CALENDAR ANOMALIES IN NEPALESE CAPITAL MARKET

A Thesis

By

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CERTIFICATION OF AUTHORSHIP

I certify that the work in this thesis entitled “Calendar Anomalies in Nepalese Capital Market” has not previously been submitted for a degree nor has it been a part of requirements for a degree except as fully acknowledged within the text. I also certify that the thesis has written by me under the supervision of Associate Prof. Ajaya Pd. Dhakal. In addition, I certify that all information sources and literatures used are indicated in the reference section of the thesis.

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Sarita Bhatt

Date: 11/29/2020

RECOMMENDATION LETTER

It is certified that thesis entitled "Calendar Anomalies in Nepalese Capital Market" submitted by Sarita Bhatt is an original piece of research work carried out by the candidate under my supervision. Literary presentation is satisfactory and the thesis is in a form suitable for publication. Work evinces the capacity of the candidate for the critical examination and independent judgment. Candidate has put in at least 60 days after registering the proposal. The thesis is forwarded for examination.

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APPROVAL SHEET

We, the undersigned, have examined the thesis entitled "Calendar Anomalies in Nepalese Capital Market" presented by Sarita Bhatt, a candidate for the degree of Master of Business Studies (MBS Semester) and conducted the viva-voce examination of the candidate. We hereby certify that the thesis is worthy of acceptance.

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ABBREVIATIONS

ADF	:	Augmented Dickey-Fuller
EMH	:	Efficient Market Hypothesis
GARCH	:	General Auto Regressive Conditional Heteroscedasticity
NEPSE	:	Nepal Stock Exchange
OLS	:	Ordinary Least Square

ABSTRACT

Efficient market is a market in which prices always fully reflect available information. Capital market efficiency is tested to identify whether the market is efficient at strong form, semi-strong form or weak form. This study has examined the market efficiency of the Nepalese capital market at weak form. Existence of anomalies make the market inefficient. Calendar anomalies are identified and examined in this study.

This study focuses on the day-of-the-week anomaly, the month-of-the-year anomaly, and Holiday (Dashain) anomalies. Since, previous studies were conducted by using Ordinary Least Square (OLS) or Non-parametric and Parametric tests, this study had used GARCH (1,1) model. The GARCH (1,1) is an autoregressive conditional heteroscedastic model which is preferred over OLS to analyze time series data in the presence of heteroscedasticity in data and data clustering.

The main objective of this study is to examine the presence of calendar anomalies in the context of Nepalese stock market. For this study the NEPSE Index and Sensitive Index are undertaken. The secondary data (NEPSE Index and Sensitive Index) are collected from the official website of NEPSE. The primary data are collected by personal face to face communication method. Daily log returns are calculated and descriptive statistics are calculated. To test the presence of the anomalies GARCH (1,1) model is used.

The day-of-the-week effect is studied for the entire data set, by splitting the data into two halves and by identifying the bullish and bearish trend of the market. Month of the year effect is studied for the entire period and by splitting the data into two halves. The study has revealed that in Nepalese stock market is inefficient at weak level. Specifically, the study has revealed that the returns on Thursday are significantly higher than rest of the days for both NEPSE and Sensitive Index. The return on Ashad are significantly higher than rest of the months. No evidences of holiday effect are found from the study. It indicates that investors can develop their investment strategy to derive above average return from the market.

In sum, the Nepalese stock market is found inefficient at weak level. The calendar anomalies such as day-of-the-week, month-of-the-year are present in the market. So, the investors can utilize the findings of technical analysis to form the strategy in order to attain abnormal returns.

CHAPTER I

INTRODUCTION

1.1 Background of the study

A market in which prices always fully reflect available information is called efficient capital market *(Fama, 1970)*. In an efficient market there are no investment opportunities which can lead to abnormal returns to any investor in the capital market. The efficient market hypothesis explains that security prices follow a random walk and it should be impossible to predict future returns based on publicly available information thus investors cannot attain abnormal returns. Based on the type of information Fama (1970) had identified three forms of market efficiency namely weak form, semi-strong form and strong form of efficiency in the study. In weak form efficient market, investors cannot derive abnormal returns by using technical analysis. In the presence of anomalies markets become inefficient (*Jacobs & Levy, 2015).* It indicates that presence of anomalies in stock market may help the investors to derive the above average returns.

Anomalies are empirical results which are inconsistent with maintained theories in finance *(Schwert, 2003).* The empirical results remain unexplained under existing finance theory, especially under the Efficient Market Hypothesis (EMH). So, anomalies are considered as hurdles to efficient capital market. There can be three forms of anomalies- fundamental anomalies, technical anomalies and calendar anomalies. This study focuses on calendar anomalies. Calendar anomalies are related with particular time period i.e. movement in stock prices from day to day, month to month, and year to year which include weekend effect, turn of the month effect, and year-end effect (Latif, Arshad, Fatima, & Farooq, 2011). In the presence of calendar anomalies, a stock market anomaly depends solely on certain periods in a calendar year.

A phenomenon of unequal average daily return of the market is called day-of-the-week effect or weekend effect or Monday effect. In the markets which have the starting week day of Monday and ending weekday on Friday have experienced highest positive return on Friday and lowest negative returns on Monday (Shahid, 2015). The

tendency of highest average return in the months of January and the lowest average returns in the months of December is called month-of-the-year effect or January effect. The tendency of stock returns being significantly higher before the holidays and lower after the holidays is called 'Holiday Effect'.

Calendar anomalies comprising turn-of-the-month, turn-of-the-week, turn-of-the-year and holiday effects were identified by Lakonishok and Smidt (1988) in American capital market, Dodd and Gakhovich (2018) identified holiday effect in European stock markets, Winkelried and Iberico (2015) identified day-of-the-week effect in Latin American stock markets, Swami (2011) identified day-of-the-week effect in south Asian stock markets involving Srilanka and Bangladesh but not in Nepal, Pakistan and India. In Nepalese capital market, KC and Joshi (2005) have identified significanlty negative return on Thursday whereas Dangol (2010) has identified significanltly higher returns during Baisakh to Shrawan and significanlty lower reuturns during Poush to Falgun. The studies in Nepalese context were undertaken by using Ordinary Least Square (OLS) model or parametric and non-parametric tests like t-test, Mann-whitney test and Kruskal Wallis test. However, there is absence of studies in Nepal investigating the calendar anomalies using autoregressive condititional heteroscedasticity models like GARCH (1,1), EGARCH, and TARCH.

This study has investigated calendar anomalies in Nepalese stock market employing GARCH (1,1) model. The calendar anomalies under the study are day-of-the-week effect, month-of-the-year effect and holiday (Dashain) effect. For day-of-the-week effect existence of above average normal return are examined in all trading days of the week in which trading takes place in NEPSE (Nepal Stock Exchange). Whereas, month-of-the-year effect is examined with reference to the Nepalese Bikram Calendar including the months from Baisakh to Chaitra. Monthly average returns are examined to identify persistence of any abnormal returns in any month-of-the-year in NEPSE. For holiday effect, the effect of largest and most celebrated holiday, Dashain, is taken for examination. To study the holiday effect, the return on day before and after Dashain are examined to identify any pattern of returns.

1.2 Statement of the Problems and Questions

The studies conducted in international capital markets suggest mixed evidence of calendar anomalies. Rozeff and Kinney (2014) conducted empirical study to examine seasonality in the United States stock market and found statistically significant differences in mean returns among months. However, Lindley, Liano, and Slater, (2004) identified no significant January effect. Tonchev and Kim (2004) identified mixed results of calendar effect observed in Eastern European Countries stock markets with significant returns in no one month consistently.

Along with month-of-the year effect, different day of the week effects were identified in different markets. Patel, Radadia and Dhawan (2012) examined day-of-the-week effect in four selected stock markets in Asia namely Bombay Stock Exchange (BSE), Hong Kong Stock Exchange, Tokyo Stock Exchange and Shanghai Stock Exchange. This study identified that BSE Sensex had given maximum average return on Wednesday; Hang Seng has given highest returns on Friday, whereas, Nikkei and SSE Composite have given highest return on Thursday and Wednesday respectively.

Also, there were mixed findings on holiday effects. Dumitriu, Stefanescu and Nistor (2012) examined the possible holiday effects in the stock returns from a group of 28 countries and found significantly lower returns prior to holiday and significantly higher return after the holidays. However, Yun (2011) identified significantly positive return in preholiday in Chinese capital market; Lucey (2005) found no existence of holiday effect in Irish stock exchange; and Sukor and Edil (2012) found significantly lower returns in five emerging Asian stock markets (Hong Kong, Indonesia, Malaysia, Singapore and Taiwan) before holiday and higher returns after holidays.

In Nepal also, attempts were made to find out the calendar anomalies. The stock market anomalies in Nepal may not be consistent with the international markets because in Nepal the trading day starts on Sunday and ends on Thursday. Also, the trading days depend on the Bikram Calendar. Studies have been conducted in Nepalese capital market to trace the Calendar Anomalies. K.C. and Joshi (2005) identified the the existence of day-of-the-weekanomaly with significantly highest returns on Thursday and insignificant but higher return in October.

However, Dangol (2010) studied the month-of-the-year effect by grouping a number of subsequent months to identify if they generate signficanlty different return than

other months of the year. From the study, it was found that the return from April/May (Baisakh) to July/August (Shrawan) was signficantly higher than rest of the months whereas, the return from December/January (Poush) to February/March (Falgun) was significantly lower than rest of the months.

Studies by Pant (2010) and Maharjan (2013) found two separate day-of-the-week effects in NEPSE. Pant (2010) identified significantly highest return on Friday whereas Maharjan (2010) identified the significantly highest returns on the Thursday and lowest return on Tuesday. Pant (2010) identified significantly lower returns during poush and Falgun. Whereas, Maharjan (2013) identified significanlty higher returns in Jestha and significantly lower returns in Shrawan.

These studies does not have consistent results, thus, a new study is needed to identify the real situation of calendar anomalies in NEPSE. The anomalies identified by K.C. and Joshi (2005), (Pant, 2010), and (Maharjan, 2013) were based on the Ordinary Least Square (OLS) method. In the presence of Heteroscedasticity and data clustering, results from such method may be flawed. No study has been published in Nepal which have investigated the calendar anomalies using GARCH (1,1) model (a model which gives fair results even if there is heteroscedasticity and clustering problem in the data). To fulfill the gap of knowledge about the existence of calendar anomalies in Nepalese stock market a study is necessary. The study deals with the following issues:

i. Does day-of-the-week effect exist in Nepalese stock market?

ii. Does month-of-the-year effect exist in Nepalese stock market?

iii. Does Holiday-Effect (Dashain Effect) exist in Nepalese stock market?

1.3 Objectives of the study

The main objective of the study is to examine the weak form efficiency of the Nepalese Stock Market. The specific objectives are as follows

i. To examine the existence of day-of-the-week effect on stock returns.

ii. To examine the existence of month-of-the-year effect on stock returns in NEPSE.

iii. To examine the existence of holiday (Dashain) effect on stock returns in NEPSE.

1.4 Research hypothesis

The following alternative hypotheses are proposed for the study

H_1: Mean return of on at least one week day is significantly different from other days of the week.

In NEPSE, K.C. and Joshi (2005), identified day-of-the-week anomaly with significantly lower returns on Thursday. However, Pant (2010) identified significanlty higher returns on Friday. Maharjan (2013) identified significanlty higher return on Thursday and significanlty lower returns on Tuesday.

H_2: Mean return in at least one month is significantly different from return in other months of the year.

K.C. and Joshi (2005) identified insignificant higher return in the month of October. Maharjan (2013) identified significantly higher returns in May/June (Jestha) and significantly lower returns in July/August (Shrawan).

H_3: The return on pre-Dashain is significantly lower than the return on post-Dashain. KC and Joshi (2005) found disappearing holiday effect. Whereas, Pant (2010) identified the returns on pre-Dashain time were significantly lower than rest of the time.

1.5 Significance of the study

This study aims to investigate the existence of calendar anomalies using a more efficient statistical tool called GARCH (1, 1) model. Existing studies on calendar anomalies in Nepal are conducted by using OLS model and some studies are also conducted using Student's t- test, Mann-Whitney test and Kruskal Walli's test. Findings of such research may be faulty in the existence of heteroscedasticity of data and data clustering. A study to investigate calendar anomalies using GARCH (1, 1) model can contribute the knowledge immensely. Except contributing to the knowledge of the scholars in the investment field, the findings of this research can be used by the investors to formulate strategies which can provide them above average returns. Such findings can also provide ideas to the regulators of Nepalese stock market to formulate policies in order to enhance the efficiency of the market.

1.6 Limitations of the study

In general almost study carries some limitations. The limitations of the study are

i. It does not incorporate fundamental anomalies, technical anomalies and investor specific biases.

ii. The scope of the study is be limited to the day-of-the-week effect, month-of-the-year effect and holiday (Dashain) effect.

iii. This study may be subject to sampling and non-sampling errors.

iv. Limitations associated with the GARCH (1, 1) model are the limitations of this study too.

Despite these limitations, this study has tried to provide valid result as well as in depth of Calendar anomalies in Nepalese Capital market.

1.7 Organization of the study

This study focuses on the investigation of the Calendar anomalies in Nepalese capital market. With the intent of the above broad objectives attainment, the study is organized or structured as follows:

Chapter I: Introduction

The first chapter of this study involves the background information on efficient market hypothesis and this study, statement of problem, objectives, significant of the study, and limitations of the study of this study.

Chapter II: Literature Review

Second chapter deals with review of literature of previous studies associated with calendar and seasonal anomalies on stock returns. It involves efficient market hypothesis, calendar anomalies, day-of-the-week effect, month-of-the-year effect, tax-loss hypothesis, window- dressing hypothesis, holiday effect, calendar anomalies in Nepalese Capital Market which were found by the previous researches.

Chapter III: Research Methodology

This chapter presents the research design and methodology utilized in this research. The research design and methodology includes the planned methods used while conducting the research which has helped to guide the research towards its main findings and conclusion. It includes information on research design, data analysis

methods, questionnaire, population and sample size, sampling techniques, data collection instrument, software used for analysis, data analysis tools and GARCH (1,1) model.

