0.149 |
Table 5.27 ANOVA test for return on Ordinary day cross size decile portfolio

<table>
<thead>
<tr>
<th>R.O</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>5.493</td>
<td>9</td>
<td>0.61</td>
<td>1.759</td>
<td>0.095</td>
</tr>
<tr>
<td>Within Groups</td>
<td>20.822</td>
<td>60</td>
<td>0.347</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26.314</td>
<td>69</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

F-test (ANOVA) for Return on pre – Songkhan’s day

First, the Levne Statistic of pre – Songkhan’s day is significant at 0.44, indicated the reliability of the test statistic (table 5.8).

Furthermore, the outcome of F-statistic (table 5.9) showed that the F significant =0.73 > 0.05 significant level, suggested the Ho is not rejected: the return on Ordinary day across size decile portfolio is unequal. Means, different firms with different size have different stock returns, but such a difference with no systematic pattern observed.

Table 5.28 Test of Homogeneity of Variances for return on Pre-Songkhan’s day

<table>
<thead>
<tr>
<th>R.PSK</th>
<th>Levene Statistic</th>
<th>df1</th>
<th>df2</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levne Statistic</td>
<td>1.013</td>
<td>9</td>
<td>60</td>
<td>0.44</td>
</tr>
</tbody>
</table>
Table 5.29 ANOVA test for return on Pre-Songkhan’s day cross size decile portfolio

<table>
<thead>
<tr>
<th>R.PSK</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>9.597</td>
<td>9</td>
<td>1.066</td>
<td>0.673</td>
<td>0.73</td>
</tr>
<tr>
<td>Within Groups</td>
<td>95.102</td>
<td>60</td>
<td>1.585</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>104.698</td>
<td>69</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- F-test (ANOVA) for Return on pre – New Year’s day

  First, the Levne Statistic of pre – Songkhan’s day is significant at 0.406, indicated the reliability of the test statistic (table 5.10).

  Furthermore, the outcome of F-statistic (table 5.11) showed that the F significant =0.886 > 0.05 significant levels, suggested the Ho is not rejected: the return on Ordinary day across size decile portfolio is unequal. Means, different firms with different size have different stock returns, but such a difference with no systematic pattern observed.
Table 5.30 Test of Homogeneity of Variances for return on Pre-Songkhan’s day

<table>
<thead>
<tr>
<th>R.PNY</th>
<th>Levene Statistic</th>
<th>df1</th>
<th>df2</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.059</td>
<td>9</td>
<td>60</td>
<td>0.406</td>
</tr>
</tbody>
</table>

Table 5.31 ANOVA test for return on Pre-Songkhan’s day cross size decile portfolio

<table>
<thead>
<tr>
<th>R.PNY</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Between Groups</td>
<td>19.524</td>
<td>9</td>
<td>2.169</td>
<td>0.474</td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td>274.667</td>
<td>60</td>
<td>4.578</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>294.191</td>
<td>69</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER 6 CONCLUSION AND RECOMMENDATION

This chapter concludes all the study. There are two parts included in this chapter. First part is summary of findings. The second part is recommendation.

6.1 CONCLUSION

The outcome of this study by t-statistic analysis indicated that: There is NO holiday effect when the daily mean return on ordinary day and daily mean return on pre-holiday are analyzed as a whole. When further study based on each size decile portfolios, the very small holiday effect was observed. In portfolio 3, the pre-New Year’s day effect was found. Both pre-Songkhan’s day effect and pre-New Year’s day effect was presented only in portfolio 8. Thus, we may conclude that, in Thai stock market, the stock returns related to holiday effect are in a minor and insignificant way.

In addition, the outcome of F-statistic (ANOVA) suggested that, the mean returns across size decile portfolios are unequal on Ordinary day, unequal on Pre-Songkhan’s day and also unequal on Pre New Year’s day. Means, $R_1 \neq R_2 \neq$
... ≠ R_{10} in all three groups, which indicated the exists of size impact. But the systematic pattern is not found.

Overall, the performance of Thai stock market only showed the minor influence of holiday effect toward the stock returns. Size impact is found in all three groups: ordinary day, pre-Songkhan's day and pre-NewYear's day. But the systematic pattern is not presented.

The finding contrast with previous empirical studies of holiday effect and stock returns in other stock market. Jim and Park (1994) found there are abnormally high returns on the trading day before holidays in all three major U.S. stock market. At the year 1990, Robert A. Ariel, conducted the study of High Stock Returns before Holidays in the U.S. The results showed that the mean of the Pre-Holiday returns exceed the means of the Non Pre-holiday returns by nine to fourteen times for the equally- and value-weighted indices. The study related to the firm size and holiday effect in the U.S. also disclosure that, the small firms usually have more distinct holiday effect in stock returns than large-firms. In Japanese stock market, a reversal size effect is also observed for the stock returns.

The results of this study also contrast with the expected outcome of this research, which, according to the previous literature studies in other stock
market, the Thai stock market are supposed to have a pattern with the holiday effect. Means, the stock returns on the last trading day prior to the Sonkran’s Day and the last trading day prior the New Year’s Day, supposed to be higher than the ordinary days. Furthermore, the holiday effect is impacted by firm size; small firms seem to have higher stock return in pre-holiday than those larger firms.

Therefore, result of this study supports the efficient market hypothesis theory instead of holiday effect. The performance of Thai stock market is following the EMH (Emergence of the Efficient Market Hypothesis) theory: the stock prices are adjusted to the infusion of new information, the movement has no trend. Thus, holiday’s effect does not exist in Thai stock market.
After the studying of the SET and its performance related with holiday effect & firm size, below are my recommendations:

**INVESTOR:**

Holiday effect should NOT be considered as the important reference guideline for investing. For Thai stock market, the major influence to the stock price movement and the stock return still follow the market efficiency theory.

The firm size did impose an effect on the stock return, but there is no systematic pattern was observed. Therefore, the investor should not select the stock according the size, big size firm does not mean the large return, the small size firm also does not mean the small return.

Therefore, investors should catch up the latest news from all major aspects such as economic related, and politic related, technological related, both domestically and internationally. They should do their own market analysis.
besides the overall economy situation. They should study the financial performance, management strength, past record and future strategies of the particular firm that they would invest, they also should be aware for the accuracy of source of information, and be able to differentiate the real news and the rumors.

➢ ACADEMIC:

Holiday effect is not present in Thai stock market when mean return on ordinary day and mean return on pre-holiday are analyzed as a whole. Only small holiday effect were presented when analyze based on size decile portfolios, the finding is: the pre-NewYear’s day effect was found in size portfolio 3, both pre-Songkhan’s day effect and pre-NewYear’s day effect were suggested in portfolio 8.

The size impact was presented with a non-systematic manner.

Thus, the study of SET should be more focused according the market efficiency theory. Other potential influence factors that affect the stock returns should be continuously studied.
The t-statistic and F-statistic are good models in testing stock returns, the dummy variable regression analysis is the imperfect model for studying the holiday effect and stock returns across size portfolios in Thai stock market. The more appropriate method should be investigated and introduced to the stock return related studies.
Page 57 to page 62 contained the outputs of study of holiday effect and stock returns across size decile portfolios by using t-statistic:

- Portfolio 1: table 5.6 & 5.7 No holiday effect
- Portfolio 2: table 5.8 & 5.9 No holiday effect
- Portfolio 3: table 5.10 & 5.11 pre-NewYear’s day effect
- Portfolio 4: table 5.12 & 5.13 No holiday effect
- Portfolio 5: table 5.14 & 5.15 No holiday effect
- Portfolio 6: table 5.16 & 5.17 No holiday effect
- Portfolio 7: table 5.18 & 5.19 No holiday effect
- Portfolio 8: table 5.20 & 5.21 pre-NewYear’s day effect pre-Songkhan’s day effect
- Portfolio 9: table 5.22 & 5.23 No holiday effect
- Portfolio 10: table 5.24 & 5.25 No holiday effect
### Table 5.6: t-Test on portfolio 1 -- pre-Songkhan's day effect and stock return

<table>
<thead>
<tr>
<th>Independent Samples Test</th>
<th>Levene's Test for</th>
<th>t-test for</th>
<th>Equalities of</th>
<th>95% Confidence Interval of the Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1 (R.O and R.S.K)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
<td>t</td>
<td>df</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>0.093</td>
<td>0.177</td>
<td>0.032</td>
<td>1698</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>0.289</td>
<td>0.150</td>
<td>0.032</td>
<td>15.082</td>
</tr>
</tbody>
</table>