Chapter IV: Result

The fourth chapter deals with the main results of the study. After the collection of data and processing it is necessary to showcase the result and analyze the findings. Hence, this chapter includes furthermore separately day-of-the-week effect, month-of- the-year effect and holiday (Dashain). Finally, it involves listing of major findings of the study.

Chapter V: Conclusion

This chapter outlines the summary of results and suggestions for further research. This is final chapter of the research work; hence it revolves around showcasing summarized report of whole work. It focuses on concluding the work highlighting the main findings as well as making recommendations and providing guidelines for the prospective users, readers and future researchers.

CHAPTER II

LITERATURE REVIEW

Review of literature means looking back or past event of experiences. Every scientific research must be based on past knowledge. The previous studies cannot be ignored because it provides the foundation to the present study of the perspective titles. So this chapter contains review of the relevant literature in the published books, journals, articles, theses and previous research works related to the past study.

This chapter presents the review of the past studies that were conducted in and outside Nepal. The chapter is divided on the basis of topics which involve Efficient Market Hypothesis (EMH), calendar anomalies, day-of-the-week-effect, month-of-the-year effect, holiday effect and calendar anomalies in Nepalese stock market.

2.1 Efficient market hypothesis

EMH is the backbone of traditional finance which asserts that markets are efficient. In 1965 paper, Fama explained that in an efficient market, on the average, competition will cause the full effects of new information on intrinsic values to be reflected instantaneously in actual prices (Clarke, Jandik, & Mandelker, 2001). EMH is one of the most debated theory in finance. "The efficient market hypothesis states the premise that all information has already been reflected in a security's price or market value, and that the current price the stock or bond is trading for today is its fair value" (Ricciardi & Simon, 2000). In efficient markets it is thus impossible to beat the market by acquiring higher returns. All the investors are equally aware about the risk and return of the securities and the company fundamentals. To portray this concept further, Jensen (1978) has mentioned "A market is efficient with respect to information set θ if it is impossible to make economic profits by trading on the basis of information set θ." It indicates that any information existing in the market can only provide an investor a return which is equal to the average earnings of other investors. This assumes an informationally efficient market.

Beyond informational efficiency, Malkiel (2003) has portrayed that in an efficinet market, even uninformed investors buying a diversified portfolio at the some prices given by the market will obtain a rate of return as generous as that achieved by the experts. This exhibits that under an efficient market every investor has a homogenous

rate of returns. There is no scope for fundamental and technical analysis to derive extraordinary return from the market.

According to Fama (1970) market efficiency can be measured in three forms: weak form, semi-strong form, and strong form. In a market which is efficient to weak form, the stock prices fully reflect all the available past information. In a semi-strong form efficient market the stock prices reflect all the public information. Whereas, in a market which is efficient to the strong form, the market prices fully reflect all the past, publicly available and private information. This division of market efficiency makes the EMH clearer to understand. The markets can be classified in different types based on their type of efficiency.

Challenges to efficient market theory are provided by the findings of advocates of behavioral finance. Scholars doubt about the existence of the fully efficient market. Grossman and Stiglitz (1980) had portrayed that perfectly informationally efficient markets are an impossibility for, if markets are perfectly efficient, there is no profit to gathering information, in which case there would be little reason to trade and markets would eventually collapse. This means that there are anomalies persistent in the market. Human beings cannot behave in fully rational manner and thus investors' biases and patterns of investment leads to anomalies in the stock market. Malkiel (2003) had pointed out as long as stock markets exist, the collective judgment of investors will sometimes make mistakes. Undoubtedly, some market participants are demonstrably less then rational. As a result, pricing irregularities and predictable patterns in stock returns can appear over time and even persist for short periods. Such pricing irregularities and predictable patterns so called anomalies are the hints to beat the market.

2.2 Anomalies in the capital market

The emergence of concept of anomalies can be traced back to Kuhn (1970) when the concept of paradigm shift was introduced in finance from traditional finance to modern behavioural paradigm. Kuhn predicted that EMH will be threatedned by anomalies and when these anomalies won't be explained under the existing dominant paradigm, paradigm shift will take place. Following the assertion of Kuhn, Chew (1999) had pointed out that the evidences of anomalies started gathering together in every triumph of modern finance theory over efficient markets theory. Such

anomalies are interesting matters of study for scholars at present.

Anomalies are empirical results that seem to be inconsistent with maintained theories of finance (Schwert, 2003). Such anomalies may involve fundamental anomalies, technical anomalies and calendar anomalies.

2.3 Calendar anomalies

The identification of seasonal patterns in returns may help the investor to gain abnormal profit from the market. Such patterns which depends on calendar are called calendar anomalies. Calendar anomalies include Month-of-the-year effect (also called January effect), day-of-the-week effect (also called Monday effect), half-month effect, lunar effect, turn-of-the-month effect and holiday effect. Stock returns, especially returns on small stock, are on average higher in January than in other months (Rozeff, 2014). Such anomaly is called month-of-the-year effect. Monday returns are on average lower than returns on other days (Cross, 1973 & French, 1980). This tendency is called Monday effect or day- of-the-week effect. Returns are on average higher than the day before a holiday and the first-half-of-the-calendar month (Ariel, 1987). This is called half month effect. These anomalies may not persist over a long period of time. Since, the awareness on the people change and there may occur changes in the trading habits of people over time, the calendar anomalies may not exist later. Anomalies are strange myth and hard to predict as they can appear, disappear and reappear (Schwert, 2003). This indicates that anomalies are not long lasting phenomenon. In the similar accent, Malkiel (2003) has pointed out the general problem with these predictable patterns or anomalies is that they are not dependable from period to period. So, anomalies may exist, get lost or change unknowingly and hence one may not have prudently detected them and acquired an abnormal rate of return.

2.4 Day-of-the-week effect

The tendency of significantly different return in any day-of-the-week than other days is called day-of-the-week effect. Kiymaz and Berument (2003) conducted a study by using GARCH (1, 1) model and found the presence of day-of-the-week effect in return and volatility equations in the stock markets of Japan, Germany, UK, US and Canada. It indicates that the day which is detected to have an anomaly can be utilized by an investor to attain abnormal returns.

Similarly, a study conducted by Winkelried and Iberico (2015) in Latin American stock market revealed existence of day-of-the-week anomalies. The study was based on daily stock market data from 1995 to 2014. The Latin American countries under study were Argentina, Brazil, Chile, Columbia, Mexico and Peru. Monday returns were found negative in all six countries and Friday returns are highest and positive in all five countries. Such anomaly can be termed as Monday effect also. In such markets buying on Monday and selling on Friday can lead an investor to attain above average returns.

Furthermore, Lean, Smith, and Wong (2007) conducted study to test the existence of day- of-the-week and January effects for major stock market in Asia (Japan, Hong Kong, Taiwan, Indonesia, Thailand, Singapore and Malaysia) using daily data for the period from 1988 to 2002. The objective of this paper was to find whether investors can maximize their expected utility by exploiting calendar anomalies in their portfolios. The tools used for this study was Davidson and Duclos test, which is a powerful non-parametric Stochastic Dominance (SD) test. The empirical results supported the existence of weekday and monthly seasonality effects in some Asian markets but also suggested that first-order SD for the January effect has largely disappeared. It is found that Monday returns are dominated by the other weekdays and Friday dominates other weekdays. While, the January effect has largely disappeared from Asian markets and that only in Singapore is January dominated by some other months. This study suggests that in the presence of short selling facility buying on Monday and selling on Friday can make investor better off. Also, in Singaporean capital market above average market returns can be attained by buying in January and selling in any other months of the year.

However, another study was conducted in major four Asian stock markets by Patel, Radadia, and Dhawan, (2012) revealed some different findings. The study was conducted by undertaking a sample from year 2000 to 2011 involving Bombay Stock Exchange of India, Honkong Stock Exchange of Honkong, Shanghai Stock Exchange of China and Tokyo Stock Exchange of Japan. As per the findings, the return distributions in all market were not normally distributed. In Hang Seng, maximum average return was on Friday with highest standard deviation on Monday. In Nikkei, the highest return was on Thursday and rest of the days the average returns were negative. The maximum volatility was found on Monday. In SSE, the maximum

average return was on Wednesday. The maximum volatility was found on Monday. The Monday was a day of high volatility in Asian markets understudy. This may be because of the trading gaps of non-working days prior to Monday. There was no evidence in favor of the day-of-the-week effect findings suggested that investor could not predict market behavior and may not have opportunities to improve their returns by timing their investments during whole period and all the three sub-periods for any of markets understudy of Asian region.

In contrary, a study conducted by Chia, Liew, Wafa, and Wafa (2008) in the four east Asian stock markets of Taiwan, Singapore, Hong Kong and South Korea revealed the existence of significant day-of-the-week effects, including the typical negative Monday and positive Friday effects, in all these markets except the South Korea stock market. This indicates finding of similar results as of Lean, Smith, and Wong (2007).

Taking alone the south asian countries an extensive study was conducted by Swami (2011) by undertaking India (sensex from 1991 to 2001), Srilanka (Milanka Index for 1991 to 2001), Pakistan (KSE-100 Index from 1996 to 2002), Bangladesh (General Index from 1991 to 2001) and Nepal (NEPSE Index from 1997 to 2001). From the study, the day-of- the-week effect, was found to exist in Sri Lanka and Bangladesh. The Tuesday and Friday returns were found to be negatively and positively different from zero respectively for Sri Lanka, while in case of Bangladesh, the returns on Monday was significantly negative and that on Thursday and Saturday were significantly positive. The rest of the countries had not experienced any day-of-the-week anomaly for the period covered by the study. The Month-of-the-year effect did not occur in any of the five countries studied. It might be noted that while some regularity or the other had been found for India, Sri Lanka and Bangladesh, no such anomaly had been revealed for Pakistan and Nepal. The findings of this study may need revision now a days because it involves a data from a long time back. At present the anomalies might have changed or disappeared.

Similarly, taking specific countries, an extensive study by Rahman (2009) which involved the three indices of Dhaka Stock Exchnage (DSE): All Share Price Index (DSI), DSEGeneral Index (DGEN) and DSE 20 Index (DSE 20) from the period 2005 to 2008. The result indicated that for all the three indices mean returns for Sunday and Monday are negative and for all other days mean returns are positive. Only positive returns on Thursdays were statistically significant for all the three indices. Result also

revealed that the mean daily returns between two consecutive days differ significantly for the pairs Monday-Tuesday, Wednesday-Thursday and Thursday-Sunday for all the three indices. For the other pair of days mean returns did not differ significantly. This indicates the existence of day of the week effect. Investors would be better-off selling on Thursday.

Similarly, In India also day-of-the-week effect is found prevalent. A study in Bombay Stock Exchange of India by (S, Safeer, & Kevin, 2014) had concluded the presence of Monday-Effect in Indian market conditions but no presence of turn of the month effect.

In another nearby country of Nepal, China, Gao and Kling (2005) revealed significantly positive average return on Friday in Shanghai and Shenzhen Stock Exchanges. This indicates existence of day of the week effect in the neighboring countries of Nepal.

In another South-Asian country, Pakistan, Shahid (2015) had found the existence of negative returns on Monday, Wednesday and Thursday and highest positive returns on Friday. The study was conducted by undertaking KSE 100 Index from 2008 to 2012. It shows that buying on Monday, Wednesday or Thursday and selling on Friday can make investor better-off.

The EMH is based on the assumption that there are no transaction costs. A study conducted by Caporale and Zakirova (2016) after adjusting the transaction costs in returns in Russian Stock Market found substantial evidence to conclude that the stock market is efficient. This is a proof that the stock markets may be efficient if there are no transaction costs and easy arbitrage opportunity. However, present study centers on detection of anomalies without adjusting the transaction costs.

2.5 Month-of-the-year effect

A study conducted by Boudreau (1995) revealed the presence of January effect in the stock markets of Denmark, France, January, Norway, Singapore/Malaysia, Spain and Switzerland. This study had incorporated the major stock markets over Europe and Asia. Since, study was conducted long ago, the anomalies might have changed or elapsed over time.

Similarly, in Australian capital market some studies are conducted to identify the

calendar anomalies. In the Australian stock market Seasonal effects having significantly higher returns in January and July were observed by Gray and Tutticci (2007) in Equally Weighted (EW) Index but these effects were not observed in Value Weighted (VW) Index of the same market. However, different findings were illustrated in further research works. In the study of Marrett and Worthington (2011) using Capitalizatiion-weighted Index, at the market level, evidence was found of significantly higher returns in April, July and December (up to nearly three times higher than average returns across all months). The impact for small cap firms was even more pronounced with January, August and December returns being 5.3, 3.9 and 4.9 times higher than mean returns throughout the year. At the sub-market level, month-of-the-year effects were found in the diversified financials, energy, retail, telecommunications and transport industries, but not in the banking, healthcare, insurance, materials and media industries. Of these, the most substantial month- of-the-year effects at the industry level relative to mean industry returns were January returns in the retail industry which were more than twice as low as returns in other months of the year and in the telecommunications industry where they were more than thirty-three times higher. This was an extensive study involving the detection of calendar anomalies in the different industries. In sum, these studies revealed that Australian stock markets are not efficient at weak level and month-of-the-year anomaly persists.

In the stock market of Bangladesh, Dhaka Stock Exchange (DSE), evidences by Rahman and Amin (2011) suggested there is persistence of month-of-the-year anomaly. It involved data from 2005 to 2008. For analysis purpose, OLS and GARCH (1,1) model were used. The result indicated that for all the three indices mean returns for January, February, March,

April and July were negative and for May, June, September, November and December monthly mean returns were positive. Furthermore, in the same stock market, presence of May effect was found by Abedin, Chi, and Bin (2015). This study was based on data from 2000 to 2012 of DSE all share Index (DSI), DSE – 20 Index (DSE – 20) and DSE general Index (DGEN). For the analysis purpose, student's t – statistics, ANOVA and dummy variable regression model were used in the study these finding indicate that in Dhaka stock exchange it is possibility to attain abnormal return by investing in any other months and reaping the benefits in May. The different

findings in the same stock market can be attributed to the use of different methodology and the time period of study.

Due to geographic proximity, it is always worth considering the nature of anomalies found in the Indian stock exchanges. Patel J. B. (2008) revealed that mean returns for the months November and December are significantly greater than mean returns during the remaining ten months of the year and mean returns for March through May are significantly less than those during the remaining months. This study was based on the findings in the two major stock markets of India are BSE (Bombay Stock Exchange) and NSE (National stock exchange). These findings were contradicting with previous studies where returns on January were found dominating the other months of the year. This is because anomalies may change over time.

Similarly, in Pakistani capital market, Shahid (2015) had found the persistence of negative returns on May, August and December along with significantly positive returns in March. This study had undertaken KSE 100 Index for the period from 2008 to 2012. It indicates that month of the year effect is present in Pakistani stock market.

Furthermore, Gao and Kling (2005) study in the two major stock exchange- Shanghai Stock Exchange and Shenzhen Stock Exchange of China revealed that the highest returns could be achieved after the Chinese year-end in March and April. Chinese new-year ends in February and ends in March thus January effect could not be seen in the market. This provides evidence that Chinese stock markets are not efficient at weak level.

2.5.1 Tax-loss selling hypothesis

This hypothesis was first suggested by Branch (1977). Branch (1977) has explained that investors, wanting to realize capital losses in current tax year, create a downward price pressure at the year-end (December) on securities that have previously experienced negative return. Subsequently, at the beginning of the new tax year (January), this selling pressure is relieved and the affected securities earn excess return as their prices rebound. Furthermore, because small firms' stock returns are more volatile than large firms' returns, small-firm stocks are more likely to have generated usable tax losses and therefore be candidates for tax loss selling. This can be a probable reason for month-of-the-year anomaly. Since, Nepalese fiscal year starts on July/August (Shrawan) of Bikram calendar, this effect can be irrelevant in the

months of December and January. However, similar effects can be observed during the months of June/July (Ashad) and July/August (Shrawan) of Bikram calendar.

2.5.2 Window-dressing hypothesis

Lakonishok, Shleifer, Thaler and Vishny (1991) explained that institutional managers are evaluated based on their performance and their investment philosophy. To improve their performance, the institutions buy both risky stocks and small stocks but sell them before the end of the year so that they do not show up in their year-end holdings. At the beginning of the following calendar year (in January), investment managers reverse the process by selling winners, large stocks, and low risk stocks while replacing them with small and risky stocks that typically include many past losers. This can serve as a reason for month-of-the- year anomaly. However, it need to be observed in respect of Bikram Calendar because Nepalese fiscal year starts in July/August (Shrawan).

2.6 Holiday effect

The holiday effect is associated with the significant difference between the stock returns of the day that precedes or follows the public holidays, and the rest of the trading days. Studies suggest that the holiday effect can be explained by the fact that holidays affect a human trader's mood and attitude this is called holiday effect.

According to Lu and Patel (2016) the holiday effects have two forms, The pre-holiday effect, shown by abnormal daily retunes before holidays, the public the post-holiday effect, shown by abnormal daily returns after the public holidays Studies have shown holiday effects. For example, Roll (1983) observed high rates of return on the last trading day of December; Lakonishok and Smidt (1988) reported high rates of return around Christmas; Barone (1989) identified holiday effect for Italian Stock market; Cadsby and Ratner (1992) for Canada, Japan, Australia and Hong Kong but not for the European markets; and Jaleel (2003) for Sri Lanka (cited in Joshi, 2005). This indicates that holidays are having essential impact in determination of stock market return. A proper assessment of holidays' impact may lead to derivation of above average returns.

Similarly, Cao, Premchandra, Bhabra, and Tang (2009) found traces of holiday effect in stock marekts of Newzealand. This study incorporated the daily stock market Index return from 1967 to 2006. The analysis was done with the use of OLS method. In the

study, the analysis of individual holiday returns indicated that the pre-holiday mean return is highest prior to Christmas, followed by Easter. This represents that an investor can enjoy above average return by buying in other time and selling during the pre-Christmas or pre-Easter time.

Furthermore, a study to investigate the return effect in each East Asian stock markets during the trading session when there is no trading on other East Asian stock markets was conducted by Bashir and Zeb (2015). The empirical results on lagged effect of holidays showed that information inflow and flow of investment due to portfolio adjustment plays a vital role in market activities. If one market is closed in the region it has effect on the following days return due to portfolio adjustment. Not only returns are being affected but volatility of the market as well. This effect may be attributed to movement of capital of investors from one market to other market

Dodd and Gakhovich (2018) had investigated the holiday effect in fourteen emerging Central and East Eurpopean (CEE) markets. They found that the holiday effect was present in the CEE region, with a number of ocuntries showing abnormal pre-holiday returns. They have taken national indices of each market for the sample period of 1991 to 2010. Pre- holiday was the last trading day before the public holiday and post-holiday was the first trading day after the public holiday. A sample of fourteen CEE countries were used to analyse pre-holiday and post-holiday returns. Also, addditionally examined stock market returns around specific public holidays and the presistence of the holiday effect. Lastly, the study evalueated stock liquidity before holidays. Further analysis by specific holidays showed that the holiday effect in CEE markets was driven by abnormal returns around common holidays: Christmas, New Year and Easter. Pre-holiday returns decrease over time for most markets.

Lu and Patel (2016) conducted a study in Indian capital market to examine the holiday effect by taking six indices namely BSE SENSEX, BSE 100, BSE MIDCAP, BSE 500, BSE Finance Sector and BSE Energy Sector for the period of 2005 to 2012. The results showed significantly higher returns on the trading day following a public holiday, relative to regular trading days. Furthermore, significant holiday effects were found, both statistically and economically, during the financial crisis. However, none of the indices showed any pre-holiday effect during the financial crisis.

In Nepal, K.C. and Joshi, (2005) found no evidence of Holiday effect where

significant day-of-the-week effect was identified. However, Pant (2010) had identified significantly lower return during the Krishna Pakchha of pre-Dashain period. New study to identify the Holiday effect has remained to be done.

Dashain is a major Hindu festival which is celebrated by most Nepalese. It is the festival with longest holiday. The impact of Dashain holiday in Nepalese stock market is essential to be examined.

2.7 Calendar anomalies in Nepalese capital market

In Nepal also some scholars have studied the presence of calendar anomalies. K.C. and Joshi (2005) pointed out no significant evidences for month-of-the-year effect, holiday effect, half-month effect, turn-of-the month effect and time-of-the-month effect while significant day-of-the-week-effect with significantly positive returns on Sunday and significantly negative returns on Thursday. These findings were based on NEPSE data from February 1, 1995 to December 31, 2004 and used OLS method. The anomalies identified with this study seems to have changed over time.Similarly, another interesting study was conducted by Dangol (2010) in which some traces of month-of-the-year anomalies were found. According to Dangol (2010) "First, average monthly returns for four months from April/May (Baishakh) to July/August (Shrawan) are significantly greater than the average monthly returns of remaining eight months of the year. Second, mean returns for Paush (December/January) to Falgun (February/March) are substantially less than those for the remaining nine months of the year." These findings were based on the Nepse Index from mid-August 2001 to mid-July 2009 and used t-test, Mann-Whitney test, and Kruskall Walli's test. The higher return during the Baisakh to Shrawan can be attributed to the possibility of predicting of the financial position of the organization listed in NEPSE. Such estimation can help to know which companies are going to give dividends or bonuses. Also, in the Month of Ashad, new budget is brought by the government of Nepal and hence people are more enthusiastic. On the other hand the lower return during Poush to Falgun might have occurred because there are no new offerings from the companies that investors can expect from the companies, bonuses are already provided this is the time when investors remain passive and sell off their holdings. Pant (2010) also identified the presence of Poush to Falgun effect akin to the findings of Dangol (2010). Significantly higher returns on Friday was also identified by the study. This study also revealed that stock returns are significantly lower during

Ashwin Krishna Pakchha, the pre-Dashain period. After the study of K.C. and Joshi (2005) the day-of-the- week effect seems to have changed from higher returns on Sunday to Thursday.

Similarly, as per the findings of Maharjan (2013) Nepalese stock market provides highest positive returns on Thursday and highest negative returns on Tuesday. Furthermore, it provides highest positive returns in the month of Jestha and highest negative retunrs in the month of Shrawan. Unlike K.C. and Joshi (2005) and Pant (2010), this study found the highest significantly positive returns on Thursday. These findings provide a picture that the day-of-the-week anomalies are changing from highest returns on Sunday to Friday and Friday to Thursday. Maharjan (2013) also found highest positive returns in the month of Jestha and highest negative returns in the month of Shrawan.

Furthermore, Sharma (2015) studied the calendar anomalies comprising, month-of-the- year, holiday and half month effect in Nepalese stock market. A sample of 14 years from July 16, 2000 (Shrawan, 2057) to July 15, 2016 (Ashad, 2073) were undertaken. NEPSE Index, Sensitive Index and Banking Index published by Nepal Stock Exchange were undertaken for the period. The study led to identification of significantly higher and positive return in the month of Ashad in NEPSE Index, Banking Index and Sensitive Index. Furthermore, highest significant positive return was found in Thursday. In case of half month effect, positive and significantly different mean return was found in second half of the month than first half of the month. The review of literatures for identification of calendar anomalies in Nepalese stock market reveal day-of-the-week, month-of-the-year and holiday anomalies.

2.8 Research Gap

Existence of anomalies in the capital market makes the market inefficient. Calendar anomalies are specific trading patterns of the investors during specific calendar dates. Calendar anomalies provide opportunities for the investors to employ technical analysis to frame investment strategies to derive abnormal returns from the market. There is persistence of anomalies in national and international capital markets. Evidences show that Nepalese stock market is inefficient at weak level. The past studies were conducted using OLS, t-test, Mann Whitney test and Kruskal Walli's test. There are no studies conducted using GARCH (1,1) and EGARCH (1,1) model. GARCH (1,1) model has advantage over OLS in the case of existence of data

clustering and heteroscedasticity in data. This model can give better results in such case. So, as to find out the existence of real scenario of calendar anomalies using GARCH (1,1) model, this study is conducted.

CHAPTER III

RESEARCH METHODOLOGY

This chapter is designed to explain the research methods used to meet the stated objectives of the study. This chapter hence provides information about research design, sources of data, questionnaire, data collection procedures, pilot study, population and sampling, instrumentation, administration of instrument and data analysis plan. Also, the specific model used for the analysis called GARCH (1,1) is also defined.

3.1 Research design

This study has adopted descriptive research design. To investigate the calendar anomalies in the study, it is essential to find out the patterns in the stock returns. With descriptive design, the data are collected and analyzed using some statistical tool. Such statistical tool show the actual patterns persisting in the Nepalese stock market. Inferences are made from the found patterns but it does not aim to apply those findings. This study has attempted to identify and examine the calendar anomalies in the NEPSE. The available NEPSE data on the stock market return are collected and analyzed to meet the purpose.

3.2 Population and sample

The population of this study are NEPSE Index and Sensitive Index since the incorporation of the Nepal Stock Exchange (NEPSE). The sample for the study are 16 years NEPSE Index starting from July 16, 2003 (Shrawan, 2060) to July 15, 2019 (Ashad, 2076) and Sensitive Index from the start that is September 12, 2009 (Bhadra, 2066) to July 15, 2019 (Ashad 2076).

NEPSE Index is the value weighted Index comprising all the listed securities of NEPSE. Whereas, Sensitive Index is the Index of 'A' grade companies in NEPSE. NEPSE categorizes its overall listed companies in two categorizes, some are graded 'A' where others are not recognized by any specific name. Since, sensitive Index are point of attraction for most of the value investors, it is essential to study the seasonal anomalies in the securities returns of such companies.

The study by K.C. and Joshi (2005) used a sample of 10 years from February 1, 1995

to December 31, 2004. Whereas, Dangol (2010) study included the sample of 10 years from August 15, 2001 to July 15, 2009. Pant (2010) used a sample of 12 years from July 16, 1997 to June 15, 2009. Maharjan (2013) used the data of 11 years from August 16, 2001 to July 15, 2012. Since, previous researcher have used the sample of 10 to 12 years to investigate the calendar anomalies, the sample size of this study is also justified.

3.3 Sources of data collection

The historical data of NEPSE Index and Sensitive Index were collected from the annual reports of Nepal Stock Exchange which were retrieved from the website www.nepalstock.com.np.

In this research secondary data has been used, collected from NEPSE Index starting from July 16, 2003 (Shrawan, 2060) to July 15, 2019 (Ashad, 2076) and Sensitive Index from the start that is September 12, 2009 (Bhadra, 2066) to July 15, 2019 (Ashad 2076).

3.4 Methods and tools of data analysis

This study has used descriptive statistics comprising Mean and Standard Deviation along with GARCH (1,1) Model to test the presence of the anomalies in the Nepalese Stock Market. The significance of the coefficients are tested with the p-values obtained. The data are presented with the help of tables and graphs as per necessity. Kiymaz and Berument (2003) Caporale and Zakirova (2016) have used GARCH (p,q) model model for their study. This model is popular now a days to investigate the seasonal effects in stock market.

The returns in stock market (Rt) is calculated as the first differneces in the natural logarithms of the stock market logarithms of the stock marekt Indexes.

$Rt = \ln (Pt/Pt-1) * 100$.....i)

Where Rt is return period of time t, Pt is the daily closing price Index of the Nepal Stock Exchange.

3.4.1 GARCH (1,1) model

Empirical studies on this phenomenon suggest that the assumption of homoscedasticity is normally violated in the context of financial time series. The OLS

model can have ARCH effect so GARCH model is preferred over OLS. GARCH (1,1) can give enhanced results if there is data clustering. So GARCH(1,1) has been used in this study.

To examine the day of the week effect, the dummy variables for examining the weekend effect such as Ds, Dm, Dtu, Dw, Dth for Sunday, Monday, Tuesday, Wednesday and Thursday respectively are used. The dummy variable reflects a value of unity for a given day and value of zero for all remaining days. However, to make sure not to fall on dummy variable trap, constant was removed during GARCH (1,1) analysis. The reason is avoiding multicollinearity. $\alpha 1$, $\alpha 2$, $\alpha 3$, $\alpha 4$, $\alpha 5$ represent he coefficients of each dummy variable. ϵt represents the error term, the model established for examining week day effect as following

$Rt = \alpha 1\text{Ds} + \alpha 2\text{Dm} + \alpha 3\text{Dtu} + \alpha 4\text{Dw} + \alpha 5\text{Dth} + \epsilon t$.....ii)

Similarly, the month-of-the-year anomaly is examined through dummy variables. The model consists the dummy variables DBa, DJe, DAs, DSh, DBh, DAsh, DKa, DMa, DPo, DMag, DFa and DCh for the months of the Bikram calendar Baiskh, Jestha, Ashad, Shrawan, Bhadra, Ashwin, Kartik, Mangshir, Poush, Magh, Falgun and Chaitra respectively. Dummy variable taking the unitary value for the month otherwise it is considered zero. $\alpha 1$ signifies coefficient for Baisakh and, $\alpha 2$ to $\alpha 12$ represent coefficients for remaining months of the year. ϵt represents the error term.