### Table 5.7: t-Test on portfolio 1 -- pre-New Year's day effect and stock return

<table>
<thead>
<tr>
<th>Independent Samples Test</th>
<th>Levene's Test for</th>
<th>t-test for</th>
<th>Equalities of</th>
<th>95% Confidence Interval of the Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1 (R.O &amp; R.NY)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
<td>t</td>
<td>df</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>0.857</td>
<td>0.151</td>
<td>-0.135</td>
<td>1698</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>-0.898</td>
<td>0.994</td>
<td>0.393</td>
<td>8.994</td>
</tr>
</tbody>
</table>

### Table 5.8: t-Test on portfolio 2 -- pre-Songkhan's day effect and stock return

<table>
<thead>
<tr>
<th>Independent Samples Test</th>
<th>Levene's Test for</th>
<th>t-test for</th>
<th>Equalities of</th>
<th>95% Confidence Interval of the Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>P2 (R.O &amp; R.S.K)</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
<td>t</td>
<td>df</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>0.121</td>
<td>0.194</td>
<td>-0.021</td>
<td>1705</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>-0.15</td>
<td>0.418</td>
<td>0.884</td>
<td>9.418</td>
</tr>
</tbody>
</table>
### Table 5.9: t-Test on portfolio 2 -- pre-NewYear's day effect and stock return

<table>
<thead>
<tr>
<th>Independent Samples Test</th>
<th>Levene’s Test for Equality of</th>
<th>t-test for</th>
<th>95% Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
<td>t</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>0.047</td>
<td>0.072</td>
<td>-0.51</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>-2.087</td>
<td>6.919</td>
<td>0.076</td>
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</tbody>
</table>

### Table 5.10: t-Test on portfolio 3 -- pre-Songkhan's day effect and stock return

<table>
<thead>
<tr>
<th>Independent Samples Test</th>
<th>Levene’s Test for Equality of</th>
<th>t-test for</th>
<th>95% Confidence</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
<td>t</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>0.974</td>
<td>0.122</td>
<td>-0.146</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>-0.8</td>
<td>7.796</td>
<td>0.448</td>
</tr>
</tbody>
</table>

### Table 5.11: t-Test on portfolio 3 -- pre-NewYear's day effect and stock return

<table>
<thead>
<tr>
<th>Independent Samples Test</th>
<th>Levene’s Test for Equality of</th>
<th>t-test for</th>
<th>95% Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
<td>t</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>0.005</td>
<td>0.006</td>
<td>-0.699</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>-2.342</td>
<td>6.595</td>
<td>0.054</td>
</tr>
</tbody>
</table>
Table 5.12: t-Test on portfolio 4 -- pre-Songkhan's day effect and stock return

<table>
<thead>
<tr>
<th>Independent Samples Test</th>
<th>Levene’s Test for</th>
<th>t-test for</th>
<th>95% Confidence</th>
<th>95% Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Equality of</td>
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<td></td>
<td>Interval of the Lower Upper</td>
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<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
<td>t</td>
<td>df</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>0.011</td>
<td>0.016</td>
<td>0.064</td>
<td>1705</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>0.999</td>
<td>1699.1</td>
<td>0.318</td>
<td>103.107</td>
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</table>

Table 5.13: t-Test on portfolio 4 -- pre-NewYear's day effect and stock return

<table>
<thead>
<tr>
<th>Independent Samples Test</th>
<th>Levene’s Test for</th>
<th>t-test for</th>
<th>95% Confidence</th>
<th>95% Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Equality of</td>
<td></td>
<td></td>
<td>Interval of the Lower Upper</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
<td>t</td>
<td>df</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>0.012</td>
<td>0.016</td>
<td>0.064</td>
<td>1705</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>0.991</td>
<td>1699.1</td>
<td>0.322</td>
<td>102.310</td>
</tr>
</tbody>
</table>