The model is presented below

$Rt = \alpha 1D\text{Ba} + \alpha 2D\text{Je} + \alpha 3D\text{As} + \alpha 4D\text{Sh} + \alpha 5D\text{Bh} + \alpha 6D\text{Ash} + \alpha 7D\text{Ka} + \alpha 8Da\text{Ma} +$

$\alpha 9D\text{Po} + \alpha 10D\text{Mag} + \alpha 11D\text{Fa} + \alpha 12D\text{Ch} + \epsilon t$.....(iii)

To examine the holiday's effect the major festival of Dashain is taken for the study. This study comprises pre and post holidays effect separately for the sample period. The following measurement of the model is derived to evaluate the influence of holiday on stock Index returns.

$Rt = \alpha 1Dpre + \alpha 2Dpost + \alpha 3Dother + \epsilon t$.....(iv)

In the above model, $Dpre$ characterize the return on the day before the holiday and likewise $Dpost$ is the return on the following trading day after the holiday and Dother is the return on rest of the days. ϵt is the error term.

This study has used of M.S. Excel and E-Views 9 software for analysis of data.

CHAPTER IV

RESULTS

This chapter involves the empirical validation of the theories related with the calendar anomalies in the context of Nepalese capital market. This study was centered in identification of day-of-the-week effect, month-of-the-year effect, holiday effect (Dashain Effect) in NEPSE. Initially, the data set is ensured to be stationary and further data clustering is checked. In the presence of Data clustering, GARCH (1,1) model is used for analysis. Then, month-of-the-year, and holiday effects are examined. This study is based on NEPSE Index from the period of July 16, 2003 (Shrawan, 2060) to July 15, 2019(Ashad, 2076), Sensitive Index from September 12, 2009 (Bhadra, 2063) to July 15, 2019 (Ashad 2076).

4.1 Analysis of data

The secondary data were collected from the official website of NEPSE comprising NEPSE Index from Mid-July 2003 to Mid July 2019 and Sensitive Index from September 2009 to Mid-July 2019. The analysis of the data is presented subsequently.

4.1.1 Unit root test for NEPSE Index and Sensitive Index

Unit root test is conducted to identify whether the data is stationary or not. It was carried out by Groenewold and Kang (1993) and Dangol (2010) to test the random walk behavior of the stock prices. If the data is non-stationary, the technical analysis does not provide an opportunity for the investor to attain abnormal returns. Unit root test is carried out to identify if the data is stationary or not. In the presence of unit root, the data is not stationary. The results show that the daily log percentage returns does not have a unit root and hence the data are stationary.

Unit root test is carried by using constant and no trend, constant and trend and no constant and no trend ADF (Augmented Dickey-Fuller) test statistic for the null hypothesis H_0 = the data has unit root.

Table 4.1 Augmented Dickey Fuller (ADF) test

	Constant and No Trend		**Constant and Trend**		**No Constant and No Trend**	
	Augmented Dickey- Fuller test statistic	p-value	Augmented Dickey- Fuller test statistic	p-value	Augmented Dickey-Fuller test statistic	p-value
NEPSE Index	-39.5289	0.0000*	-39.6052	0.0000*	-39.4790	0.0000*
Sensitive Index	-32.1178	0.0000*	-32.1333	0.0000*	-32.0612	0.0000*

**Significant at 1 percent level of significance*

The Table 4.1 represents the ADF (Augmented Dickey-Fuller) value of NEPSE Index and Sensitive Index and the probability values. Since, the probability value in all types of test (constant and no trend, constant and trend and no constant and no trend) is less than the level of significance, the null hypothesis H_0 is rejected and hence NEPSE Index return and Sensitive Index return does not have a unit root and hence the data is stationary. This indicates that the data is stationary and hence there does not follow random walk and hence technical analysis can be useful to formulate investment strategy to gain abnormal return from NEPSE.

4.1.2 Test for data clustering

Volatility clustering is essential to be identified before using GARCH (1,1) model. In the presence of volatility clustering in the data, GARCH (1,1) model is used. It was used by Kiymaz and Berument, (2003), Ullah, Ullah, and Ali, (2015), Gao and Kling (2005) and Rahman and Amin (2011) to study the calendar anomalies. In particular, the plots in Figure 1 and Figure 2 show evidence of volatility clustering - low values of volatility followed by low values and high values of volatility followed by high values.

Figure 1 presents the daily movement of NEPSE Index for the sample period and it indicates presence of volatility clustering that changes over time.

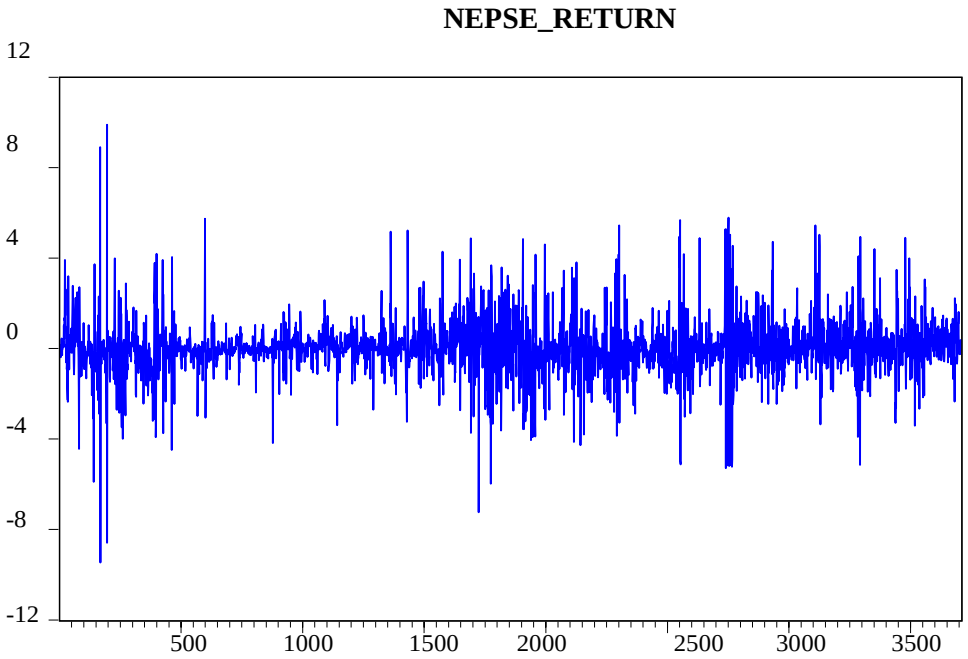

Figure 1: Movement of NEPSE Index during July 16, 2003(Shrawan, 2060) - July 15, 2019
(Ashad, 2076)

Figure 2 presents the daily movement of Sensitive Index for the sample period and it indicates presence of volatility clustering that changes over time.

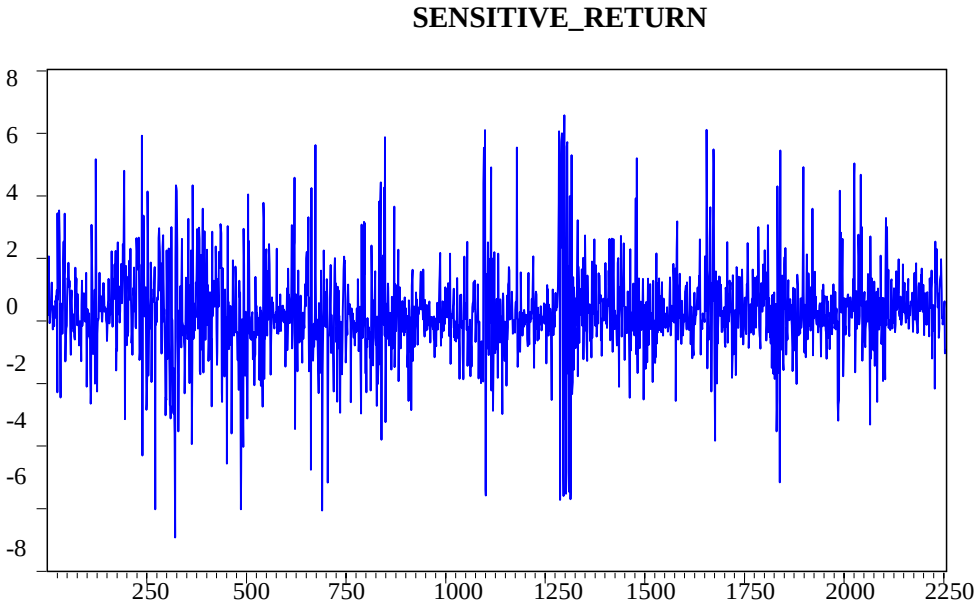

Figure 2: Movement of Sensitive Index during September 12 (Bhadra, 2066) – July 15, 2019 (Ashad, 2076)

4.1.3 Day-of-the-week effect

Day-of-the-week effect exits if the return in at least one trading day is significantly different from the average returns. In this study, day-of-the-week effect is investigated for the whole period from July 16, 2003 (Shrawan, 2060) to July 15, 2019 (Ashad, 2076) as per the Bikram Calendar; also by splitting data into two segments; from one bull to another; from one bear to another during the sample period. In the sample data bullish trend is observed four times and hence the day-of-week effect are investigated from 1st bull to 2nd bull, 2nd bull to 3rd bull and 3rd bull to 4th bull. Similarly the bearish trend is observed three times and hence the day-of-the-week effect is investigated from 1st bear to 2nd bear and 2nd bear to 3rd bear. Data are split to identify the calendar anomalies in sub-periods because short term situational factors affect the behavior of investors. For instance, most investors are optimistic during the bullish period whereas most investors are pessimistic during the bear. Splitting the data on the basis of bull and bear may help to identify the situation specific anomalies. Running from bull to bear may show one type of anomalies and running from bear to bull may give other anomalies. Thus, the data are split on Bull to Bull and Bear to Bear basis. The samples involve the return on NEPSE Index as well as return on Sensitive Index.

4.1.3.1 For NEPSE Index

This study has incorporated Arithmetic Mean and Standard Deviation as the descriptive statistics. The identification of such descriptive statistics helps to know the stock average returns and volatility of the stock returns during the different time periods. This segment consists the investigation of day-of-the-week anomalies in NEPSE Index during entire period and by splitting the data into two halves and also from bull to bull and bear to bear.

Day-of-the-week effect in NEPSE Index for entire data set and by splitting data into two halves

The entire period of NEPSE Index comprises a data from Shrawan 2060 to Ashad 2076. The data is split into two segments comprising 1st half from Shrawan 2060 to Ashad 2068 and from Shrawan 2068 to Ashad 2076.

Table 4.2 Descriptive statistics for NEPSE Index during entire period, first half and second half

	Sunday (Ds)	**Monday (Dm)**	**Tuesday (Dtu)**	**Wednesday (Dw)**	**Thursday (Dth)**
Entire period (mean and standard deviation, in percent)					
Mean	0.0025	0.0003	-0.0013	0.0080	0.0276
Standard Deviation	0.5482	0.5617	0.5386	0.5200	0.4678
Count	516	755	731	736	745
1st half					
Mean	0.0180	0.0161	-0.0018	-0.0047	0.0140
Standard Deviation	0.3970	0.5335	0.5228	0.4759	0.4595
Count	152	379	370	377	374
2nd half					
Mean	-0.0134	-0.0159	-0.0008	0.0210	0.0415
Standard Deviation	0.6681	0.5888	0.5545	0.5613	0.4759
Count	364	376	361	359	371

*significant at 5 percent level of significance
**significant at 1 percent level of significance

Table 4.2 exhibits that for the entire NEPSE data the highest mean return is found on Thursday (0.0276 percent) and the lowest (-0.0013 percent) mean return on Tuesday over the entire sample period. Monday returns have highest (0.5617 percent) volatility whereas Thursday returns have lowest (0.4678 percent) volatility.

During the first half, mean return on Sunday, Monday and Thursday are positive whereas the return on Tuesday and Wednesday are negative. The mean return for Sunday is highest (0.0180 percent) with the lowest volatility (0.3970 percent) over the period. Whereas the mean return for Wednesday is lowest (-0.0047 percent). There is highest volatility on mean return on Monday (0.5335 percent).

During the second half, mean returns for Sunday, Monday and Tuesday are negative whereas the mean returns for Wednesday and Thursday are positive. Thursday has provided highest mean return (0.04146 percent) with lowest volatility (0.47590 percent) for the period which was also observed in the entire data set. Whereas, there is lowest return (-0.01589 percent) on Monday for the 2nd half. There is highest volatility (0.66814 percent) of return on Sunday.

In sum, the entire period and the second half have highest mean returns on the same day (i.e. Thursday) whereas, lowest mean returns in different days of the week. The entire sample and the second half have the lowest volatility in the same day i.e. Thursday. Whereas, the entire period and the first half have the lowest volatility on the same day i.e. Monday. To find out if the returns in any day is significant GARCH (1,1) model is used.

Table 4.3 exhibits that for entire NEPSE data set, significantly positive return at 1 percent level of significance is detected on Thursday for the entire sample period. This accepts the hypothesis H_1. This shows that the mean return on Thursday is significantly positive and higher than other days of the week.

Table 4.3 GARCH (1,1) return equation results of NEPSE Index for entire data, first half and second half

Days/period	Coefficient	Std. Error	z-Statistic	Prob.
Entire period				
Sunday (Ds)	-0.0234	0.0245	-0.9545	0.3398
Monday (Dm)	-0.0288	0.0215	-1.3425	0.1794
Tuesday (Dtu)	-0.0221	0.0250	-0.8850	0.3762
Wednesday (Dw)	-0.0196	0.0247	-0.7942	0.4271
Thursday (Dth)	0.0823	0.0232	3.5454	0.0004**
1st half				
Sunday (Ds)	0.1513	0.0470	3.2173	0.0013**
Monday (Dm)	0.0035	0.0323	0.1083	0.9138
Tuesday (Dtu)	-0.0439	0.0327	-1.3406	0.1801
Wednesday (Dw)	-0.0762	0.0274	-2.7806	0.0054**
Thursday (Dth)	0.0421	0.0288	1.4658	0.1427
2nd half				
Sunday (Ds)	-0.0918	0.0410	-2.2386	0.0252*
Monday (Dm)	-0.0759	0.0400	-1.8968	0.0578
Tuesday (Dtu)	-0.0198	0.0467	-0.4248	0.6710
Wednesday (Dw)	0.0218	0.0516	0.4219	0.6731
Thursday (Dth)	0.1258	0.0491	2.5598	0.0105*

*significant at 5 percent level of significance

**significance at 1 percent level of significance

For the first half with the respective z-statistics and probabilities. It shows that the return on Sunday for the first half is significantly highest positive at 1 percent level of significance whereas the return on Wednesday is significantly lowest negative for the period. Hence, hypothesis H_1 is accepted. These findings does not overlap with the entire data set findings. For the second half, day-of-week effects are detected on Sunday and Thursday. There is significantly negative returns for the second half in Sunday whereas, the return on Thursday is significantly positive at 5 percent level of significance. Hypothesis H_1 is accepted. To summarize the findings, day-of-the-week effects were found in all the three periods. The mean return on Thursday is found

significant for the entire data set and the second half. However the first half has the different findings. The findings of first half and second half are contradicting. First half showed significantly highest return on Sunday and second half showed significantly lowest return on Sunday. This reflects the change in day-of-the- week anomaly. Significantly highest positive returns on Thursday were also found by Rahman (2009), Maharjan (2013) and Sharma (2015) however it contradicts with KC and Joshi (2005).

Day-of-the-week effect in NEPSE Index from bull to bull and bear to bear

Nepalese stock market has experienced the bullish trend for the four times during the sample period which is from July 16, 2003 (Shrawan, 2060) to July 15, 2019 (Ashad, 2076). In this study day-of-week effect is investigated from 1st Bull to 2nd Bull (i.e. from November 23, 2000 when NEPSE Index was 545.82 to Monday, December 17, 2007 when NEPSE Index hiked to 1064.09), 2nd Bull to 3rd Bull (i.e. Monday, December 17, 2007 when the Index was 1064.09 to Sunday, August 31, 2011 when the Index hiked to 1175.38), 3rd Bull to 4th Bull (i.e. Sunday, August 31, 2011 when the Index was 1175.38 to Wednesday, June 29, 2019 when the Index hiked to 1724.59). Also, day-of-the-week effect is investigated from 1st bear to 2nd bear (i.e. from Friday, March 15, 2005 when the index was 186.22 to Sunday, March 30, 2011 when the index was 702.97), 2nd bear to 3rd bear (i.e. from Sunday, March 30, 2011 when the index was 702.97 to Wednesday, June 15, 2014 when the index fell to 292.31). Every bull to bull period consists one bearish trend and one bullish trend. Whereas, every bear to bear period comprises one bullish trend and one bearish trend. The purpose of segmenting the data on the basis of bull to bull and bear to bear was to identify if the day-of-the-week anomalies remains consistent as the market moves from bull to bear and bear to bull.

Table 4.4 displays that during first bull to second bull the mean return on Wednesday is negative whereas, other days have positive mean returns. The mean return on Sunday is highest (0.0205 percent) with lowest volatility (0.3521 percent) for the period. Also, the mean return on Tuesday is lowest (0.0004 percent) for the period. There is highest volatility (0.5077 percent) on Monday return. This is akin to the findings during first half of the data.

Furthermore, during second bull to third bull, the descriptive statistics reflect that

mean return in Thursday are highest (0.0880 percent) whereas the mean return on Tuesday for the period are lowest (-0.0397 percent). From first bull to second bull also the lowest mean returns were observed on Tuesday. There is highest volatility (0.8667 percent) in Sunday where as lowest volatility (0.6446 percent) occurs on Wednesday in stock returns.

Furthermore, during third bull to fourth bull, negative mean returns are observed on Sunday, Monday and Tuesday where as positive returns occur on Wednesday and Thursday. The return on Thursday is the highest (0.039608 percent) whereas, the return on Monday is the lowest (-0.01721 percent). The volatility of Sunday return is the highest (0.671846 percent) whereas, the volatility for Thursday return is the lowest (0.469202 percent).

During first bear to second bear, there is highest (0.0218 percent) mean return on Thursday whereas lowest (0.0102 percent) mean return is seen on Wednesday. There is highest volatility (0.4524 percent) in mean return on Tuesday and lowest volatility (0.4099 percent) on Wednesday.

Furthermore, during second bear to third bear, the mean return on Sunday, Monday and Tuesday are negative and the mean return on Wednesday and Thursday are positive. There is highest (0.017 percent) on Thursday and lowest (-0.0639 percent) mean return on Monday. Also, there is highest volatility (0.6357 percent) in mean return on Sunday and lowest volatility (0.4952 percent) of mean return on Thursday.

Table 4.4 Descriptive statistics for NEPSE Index from bull to bull and bear to bear

	Sunday (Ds)	Monday (Dm)	Tuesday (Dtu)	Wednesday (Dw)	Thursday (Dth)
1st bull to 2nd bull					
Mean	0.0205	0.016	0.0004	-0.0073	0.0033
Standard Deviation	0.3521	0.5077	0.4862	0.4535	0.4324
Count	124	335	329	337	336
2nd bull to 3rd bull					
Mean	0.0187	-0.0157	-0.0397	0.0166	0.0880
Standard Deviation	0.8667	0.7075	0.8632	0.6446	0.7378
Count	34	33	32	32	31
3rd bull to 4th bull					
Mean	-0.0130	-0.0172	-0.0021	0.0177	0.0396
Standard Deviation	0.6718	0.5892	0.5518	0.5607	0.4692
Count	357	368	353	351	362
1st bear to 2nd bear					
Mean	0.0171	0.0185	0.018	0.0102	0.0218
Standard Deviation	0.4278	0.4271	0.4524	0.4099	0.4224
Count	138	287	278	286	286
2nd bear to 3rd bear					
Mean	-0.0464	-0.0639	-0.0393	0.0135	0.017
Standard Deviation	0.6357	0.5727	0.5848	0.5372	0.4952
Count	148	154	145	144	147

*significant at 5 percent level of significance

**significant at 1 percent level of significance

In summary, the different sub-periods formed on the basis of bull to bull does not provide a consistent pattern mean return and volatility. Also the sub-periods formed on the basis of bear to bear does not also provide consistent mean returns and volatility except consistent highest return on Thursday. However, from bull to bull and bear to bear, except during first bull to second bull, all the sub-periods haves shown highest mean return on Thursday but no consistent lowest mean returns. These findings are akin to the findings for day-of-the- week effect investigated for entire period and splitting the data in to two halves. The results of descriptive statistics are further tested with GARCH (1,1) model.

Table 4.5 GARCH (1,1) return equation results of NEPSE Index from bull to bull and bear to bear

Days/period	Coefficient	Std. Error	z-Statistic	Prob.
	1st bull to 2nd bull			
Sunday (Ds)	0.1543	0.0493	3.1288	0.0018**
Monday (Dm)	0.0008	0.0341	0.0237	0.9811
Tuesday (Dtu)	-0.0543	0.0333	-1.6296	0.1032
Wednesday (Dw)	-0.0814	0.0282	-2.8901	0.0039**
Thursday (Dth)	0.0297	0.0294	1.0097	0.3126
	2nd bull to 3rd bull			
Sunday (Ds)	0.0874	0.2234	0.3912	0.6956
Monday (Dm)	0.0531	0.2121	0.2503	0.8023
Tuesday (Dtu)	0.0634	0.2301	0.2756	0.7828
Wednesday (Dw)	0.1548	0.2588	0.5982	0.5497
Thursday (Dth)	0.4796	0.2538	1.8896	0.0588
	3rd bull to fourth bull			
Sunday (Ds)	-0.0915	0.0412	-2.2223	0.0263*
Monday (Dm)	-0.0719	0.0407	-1.7656	0.0775
Tuesday (Dtu)	-0.0210	0.0475	-0.4425	0.6581
Wednesday (Dw)	0.0158	0.0519	0.3047	0.7606
Thursday (Dth)	0.1200	0.0503	2.3878	0.0169*
	1st bear to 2nd bear			
Sunday (Ds)	0.1512	0.0458	3.3038	0.0010**
Monday (Dm)	0.0172	0.0386	0.4447	0.6565
Tuesday (Dtu)	-0.0246	0.0362	-0.6794	0.4969
Wednesday (Dw)	-0.0603	0.0269	-2.2372	0.0253*
Thursday (Dth)	0.0411	0.0294	1.3977	0.1622
	2nd bear to 3rd bear			
Sunday (Ds)	-0.2299	0.0701	-3.2777	0.0010**
Monday (Dm)	-0.2918	0.0766	-3.8088	0.0001**
Tuesday (Dtu)	-0.2325	0.0754	-3.0815	0.0021*
Wednesday (Dw)	-0.0571	0.0807	-0.7076	0.4792
Thursday (Dth)	0.0762	0.0736	1.0365	0.3000

*significant at 5 percent level of significance
**significant at 1 percent level of significance

Table 4.5 exhibits that from 1st Bull to 2nd Bull there is significantly lowest negative return on Wednesday. Whereas Sunday has significantly highest positive returns for the period. This proves the presence of day-of-the-week effect for the period. Hence hypothesis H1 is accepted. This indicates that during the period those investors who

had bought up securities on Wednesday and sold on Sunday would have been better off.

Furthermore, during 2nd bull to 3rd bull, shows that the return on none of the days of the week is statistically significant for the period. Hence, hypothesis H1 is rejected for this sub-period. However, the return on Thursday is the highest over the period. The coefficient for the Thursday is also the highest. Also, surprisingly all days coefficients are positive for the period. The time frame of this sub-period is of eight months only which is the lowest sub-period in the sample.

Furthermore, during 3rd bull to 4th bull, there is existence of day-of-the-week effect. Here the hypothesis H_1 is accepted. There is significantly positive highest return on Thursday at 5 percent level of significance which was also observed for the entire sample period and the period of 2nd half. Whereas, the return on Sunday is negative and significantly lowest at 5 percent level of significance.

Similarly, during 1st bear to 2nd bear, the mean return on Sunday is significantly positive highest at 1 percent level of significance and the mean return on Wednesday is significantly lowest negative at 5 percent level of significance. This shows the existence of day-of-the- week effect during this sub-period. This accepts the hypothesis H_1.

However, some different findings can be noticed in table 4.5 during 2nd bear to 3rd bear. During this time frame significantly negative returns are seen during Sunday, Monday and Tuesday. This accepts the hypothesis H_1. The return on Sunday and Monday are significant at 1 percent level of significance whereas the return on Tuesday are significant at 5 percent level of significance.

To summarize the findings, there is existence of day-of-the-week effect during all the sub- periods except during 2nd bull to 3rd bull. The findings are not consistent in all the sub- periods. The day-of-the-week effect is observed on the same days during 1st bull to 2nd bull and 1st bear to 2nd bear (i.e. significantly higher return on Sunday and significantly lower return on Wednesday) which were also observed during 1st half the entire NEPSE data. During 3rd bull to 4th bull, significantly positive return is observed on Thursday which is akin to the findings in entire data set and the second half. Neither, the bull to bull anomalies are consistent not the bear to bear anomalies are consistent in this case. So, it can be conferred that during different sub-periods,

investors are behaving differently and day-of- the-week anomaly has changed from significantly higher return on Sunday during 1st half period to significantly highest return on Thursday during the 2nd half period.

4.1.3.2 For Sensitive Index

Day-of-the-week effect is also investigated for the NEPSE Sensitive Index. The sensitive Index is the market indicator for the 'A' grade companies listed in NEPSE. Some investors regard those companies as Blue-chip companies of NEPSE. This section comprises the study of day-of-the-week effect in Sensitive Index of NEPSE. Firstly, it involves the investigation of the effect for the entire period and by splitting the data in two halves. Secondly, it involves the investigation of the day-of-the-week effect by identifying the bull and bear points.

The Day-of-the-week effect in Sensitive Index for entire data set and by splitting data into two halves

The entire period of NEPSE Index comprises a data from 28 Bhadra, 2066 to 31 Ashad, 2076. The data is split into two segments comprising 1st half from 28 Bhadra, 2066 to 19 Shrawan 2071 and the second half comprises data from 19 Shrawan 2071 to 31 Ashad, 2076.

Table 4.6 reflects that for the entire period, the mean return on Sunday, Monday and Tuesday is negative for whereas the mean returns for Wednesday and Thursday were positive. Highest mean return (0.0583 percent) can be observed on Thursday which was also found in the entire sample study of NEPSE Index whereas lowest mean return (-0.0128 percent) can be observed in Monday. There is highest volatility (0.7211 percent) of return in Sunday and the lowest volatility (0.5499 percent) in Thursday. Lowest volatility was also observed in Thursday in the entire sample study of NEPSE Index.

Similarly, during 1st half period, mean return on Thursday is the highest (0.0571 percent) whereas the mean return on Monday is the lowest (-0.0128 percent) for the period. Whereas there is highest volatility (0.7555 percent) of return on Sunday whereas lowest volatility (0.6140 percent) of return on Wednesday. This does not match with the findings on first half of the NEPSE Index.