Table 5.14: t-Test on portfolio 5 -- preNewYear's day effect and stock return

<table>
<thead>
<tr>
<th>Independent Samples Test</th>
<th>Levene’s Test for</th>
<th>t-test for</th>
<th>95% Confidence</th>
<th>95% Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Equality of</td>
<td></td>
<td></td>
<td>Interval of the Lower Upper</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
<td>t</td>
<td>df</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>0.012</td>
<td>0.016</td>
<td>0.064</td>
<td>1705</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>1</td>
<td>1699.061</td>
<td>0.318</td>
<td>1452.146</td>
</tr>
</tbody>
</table>
### Table 5.15: t-Test on portfolio 5 -- pre-NewYear's day effect and stock return

<table>
<thead>
<tr>
<th>Independent Samples Test</th>
<th>Levene's Test for Equality of F</th>
<th>t-test for Equality of F</th>
<th>Mean Difference</th>
<th>Std. Error Difference</th>
<th>95% Confidence Interval of the Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P5 (R.O &amp; R.NY)</strong></td>
<td>Equal variances assumed</td>
<td>0.013 0.016 0.064 1705</td>
<td>0.949 1451.271 22641.136</td>
<td>-42956.064</td>
<td>45858.607</td>
</tr>
<tr>
<td></td>
<td>Equal variances not assumed</td>
<td>0.999 1699 0.318 1451.271 1452.433</td>
<td>-1397.474</td>
<td>4300.016</td>
<td></td>
</tr>
</tbody>
</table>

### Table 5.16: t-Test on portfolio 6 -- pre-Songkhan's day effect and stock return

<table>
<thead>
<tr>
<th>Independent Samples Test</th>
<th>Levene's Test for Equality of F</th>
<th>t-test for Equality of F</th>
<th>Mean Difference</th>
<th>Std. Error Difference</th>
<th>95% Confidence Interval of the Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P6 (R.O &amp; R.SK)</strong></td>
<td>Equal variances assumed</td>
<td>0.253 0.387 -0.405 1705</td>
<td>0.685 -0.603 1.488</td>
<td>-5.522 2.316</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Equal variances not assumed</td>
<td>-1.879 7.22 0.101 1451.271</td>
<td>-0.603 0.321</td>
<td>-1.358 0.151</td>
<td></td>
</tr>
</tbody>
</table>

### Table 5.17: t-Test on portfolio 6 -- pre-NewYear's day effect and stock return

<table>
<thead>
<tr>
<th>Independent Samples Test</th>
<th>Levene's Test for Equality of F</th>
<th>t-test for Equality of F</th>
<th>Mean Difference</th>
<th>Std. Error Difference</th>
<th>95% Confidence Interval of the Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P6 (R.O &amp; R.NY)</strong></td>
<td>Equal variances assumed</td>
<td>0 -0.077 1705 0.939</td>
<td>-0.114 1.489</td>
<td>-3.035 2.806</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Equal variances not assumed</td>
<td>0.131 6.146 0.9</td>
<td>-0.114 0.873</td>
<td>-2.237 2.008</td>
<td></td>
</tr>
</tbody>
</table>
### Table 5.18: t-Test on portfolio 7 -- pre-Songkhan's day effect and stock return

<table>
<thead>
<tr>
<th>Independent Samples Test</th>
<th>Levene's Test for Equality of Mean</th>
<th>F</th>
<th>Sig.</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
<th>Mean Difference</th>
<th>Std. Error Difference</th>
<th>Interval of the Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equal variances assumed</td>
<td></td>
<td>0.012</td>
<td>0.016</td>
<td>0.064</td>
<td>1705.000</td>
<td>0.949</td>
<td>2800.588</td>
<td>43665.030</td>
<td>-82842.093</td>
<td>88443.270</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td></td>
<td>1.000</td>
<td>0.318</td>
<td>0.588</td>
<td>2801.119</td>
<td>0.030</td>
<td>-82842.093</td>
<td>88443.270</td>
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<td></td>
</tr>
</tbody>
</table>

### Table 5.19: t-Test on portfolio 7 -- pre-NewYear's day effect and stock return

<table>
<thead>
<tr>
<th>Independent Samples Test</th>
<th>Levene's Test for Equality of Mean</th>
<th>F</th>
<th>Sig.</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
<th>Mean Difference</th>
<th>Std. Error Difference</th>
<th>Interval of the Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equal variances assumed</td>
<td></td>
<td>0.012</td>
<td>0.016</td>
<td>0.064</td>
<td>1705.000</td>
<td>0.949</td>
<td>2799.450</td>
<td>43665.030</td>
<td>-82843.232</td>
<td>88442.131</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td></td>
<td>0.999</td>
<td>0.318</td>
<td>0.588</td>
<td>2801.119</td>
<td>0.030</td>
<td>-82843.232</td>
<td>88442.131</td>
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<td></td>
</tr>
</tbody>
</table>