Table 4.6 Descriptive statistics for Sensitive Index during entire period, first half and second half for day-of-the-week effect

	Sunday (Ds)	**Monday (Dm)**	**Tuesday (Dtu)**	**Wednesday (Dw)**	**Thursday (Dth)**
Entire period					
Mean	-0.0044	-0.0128	-0.0011	0.0186	0.0583
Standard Deviation	0.7211	0.6392	0.6181	0.6162	0.5499
Count	450	462	439	443	457
1st half					
Mean	-0.0217	-0.0473	-0.0163	0.0177	0.0571
Standard Deviation	0.7555	0.6646	0.6629	0.6140	0.6232
Count	226	234	215	222	228
2nd half					
Mean	0.0128	0.0217	0.0141	0.0200	0.0596
Standard Deviation	0.6853	0.6114	0.5702	0.6188	0.4660
Count	224	228	224	221	229

*significant at 5 percent level of significance

**significant at 1 percent level of significance

Similarly, during the 2nd half, mean return for Thursday is the highest (0.0596 percent) as in the 2nd half of the NEPSE Index whereas the mean return on Sunday is lowest (0.0128 percent). There highest volatility (0.6853 percent) in mean return on Sunday as in the 2nd half of the NEPSE Index whereas lowest volatility (0.4660 percent) is found on Thursday as in the 2nd half of the NEPSE Index. Comparing the results with 1st half of the Sensitive Index return, highest mean return was observed in the same day whereas highest standard deviation was also observed in the same day.

In sum, the descriptive statistics show that there is highest mean return observed on Thursday during all the sub-periods of Sensitive Index. However, the lowest return, highest and lowest volatility is not consistent throughout all the sub-periods. GARCH (1,1) model is further used for identifying if the returns are significant or not.

Table 4.7 GARCH (1,1) return equation results of Sensitive Index for entire data, first half and second half

Days/period	Coefficient	Std. Error	z-Statistic	Prob.
Entire period				
Sunday (Ds)	-0.0393	0.0382	-1.0311	0.3025
Monday (Dm)	-0.0744	0.0378	-1.9695	0.0489**
Tuesday (Dtu)	0.0193	0.0469	0.4112	0.6809
Wednesday (Dw)	0.0262	0.0500	0.5245	0.5999
Thursday (Dth)	0.1750	0.0434	4.0314	0.0001*
1st half				
Sunday (Ds)	-0.1007	0.0640	-1.5745	0.1154
Monday (Dm)	-0.2127	0.0623	-3.4134	0.0006*
Tuesday (Dtu)	-0.0794	0.0687	-1.1558	0.2478
Wednesday (Dw)	-0.0037	0.0789	-0.0472	0.9624
Thursday (Dth)	0.1858	0.0724	2.5654	0.0103**
2nd half				
Sunday (Ds)	-0.0046	0.0555	-0.0830	0.9339
Monday (Dm)	0.0117	0.0524	0.2225	0.8239
Tuesday (Dtu)	0.0709	0.0702	1.0094	0.3128
Wednesday (Dw)	0.0507	0.0716	0.7081	0.4789
Thursday (Dth)	0.1734	0.0638	2.7181	0.0066*

*significant at 5 percent level of significance

**significant at 1 percent level of significance

Table 4.7 exhibits that during the entire period, the return on Monday is significantly negative at 5 percent level of significance whereas the return on Thursday is significant at 1 percent level of significance. Hence, hypothesis H_2 is accepted. This indicates the presence of day-of-the-week anomaly in the Sensitive Index. Thursday returns for the entire sample period were also observed significant for the NEPSE Index.

Furthermore, during the 1st half, mean return is Monday is significant at 1 percent level of significance whereas the mean return on Thursday is significant at 5 percent level of significance. This accepts the hypothesis H2 which means that the mean return in at least one day of the week is significant. It indicates the presence of day of the week anomaly. These results are different from the result of first half of the NEPSE Index.

Similarly, during the 2nd half, mean return on Thursday is significantly higher than other days of the week at 1 percent level of significance. Hence hypothesis H_1 is accepted. This indicates the presence of day-of-the-week effect during the period in the Sensitive Index. This result is akin to the findings on NEPSE Index in the 2nd half and the 1st half of the Sensitive Index.

To summarize the findings, significantly higher return is observed on Thursday for the entire period and sub-periods of the Sensitive Index. During the entire period and the 1st half of the Sensitive Index, significantly lower return is also observed. These findings indicate the day-of-the-week effect prevails in the Sensitive Index. Such effect is persistent, so these findings can be more accurately incorporated in the investment strategy to gain abnormal returns by the investors.

Day-of-the-week effect in Sensitive Index from one bull to another and from one bear to another

This part consists the investigation of day-of-the-week effect in Sensitive Index by undertaking different bull and bear points. Since, NEPSE has Sensitive Index formation lately, so the day-of-the-week effect during the first bull to second bull time and 1st bear to 2nd bear could not be studied. This study consist the identification of day-of-the-week effect from 2nd Bull to 3rd Bull (i.e. Monday, December 17, 2010 when the NEPSE Index was 1064.09 to Sunday, August 31, 2011 when the NEPSE Index hiked to 1175.38), 3rd Bull to 4th Bull (i.e. Sunday, August 31, 2011 when the NEPSE Index was 1175.38 to Wednesday, June 29, 2019 when the NEPSE Index hiked to 1724.59). Also, day-of-the-week effect is investigated from 2nd bear to 3rd bear (i.e. from Sunday, March 30, 2011 when the NEPSE index was 702.97 to Wednesday, June 15, 2014 when the index fell to 292.31).

Table 4.8 Descriptive statistics for Sensitive Index from bull to bull and bear to bear

	Sunday (Ds)	**Monday (Dm)**	**Tuesday (Dtu)**	**Wednesday (Dw)**	**Thursday (Dth)**
2nd bull to 3rd bull					
Mean	0.0011	-0.0289	-0.0528	-0.0029	0.0880
Standard Deviation	0.8715	0.7829	0.9671	0.7780	0.7795
Count	34	33	32	32	31
3rd bull to 4th bull					
Mean	-0.0192	-0.0200	-0.0040	0.0191	0.0416
Standard Deviation	0.7043	0.6393	0.6003	0.6024	0.5012
Count	357	368	353	351	362
2nd bear to 3rd bear					
Mean	-0.0602	-0.0647	-0.0562	0.0047	0.0052
Standard Deviation	0.5944	0.5046	0.6415	0.5559	0.4702
Count	148	154	145	144	147

*significant at 5 percent level of significance

**significant at 1 percent level of significance

Table 4.8 exhibits that during 2nd bull to 3rd bull, the mean return on Sunday and Thursday are positive whereas mean returns on Monday Tuesday and Wednesday are negative. The mean return on Thursday is the highest (0.0880 percent) positive whereas the mean return on Tuesday is the lowest (-0.0528 percent) negative. There is highest volatility (0.9671 percent) of return on Tuesday whereas lowest volatility (0.7780 percent) of return has occurred on Wednesday. Highest mean return was also observed in Thursday during 2nd bull to 3rd bull and also the lowest mean return was also observed during Tuesday during 2nd bull to 3rd bull. However, highest volatility was observed during Sunday but the lowest volatility was also observed on Wednesday only.

Similarly, during 3rd bull to 4th bull, Sunday, Monday and Tuesday have negative mean returns whereas Wednesday and Thursday have the positive mean returns. Thursday has the highest (0.0416 percent) mean return and also lowest (0.5012 percent) volatility. Whereas Monday has the lowest (-0.0199 percent) mean return and Sunday has the highest (0.7043 percent) volatility. The findings from NEPSE Index

were also the same as these. Similarly, during 2nd bear to 3rd bear also the mean return on Sunday, Monday and Tuesday are negative. There is highest (0.0052 percent) mean return on Thursday and lowest (- 0.0647 percent) mean return on Monday. Highest (0.6415 percent) volatility can be observed on Tuesday and lowest (0.4702 percent) volatility can be observed on Thursday. These findings are similar to the findings in NEPSE Index. GARCH (1, 1) model is used for further identification of day-of-the-week effect in respective days.

Table 4.9 shows that during 2nd bull to 3rd bull none of the days of the week have significant return. Thursday has the highest insignificant coefficient of return than any other days of the week and Monday has the lowest insignificant coefficient. Hence, hypothesis H_1 is rejected. These findings are similar to the findings of NEPSE Index in this study during 2nd bull to 3rd bull. This means that there is no day-of-the-week effect in the Sensitive Index during the period.

However, during 3rd bull to 4th bull, there is existence of day-of-the-week effect. Hence, hypothesis H_1 is accepted. The return on Thursday is significantly positive and highest at 5 percent level of significance. The return on Monday is insignificantly lowest. In case of NEPSE Index also Thursday return were found significant. This indicates that Thursday returns has outperformed the other days' returns.

Also watching, the GARCH (1, 1) findings in bear to bear period, during 2nd bear to 3rd bear, the returns on Sunday, Monday and Tuesday are seen significantly negative. The mean return on Sunday and Monday are significant at 1 percent level of significance whereas the mean return on Tuesday are significantly negative at 5 percent level of significance. This accepts the hypothesis H_1. This indicates that there exist day-of-the-week effect during the period. Insignificantly highest return can be observed on Wednesday during the period. These findings are akin to the findings in NEPSE Index during the same period.

In sum, day-of-the-week effect is identified in two sub periods: 3rd bull to 4th bull and 2nd bear to third bear for sensitive index. However, no day-of-the-week anomaly is visible during 2nd bull to 3rd bull period. These findings are similar to the findings of the NEPSE Index. Which means that the anomalies in NEPSE Index and Sensitive Index are not necessarily different at least for these sub-periods.

Table 4.9 GARCH (1,1) return equation results of Sensitive Index from bull to bull and bear to bear

Days/period	Coefficient	Std. Error	z-Statistic	Prob.
2nd bull to 3rd bull				
Sunday (Ds)	0.1036	0.2353	0.4401	0.6599
Monday (Dm)	0.0664	0.2260	0.2936	0.7690
Tuesday (Dtu)	0.1765	0.2069	0.8531	0.3936
Wednesday (Dw)	0.1065	0.2771	0.3844	0.7007
Thursday (Dth)	0.4612	0.3116	1.4800	0.1389
3rd bull to 4th bull				
Sunday (Ds)	-0.0831	0.0426	-1.9512	0.0510
Monday (Dm)	-0.0880	0.0453	-1.9431	0.0520
Tuesday (Dtu)	-0.0413	0.0559	-0.7393	0.4597
Wednesday (Dw)	0.0380	0.0590	0.6433	0.5200
Thursday (Dth)	0.1297	0.0572	2.2666	0.0234**
2nd bear to 3rd bear				
Sunday (Ds)	-0.2624	0.0858	-3.0573	0.0022**
Monday (Dm)	-0.3655	0.0923	-3.9601	0.0001**
Tuesday (Dtu)	-0.2266	0.0881	-2.5732	0.0101*
Wednesday (Dw)	-0.0149	0.0984	-0.1517	0.8794
Thursday (Dth)	0.0854	0.1089	0.7839	0.4331

*significant at 5 percent level of significance

**significant at 1 percent level of significance

To summarize the overall findings of day-of-the-week effect it is revealed significantly positive returns are observed during entire period and most-periods on Thursday in both NEPSE Index as well as Sensitive Index. The results show that there was highest significant return on Sunday during the first half of NEPSE Index, during 1st bull to 2nd bull and 1st bear to 2nd bear of the NEPSE Index. The periods, 1st bull to 2nd bull and 1st bear to 2nd bear lies during the first half of NEPSE Index. Thus, it can be inferred that the day-of-the-week anomaly which reflected significantly highest return on Sunday during 1st half (i.e. from Shrawan 2060 to Ashad 2067) to Thursday during 2nd half (i.e. from Shrawan 2067 to Ashad 2076). For Sensitive Index, day-of-the-week anomaly is observed consistently on Thursday during entire period, first half and second half. So, it can be said that day of the week anomaly is persistent on Thursday which contradict with KC and Joshi (2005) but are similar to Rahman (2009), Maharjan (2013) and Sharma (2015). But the analysis provided no having

significantly lowest negative return.

4.1.4 Month-of-the-year effect

The month-of-the-year effect exists when some months of the year provide abnormal return than the average return in all the months. For studying the month-of-the-year effect, in this study, firstly entire data set from Shrawan 2060 to Ashad 2076 is analyzed and secondly, entire data is split in two halves (each consisting 8 years) and analyzed. The data is segmented in to two halves in order to identify if the anomalies persist in all the segments or not. The descriptive statistics and GARCH (1,1) models is used for identification of Month-of-the-year anomaly. Month-of-the-year effect are investigated in NEPSE Index as well as Sensitive Index.

4.1.4.1 Month-of-the-year effect in NEPSE Index

The log return on NEPSE Index for every months of Bikram Calendar are analyzed in this section. It involves the descriptive statistics comprising mean and standard deviation which measure average return and volatility in return respectively. Furthermore, it comprises the GARCH (1,1) analysis to identify the month of the year effect.

Table 4.10 shows that during the entire period, the mean return in Bhadra, Poush, Magh and Falgun are negative and the mean returns in rest are positive. This indicates that the return in the months of Bhadra, Poush, Magh and Falgun are dominated by other months of the year. Mean return on Ashad is highest (0.4928 percent) and mean return on Jestha is the lowest (-0.2192 percent). Furthermore, the volatility of return in Bhadra is highest (2.7833 percent) whereas the volatility of return in Ashwin is the lowest (1.1267 percent).

Table 4.10 Descriptive statistics for Month-of-the-year effect in NEPSE Index

Period	Entire Period		1st Half		2nd Half	
Months	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Baisakh (*D*Ba)	0.2459	2.2273	0.2784	1.9838	0.2159	2.4675
Jestha (*D*Je)	0.0652	2.1292	0.1359	2.1695	-0.0048	2.1084
Ashad (*D*As)	0.4928	2.4016	0.3063	1.9285	0.6845	2.8040
Shrawan(*D*Sh)	0.1852	1.9045	0.154	1.1165	0.0947	2.1536
Bhadra (*D*Bh)	-0.2141	2.7833	0.0058	3.0278	-0.4363	2.5279
Ashwin (*D*Ash)	0.0722	1.1267	0.1861	1.0874	-0.041	1.1649
Kartik (*D*Ka)	0.1516	2.3313	0.4795	2.3427	-0.1748	2.2977
Mangshir (*D*Ma)	0.1134	2.2587	0.0855	1.9913	0.1424	2.5186
Poush (*D*Po)	-0.0483	1.6789	-0.2165	1.6602	0.1194	1.6980
Magh (*D*Mag)	-0.0501	1.7534	-0.0906	2.1718	-0.01	1.2221
Falgun (*D*Fa)	-0.2192	2.3877	-0.4192	3.1958	-0.0216	1.1088
Chaitra (*D*Ch)	0.0181	1.4659	0.1257	1.6132	-0.0894	1.3104

*significant at 5 percent level of significance

**significant at 1 percent level of significance

Similarly, during the 1st half, highest (0.4795 percent) mean return is found in Kartik and lowest (-0.4192 percent) mean return is found in the month of Falgun. Furthermore, the highest volatility (3.1958 percent) in mean return is found in Falgun and lowest volatility (1.0874 percent) is observed in Ashwin. Lowest volatility is observed in the same month as entire data set for monthly return. Other findings are not alike the entire data set. This indicates that Kartik is the best month for selling of the holdings and Falgun is the best month to make investments for the period. Findings of this sub-period does not match with the entire data set.

Similarly, during the 2nd half, there is highest (0.6845 percent) positive return observed in Ashad and the lowest (-0.4363 percent) negative return in Bhadra. The highest positive return on Ashad is akin to the findings on whole data set. There is highest volatility (2.804 percent) in mean return observed in the month of Ashad and the lowest volatility (1.1088 percent) in Falgun. This indicates that investors are better off by selling investments in Ashad and selling in Bhadra.

To summarize the findings, the entire period and the 2nd sub-period revealed the highest mean return in Ashad whereas, lowest average return and highest volatilities and lowest volatilities are observed in the different months of the year during different sub-periods. To test the existence of the month-of-the-year effect further GARCH (1,1) analysis is carried.

Table 4.11 shows that for the entire period, the mean return on Ashad is significant at 1 percent level of significance. Here, the month of Ashad has significantly highest positive return than any other months of the year. Also, there is insignificantly lowest negative return in the month Bhadra. Since month-of-the-year effect is observed from the given table, hypothesis H_2 is accepted for the period. This indicates that the investor has possibility to attain abnormal return during the month of Ashad by using technical analysis. Similarly, during the 1st half period also, there is existence of month-of-the-year effect. As per the findings portrayed in the table, the returns in Shrawan, Bhadra, Ashwin, Kartik and Magh are significant. The return on Shrawan are significantly positive and highest at 1 percent level of significance whereas the return on Bhadra are significantly lowest negative. Hence, hypothesis H_2 is accepted. This indicates that Bhadra is the best month for the investors to make investment and Ashad is the best month to reap the benefits from the market. These findings does not match with the findings from the entire data set.

Similarly, during the 2nd half period, mean return in Ashad, Bhadra and Poush are significant. Hence, hypothesis H_3 is accepted. There is highest significantly positive return in Ashad at 1 percent level whereas there is significantly lowest negative return in Bhadra at 5 percent level of significance. Also, significantly positive return in observed during Poush. The highest significantly positive monthly return was also observed in the Ashad from the analysis of entire data set whereas in 1st half and second half has significantly negative return in the same month Bhadra. This indicates that Ashad is good month to sell and Bhadra is the good month to purchase the securities.

Table 4.11 GARCH (1,1) return equation results for Month-of-the-year effect for entire period, 1st half and 2nd half

	Months	Coefficient	Std. Error	z-Statistic	Prob.
Entire Period	Baisakh (*D*Ba)	3.1470	1.3498	2.3313	0.0197
	Jestha (*D*Je)	0.9102	1.4581	0.6243	0.5325
	Ashad (*D*As)	5.5649	1.8587	2.9940	0.0028**
	Shrawan(*D*Sh)	3.1733	1.6470	1.9267	0.0540
	Bhadra (*D*Bh)	-2.8666	1.5170	-1.8896	0.0588
	Ashwin (*D*Ash)	0.3167	3.1585	0.1003	0.9201
	Kartik (*D*Ka)	0.9945	1.5872	0.6265	0.5310
	Mangshir (*D*Ma)	2.0825	1.5071	1.3818	0.1670
	Poush (*D*Po)	0.1505	2.2356	0.0673	0.9463
	Magh (*D*Mag)	0.6500	1.8823	0.3453	0.7299
	Falgun (*D*Fa)	-0.8275	1.5857	-0.5219	0.6018
	Chaitra (*D*Ch)	0.2258	2.4675	0.0915	0.9271
1st Half	Baisakh (*D*Ba)	1.5436	2.1471	0.7189	0.4722
	Jestha (*D*Je)	4.1987	2.4383	1.7219	0.0851
	Ashad (*D*As)	4.1041	3.0629	1.3399	0.1803
	Shrawan(*D*Sh)	8.3432	0.9865	8.4576	0.0000**
	Bhadra (*D*Bh)	-2.7750	0.1390	-19.9696	0.0000**
	Ashwin (*D*Ash)	-1.1482	0.1995	-5.7557	0.0000**
	Kartik (*D*Ka)	2.0875	0.3077	6.7833	0.0000**
	Mangshir (*D*Ma)	-0.4032	0.4644	-0.8681	0.3853
	Poush (*D*Po)	-0.8320	0.7164	-1.1615	0.2455
	Magh (*D*Mag)	1.5809	0.6808	2.3219	0.0202*
	Falgun (*D*Fa)	-1.3714	2.0484	-0.6695	0.5032
	Chaitra (*D*Ch)	-3.0718	2.0159	-1.5238	0.1276
2nd Half	Baisakh (*D*Ba)	2.4285	2.3195	1.0470	0.2951
	Jestha (*D*Je)	-0.0624	2.0408	-0.0306	0.9756
	Ashad (*D*As)	8.1224	2.2898	3.5473	0.0004**
	Shrawan(*D*Sh)	1.0838	2.7656	0.3919	0.6951
	Bhadra (*D*Bh)	-4.1426	1.6670	-2.4850	0.013*
	Ashwin (*D*Ash)	0.0857	2.6662	0.0321	0.9744
	Kartik (*D*Ka)	-1.1909	2.1803	-0.5462	0.5849
	Mangshir (*D*Ma)	1.2358	2.4492	0.5046	0.6139
	Poush (*D*Po)	6.2756	0.8266	7.5919	0.0000**
	Magh (*D*Mag)	0.3444	2.4462	0.1408	0.888
	Falgun (*D*Fa)	-0.4568	2.7149	-0.1683	0.8664
	Chaitra (*D*Ch)	-0.3775	2.1612	-0.1747	0.8613

*significant at 5 percent level of significance

**significant 1 percent level of significance

In summary, month-of-the-year effect is observed in the NEPSE. There is significantly highest return during the month of Ashad during the entire period and the 2nd half period whereas there is significantly highest return in Shrawan during the 1st half. Significantly lowest negative return is observed in Bhadra during 1st half and 2nd half however insignificantly lowest return is observed during the month of Bhadra during the entire period. To sum up the findings month-of-the-year effect can be seen in Ashad and Bhadra in NEPSE Index return.

4.1.4.2 Month-of-the-year effect in Sensitive Index

Sensitive Index started from September 2019, so for the purpose of entire period month- of-the-year anomaly identification, Sensitive Index return from October 2019 to Mid July 2019 are undertaken. For analysis of Month-of-the-year effect, initially whole Sensitive Index log return is analyzed and later the data is divided into two equal halves and analyzed. First half of data comprises the Sensitive Index returns from 27 Bhadra 2066 to Jestha 2071. Second half comprises the data from Ashad 2071 to Ashad 2076 BS. The following table shows the descriptive statistics.

Table 4.12 exhibits the Sensitive Index mean monthly returns and standard deviation for the entire period 1st half and 2nd half. During entire period, mean return during the months of Baisakh, Jestha, Bhadra, Ashwin, Kartik and Falgun are negative where rest of the months have positive returns. There is highest (0.1187 percent) positive return during the month of Ashad as in the case of NEPSE Index return for entire period whereas lowest (- 0.0399 percent) negative return is found in Jestha which is also observed in the case of NEPSE Index return for the entire period. There is highest volatility (0.6049 percent) of return in the months of Baisakh whereas lowest volatility (0.1584 percent) of return in the months of Ashwin. Lowest volatility is observed during Ashwin in case of NEPSE Index return also.

Table 4.12 Descriptive statistics for Month-of-the-year effect in Sensitive Index

Entire Period			1st Half		2nd Half	
Months	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Baisakh (*D*Ba)	-0.0253	0.6049	0.0583	0.4103	-0.1066	0.7454
Jestha (*D*Je)	-0.0399	0.2980	-0.0946	0.3970	0.0124	0.1400
Ashad (*D*As)	0.1187	0.5877	0.0901	0.7048	0.1173	0.3985
Shrawan(*D*Sh)	0.0426	0.4682	-0.0140	0.1861	0.0979	0.6313
Bhadra (*D*Bh)	-0.0108	0.2149	-0.0261	0.1400	0.0038	0.2701
Ashwin (*D*Ash)	-0.0067	0.1584	-0.0289	0.1841	0.0146	0.1284
Kartik (*D*Ka)	-0.0151	0.2777	-0.0094	0.3109	-0.0209	0.2465
Mangshir (*D*Ma)	0.0511	0.3727	0.0460	0.3747	0.0569	0.3769
Poush (*D*Po)	0.0137	0.2335	-0.0104	0.3041	0.0372	0.1363
Magh (*D*Mag)	0.0475	0.3298	0.0905	0.4671	0.0068	0.0562
Falgun (*D*Fa)	-0.0302	0.2333	-0.0800	0.2830	0.0174	0.1636
Chaitra (*D*Ch)	0.0666	0.5309	0.0509	0.5844	0.0829	0.4829

*significant at 5 percent level of significance

**significant at 1 percent level of significance

Similarly, during 1st half, the mean return in Jestha, Shrawan, Bhadra, Ashwin, Kartik, Poush and Falgun are negative and mean monthly return on the rest months are positive. The mean monthly return for the month of Magh is highest (0.0905 percent) whereas the mean monthly return for the month of Jestha is the lowest (-0.0946 percent). Lowest mean return was also observed in the month of Jestha in the entire data set of NEPSE Index returns also. Furthermore, there is highest volatility (0.7048 percent) in the mean return in the month of Ashad whereas lowest volatility (0.1400 percent) can be observed in the month of Bhadra.

Similarly, during the 2nd half, the mean monthly return in Baisakh and Kartik are negative where rest of the months have positive returns. Highest (0.1173 percent) mean return can be observed in the months of Ashad whereas lowest (-0.1066 percent) mean monthly return can be observed in the months of Baisakh. Highest volatility (0.7454 percent) can also be observed in the month of Baisakh whereas lowest return volatility (0.0562 percent) can be observed in the months of Magh.

In summary, highest mean return is observed during Ashad for the entire period and the 2nd half of the data. Also, there is lowest volatility in the month of Ashwin during entire period and the 1st half. Other findings are not consistent. To identify the existing Month-of-the- year effect further, GARCH (1,1) model is used and findings are presented below.

Table 4.13 shows that for the entire period, the return during the two months, Ashad and Shrawan is significant at 1 percent level of significance. There is significantly highest positive return observed in the month of Ashad as in the case of NEPSE Index return for the entire data set and significantly positive returns are also observed during the month of Shrawan. Hence, because of existence of month-of-the-year effect, hypothesis H_2 is accepted. Here, Falgun has insignificant lowest negative return.

Similarly, during the 1st half period, there is significantly positive returns in the months of
Baisakh, Ashad and Magh. Thus, month-of-the-year effect occurs in these months during the first half. Hence, hypothesis H_2 is accepted. Baisakh and Ashad returns are seen significant at 1 percent level whereas the returns in Magh are seen significant only at 5 percent level. There is significant highest positive return during Ashad which was also identified in the entire data set period and 2nd half of NEPSE Index return. Lowest insignificant returns are observed in the months of Jestha.

Similarly, during the 2nd half period, there is significantly positive returns during the months of the Ashad, Shrawan and Mangshir during the period. Hence, hypothesis H_2 is accepted. The return on Ashad and Mangshir are significant at 5 percent level of significance whereas the returns in the months of Shrawan is found significant at 1 percent level. Insignificant but lowest negative return is observed during the month of Kartik. The month of Ashad has significantly highest positive returns which is found in entire Sensitive data set as well as in splitting same data into two halves. Significantly highest positive returns were also observed in NEPSE Index return for entire period and the second half.

Table 4.13 GARCH (1,1) return equation results for Month-of-the-year effect for Sensitive Index

	Months	Coefficient	Std. Error	z-Statistic	Prob.
Entire Period	Baisakh (*D*Ba)	-0.0945	0.4657	-0.2029	0.8392
	Jestha (*D*Je)	-0.0434	0.3179	-0.1366	0.8914
	Ashad (*D*As)	1.2649	0.3503	3.6113	0.0003**
	Shrawan(*D*Sh)	0.8509	0.3336	2.5509	0.0107*
	Bhadra (*D*Bh)	-0.0513	0.5057	-0.1015	0.9192
	Ashwin (*D*Ash)	-0.0882	0.7278	-0.1212	0.9035
	Kartik (*D*Ka)	-0.1589	0.3489	-0.4554	0.6488
	Mangshir (*D*Ma)	0.4377	0.3174	1.3787	0.1680
	Poush (*D*Po)	0.4326	0.6202	0.6975	0.4855
	Magh (*D*Mag)	0.3412	0.5072	0.6726	0.5012
	Falgun (*D*Fa)	-0.2022	0.4107	-0.4923	0.6225
	Chaitra (*D*Ch)	0.4689	0.2896	1.6189	0.1055
1st Half	Baisakh (*D*Ba)	0.8820	0.2447	3.6046	0.0003**
	Jestha (*D*Je)	-1.1338	0.5913	-1.9174	0.0552
	Ashad (*D*As)	1.2924	0.3253	3.9724	0.0001**
	Shrawan(*D*Sh)	-0.3588	0.8079	-0.4441	0.6570
	Bhadra (*D*Bh)	-0.2119	1.3315	-0.1591	0.8736
	Ashwin (*D*Ash)	-0.3611	1.0956	-0.3296	0.7417
	Kartik (*D*Ka)	-0.0475	0.6005	-0.0791	0.9369
	Mangshir (*D*Ma)	0.7368	0.5590	1.3180	0.1875
	Poush (*D*Po)	-0.2249	0.5930	-0.3792	0.7045
	Magh (*D*Mag)	1.2279	0.5157	2.3810	0.0173*
	Falgun (*D*Fa)	-0.8749	1.6582	-0.5276	0.5978
	Chaitra (*D*Ch)	0.6116	0.4052	1.5093	0.1312
2nd Half	Baisakh (*D*Ba)	-0.4580	0.6604	-0.6936	0.4879
	Jestha (*D*Je)	0.1817	1.0031	0.1812	0.8562
	Ashad (*D*As)	1.7682	0.7267	2.4333	0.0150*
	Shrawan(*D*Sh)	1.4785	0.3036	4.8707	0.0000**
	Bhadra (*D*Bh)	0.2219	0.5933	0.3739	0.7085
	Ashwin (*D*Ash)	0.1191	1.1356	0.1049	0.9165
	Kartik (*D*Ka)	-0.3188	0.4199	-0.7592	0.4477
	Mangshir (*D*Ma)	0.6923	0.3404	2.0336	0.0420*
	Poush (*D*Po)	0.4150	2.0415	0.2033	0.8389
	Magh (*D*Mag)	0.0527	1.9070	0.0276	0.9780
	Falgun (*D*Fa)	0.2969	0.6585	0.4509	0.6520
	Chaitra (*D*Ch)	0.7595	0.4021	1.8887	0.0589

*significant at 5 percent level of significance

**significant at 1 percent level of significance

In summary, the study revealed the presence of significantly highest positive return during the month of Ashad during the entire period and the sub-periods for the Sensitive Index. Thus, Month-of-the-year effect prevails in the Sensitive Index.