### Table 5.20: t-Test on portfolio 8 -- pre-Songkhan's day effect and stock return

<table>
<thead>
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<th>Independent Samples Test</th>
<th>Levene's Test for Equality of Mean</th>
<th>F</th>
<th>Sig.</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
<th>Mean Difference</th>
<th>Std. Error Difference</th>
<th>Interval of the Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equal variances assumed</td>
<td></td>
<td>0.138</td>
<td>0.177</td>
<td>-0.931</td>
<td>1705</td>
<td>0.352</td>
<td>-1.146</td>
<td>1.231</td>
<td>-3.560</td>
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<td></td>
<td>-2.174</td>
<td>6.279</td>
<td>0.071</td>
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<td>0.527</td>
<td>-2.422</td>
<td>0.130</td>
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</tbody>
</table>
Table 5.21: t-Test on portfolio 8 -- pre-NewYear's day effect and stock return

<table>
<thead>
<tr>
<th>Independent Samples Test</th>
<th>Levene's Test for</th>
<th>t-test for</th>
<th>95% Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Equality of F</td>
<td>df</td>
<td>Mean Difference</td>
</tr>
<tr>
<td></td>
<td>Sig.</td>
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<tr>
<td>Equal variances assumed</td>
<td>0.199</td>
<td>0.276</td>
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<td>Equal variances not assumed</td>
<td>-1.941</td>
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Table 5.22: t-Test on portfolio 9 -- pre-Songkhan's day effect and stock return

<table>
<thead>
<tr>
<th>Independent Samples Test</th>
<th>Levene's Test for</th>
<th>t-test for</th>
<th>95% Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Equality of F</td>
<td>df</td>
<td>Mean Difference</td>
</tr>
<tr>
<td></td>
<td>Sig.</td>
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<tr>
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<tr>
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<td>-0.643</td>
<td>7.802</td>
<td>0.538</td>
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</table>

Table 5.23: t-Test on portfolio 9 -- pre-NewYear's day effect and stock return

<table>
<thead>
<tr>
<th>Independent Samples Test</th>
<th>Levene's Test for</th>
<th>t-test for</th>
<th>95% Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Equality of F</td>
<td>df</td>
<td>Mean Difference</td>
</tr>
<tr>
<td></td>
<td>Sig.</td>
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<tr>
<td>Equal variances assumed</td>
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<td>-0.742</td>
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</table>
Table 5.24: t-Test on portfolio 10 -- pre-Songkhan's day effect and stock return

<table>
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<th>Independent Samples Test</th>
<th>Levene's Test for Equality of</th>
<th>t-test for</th>
<th>95% Confidence</th>
<th>95% Confidence</th>
<th>95% Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>P10 (R.O &amp; R.SK)</td>
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</tr>
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<td>F</td>
<td>Sig.</td>
<td>t</td>
<td>df</td>
<td></td>
</tr>
<tr>
<td>Equal variances assumed</td>
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<td>0.016</td>
<td>0.064</td>
<td>1705</td>
<td>0.949</td>
</tr>
<tr>
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<tr>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
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<td>Equal variances not assumed</td>
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<td>0.317</td>
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</tr>
</tbody>
</table>

Table 5.25: t-Test on portfolio 10 -- pre-NewYear's day effect and stock return

<table>
<thead>
<tr>
<th>Independent Samples Test</th>
<th>Levene's Test for Equality of</th>
<th>t-test for</th>
<th>95% Confidence</th>
<th>95% Confidence</th>
<th>95% Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>P10 (R.O &amp; R.NY)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
<td>t</td>
<td>df</td>
<td></td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>0.012</td>
<td>0.016</td>
<td>0.064</td>
<td>1705</td>
<td>0.949</td>
</tr>
<tr>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Equal variances not assumed</td>
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<td>1699.077</td>
<td>0.318</td>
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REFERENCES


Fact Book 2000, Statistic to December 31, 1999, The Stock Exchange of Thailand