To summarize the overall findings of specific month-of-the-year anomaly, significantly positive return is observed during the month of Ashad in the overall Sensitive Index and during overall period of NEPSE Index and 2nd half of the NEPSE Index. It can be conferred that there is month-of-the-year effect in NEPSE. These findings contradict with the findings of Maharjan (2013) however matches with the findings of Sharma (2015).

4.1.5 Holiday effect (Dashain effect)

The impact of holiday in the stock market return is pervasive. The tendency of generating significantly higher return on days before holiday than the return on days after holiday is called holiday effect. This phenomenon is called holiday effect. In this study also holiday effect is investigated by undertaking NEPSE Index and Sensitive Index of Nepal Stock Exchange. During the sample period from Shrawan 2060 to Ashad 2076, Dashain Festival has occurred 16 times. The return before start of Dashain holiday and after completion of Dashain; return before Saptami and After Dashami are undertaken for the study. For Sensitive Index, during the sample period that is from Bhadra 2066 to Ashad 2076, Dashain festival has occurred 10 times. During this period, this study has tried to identify if there is higher return on Pre-Dashian period than in Post-Dashain Period or vice versa. It is studied through descriptive statistics and GARCH (1,1) model.

Table 4.14 exhibits that, for NEPSE Index, the mean return on pre-dashian time is higher (0.0012 percent) than the post-dashain time. However, the mean returns on pre-dashain and post-dashain are lesser than the other day returns. There is higher volatility of return during pre-dashain time than post-dashain. However the volatility of return on other days of the week is the highest (1.2096 percent).

Table 4.14 Descriptive statistics for holiday (Dashain effect)

	Pre-Dashain (*D*pre)	**Post-Dashain (*D*post)**	**Other Day (*Dother)***
For NEPSE Index			
Mean	0.0012	0.0007	0.0402
Standard Deviation	0.0294	0.0554	1.2096
For Sensitive Index			
Mean	0.0012	0.0008	0.0566
Standard Deviation	0.0384	0.069	1.4105

Similarly, for Sensitive Index also, the mean return on pre-holiday is higher than post-holiday however the other day return is the highest (0.0566 percent). There is higher volatility in mean return during the post-holiday time however the volatility on other day is highest (1.4105 percent). To test the existence of holiday effect taking Dashain as holiday, GARCH (1,1) model is used.

Table 4.15 GARCH (1,1) results for holiday (Dashain) effect

	Coefficient	**Std. Error**	**z-Statistic**	**Prob.**
For NEPSE Index				
Pre-Dashain (*D*pre)	0.1077	0.3264	0.3301	0.7413
Post-Dashain (*Dpost)*	-0.0154	0.0963	-0.1595	0.8733
Other Day (*D*other)	-0.0006	0.0104	-0.0588	0.9531
For Sensitive Index				
Pre-Dashain (*D*pre)	-0.0718	0.4384	-0.1637	0.8699
Post-Dashain (*Dpost)*	-0.3093	0.1631	-1.8956	0.0580
Other Day (*D*other)	0.0193	0.0223	0.8642	0.3875

*significant at 5 percent level

**significant at 1 percent level

Table 4.15 reflects that, for NEPSE Index, the coefficients for none of the variables; pre- dashain, post-dashain and other days is significant. Hence hypothesis H_5 is rejected. However, the coefficient of pre-dashain period is higher than the post dashain period. This shows that there is no presence of Holiday Effect in Dashain.

Similarly, for Sensitive Index, there does not exist holiday effect in the sensitive returns. Though the coefficient of pre-holiday time is higher than the post-holiday period, however it could not be significant either at 1 percent or 5 percent level. Hence the hypothesis H_5 is rejected. The coefficient of both pre-holiday and post-

holiday are negative. The coefficient of other days is highest.

In sum, there does not exist holiday effect in NEPSE Index and Sensitive Index for the entire period. This result matches with the findings of KC and Joshi (2005) and contradicts with Sharma (2015).

4.2 Summary of results

This section comprises a proper visual representation of overall findings of the study. The Table 4.18 presents the major results of the analysis performed above. It contains the descriptive statistics comprising highest mean, lowest mean, highest standard deviation and lowest standard deviation for different types of anomalies in different periods. Furthermore, it also comprises the day or month which is found to have been providing significantly highest and significantl lowest returns during different time periods for NEPSE and Sensitive Index.

Table 4.16 Summary test results sheet

Descriptive Statistics Results							Garch (1,1) Results	
Index	**Type of Anomaly**	**Period**	**Highest mean**	**Lowest Mean**	**Highest SD**	**Lowest SD**	**Sig. Highest**	**Sig. lowest**
NEPSE	Day-of-the-week	Entire period	Thursday	Tuesday	Monday	Thursday	Thursday	None
		1st half	Sunday	Wednesday	Monday	Sunday	Sunday	Wednesday
		2nd half	Thursday	Monday	Sunday	Thursday	Thursday	Sunday
		1st bull to 2nd bull	Sunday	Tuesday	Monday	Sunday	Sunday	Wednesday
		2nd bull to 3rd bull	Thursday	Tuesday	Sunday	Wednesday	None	None
		3rd bull to 4th bull	Thursday	Monday	Sunday	Thursday	Thursday	Sunday
		1st bear to 2nd bear	Thursday	Wednesday	Tuesday	Wednesday	Sunday	Wednesday
		2nd bear to 3rd bear	Thursday	Tuesday	Sunday	Wednesday	None	Monday
Sensitive	Day-of-the-week	Entire period	Thursday	Monday	Sunday	Thursday	Thursday	Monday
		1st half	Thursday	Monday	Sunday	Wednesday	Thursday	Monday
		2nd half	Thursday	Sunday	Sunday	Thursday	Thursday	None
		2nd bull to 3rd bull	Thursday	Tuesday	Tuesday	Wednesday	None	None
		3rd bull to 4th bull	Thursday	Monday	Sunday	Thursday	Thursday	None
		2nd bear to 3rd bear	Thursday	Monday	Sunday	Thursday	None	Monday
NEPSE	Month-of- the-year	Entire period	Ashad	Jestha	Bhadra	Ashwin	Ashad	None
		1st half	Kartik	Falgun	Falgun	Ashwin	Shrawan	Bhadra
		2nd half	Ashad	Bhadra	Ashad	Falgun	Ashad	Bhadra
Sensitive	Month-of- the-year	Entire period	Ashad	Jestha	Baisakh	Ashwin	Ashad	None
		1st half	Magh	Jestha	Ashad	Bhadra	Ashad	None
		2nd half	Ashad	Baisakh	Baisakh	Magh	Ashad	None
NEPSE	Holiday	Entire period	Pre-Dashain	Post-Dashain	Pre-Dashain	Post- Dashain	None	None
Sensitive	Holiday	Entire period	Pre-Dashain	Post-Dashain	Pre-Dashain	Post- Dashain	None	None

4.3 Findings of the research

To come up with the findings in this study, descriptive statistics involving mean and standard deviation is calculated and further to test the significance of the returns, GARCH (1,1) model is employed. Calendar anomalies for both NEPSE Index as well as Sensitive Index is studied.

The major findings of the study are

i. The descriptive statistics of NEPSE Index for entire data set has revealed that there is highest mean return on Thursday (0.0276 percent) and the lowest (-0.0013 percent) mean return on Tuesday. However, during the first half the mean return on Sunday is highest (0.0180 percent) over the period and return on Wednesday is lowest (-0.0047 percent). But, during the second half mean return on Thursday is highest (0.0414 percent) and there is lowest (-0.0159 percent) mean return on Monday.

ii. The GARCH (1,1) results on NEPSE Index for entire period revealed significantly highest return on Thursday. But, during the 1st half, significantly higher return is observed on Sunday and significantly lower return were observed on Wednesday. However, during 2nd half, there is significantly highest return on Thursday and significantly lower returns on Sunday.

iii. From 1st bull to 2nd bull on NEPSE Index, the mean return on Sunday is highest (0.0205 percent) and the mean return on Tuesday is lowest (0.0004 percent). However, during 2nd bull to 3rd bull, mean return on Thursday is highest (0.0880 percent) and the mean return on Tuesday is lowest (-0.0397 percent). But during 3rd bull to 4th bull, mean return on Thursday is highest (0.0396 percent) and the mean return on Monday was the lowest (-0.0172 percent).

iv. As per GARCH (1,1) results, during 1st bull to 2nd bull significantly higher return are observed on Sunday during the period and significantly lower return are observed on Wednesday for NEPSE Index. But, none of the days were found having significant return during 2nd bull to 3rd bull. During 3rd bull to 4th bull, significantly higher return were observed on Thursday and significantly lower returns were observed on Sunday.

v. In NEPSE Index return, during 1st bear to 2nd bear, there is highest (0.0218 percent) mean return on Thursday and lowest (0.0102 percent) mean return is seen on Wednesday. Also, during 2nd bear to 3rd bear, there is highest mean return (0.017

percent) on Thursday but lowest (-0.0639 percent) mean return on Monday. Highest mean return is observed in the same day during the both periods.

vi. As per GARCH (1,1) results, during 1st bear to 2nd bear, significantly positive highest mean return is found on Sunday as it is found during 1st half and 2nd half period whereas significantly lowest mean return are observed on Wednesday. However, none of the days mean return is found significantly highest during 2nd bear to 3rd bear though the return on Monday is found significantly lowest.

vii. The descriptive statistics for entire data of Sensitive Index revealed that highest mean return (0.0583 percent) is realized on Thursday only however lowest mean return (-0.0128 percent) is observed on Monday. Also, during the 1st half of the data set, mean return on Thursday is the highest (0.0571 percent) and the mean return on Monday is the lowest (-0.0473 percent) for the period. Also, during the 2nd half, mean return on Thursday is highest (0.0596 percent) whereas the mean return on Tuesday was the lowest (0.0128 percent) for the period.

viii. GARCH (1,1) results for the Sensitive Index revealed that Thursday returns are significantly highest positive and Monday returns are found significantly lower than other days of the week. Also, during the 2nd half, significantly higher returns are observed on Thursday and significantly lower return is observed on Monday. Results for 2nd half revealed that there is significantly highest return on Thursday for Sensitive Index and significantly lower returns is not found.

ix. During 2nd bull to 3rd bull, the mean return on Sensitive Index the mean return on Thursday is the highest (0.0879 percent) positive whereas the mean return on Tuesday is the lowest (-0.0527 percent) negative. Also, during 3rd bull to 4th bull, Thursday has the highest (0.0416 percent) mean return and also lowest whereas, Monday has the lowest (-0.01995 percent) mean return. Furthermore, during 2nd bear to 3rd bear highest (0.0052 percent) mean return is observed on Thursday and lowest (-0.0647 percent) mean return is observed on Monday.

x. From GARCH (1,1) results, no days were identified having significant returns during 2nd bull to 3rd bull. However, during 3rd bull to 4th bull, significantly highest return were found on Thursday. During, 2nd bear and 3rd bear, mean return on Sunday, Monday and Tuesday are found significantly negative.

xi. For Month-of-the-year effect of NEPSE Index return in entire period descriptive statistics has revealed that mean return on Ashad is highest (0.4928 percent) and mean return on Jestha was the lowest (-0.2192 percent). Furthermore, during 1st half, there is highest mean return (0.4795 percent) in Kartik whereas lowest mean return (-0.4192 percent) is found in Falgun. Similarly, during 2nd half, highest positive mean return (0.6845 percent) is found in Ashad and the lowest negative mean return (-0.4363 percent) in Bhadra.

xii. For entire period, in NEPSE Index significantly higher returns are found in Ashad. But, during 2nd half, significantly higher return are found in the Shrawan for NEPSE Index and significantly lower returns are observed in Bhadra for NEPSE Index. Furthermore, significantly positive return is observed for NEPSE Index in Ashad whereas significantly lower return is observed for NEPSE Index during Bhadra.

xiii. For Month-of-the-year effect on Sensitive Index, there is highest positive return (0.1187 percent) mean return during the month of Ashad and lowest negative return (-0.0399 percent) mean return in Jestha. Whereas, during 1st half of the sensitive index, the mean monthly return for the month of Magh is highest (0.0905 percent) and the mean monthly return for the month of Jestha is the lowest (-0.0946 percent). During, 2nd half, highest (0.1173 percent) mean return is observed in the months of Ashad and lowest (-0.1066 percent) mean monthly return is observed in the months of Baisakh.

xiv. For entire period, 1st half and 2nd half of Sensitive Index, consistently, significantly higher returns is found in the Month of Ashad. However, no months are revealed having significantly lower return.

xv. The study of Holiday (Dahsain) Effect for NEPSE Index as well as Sensitive Index revealed that the return on pre-holiday is not significantly different from post-holiday. Thus holiday, effect does not prevail.

CHAPTER V

CONCLUSIONS

This chapter comprises the summary of research, conclusion drawn from the study and implications. The discussion segment involves the comparison of the findings of this study with the past national and international research works. The conclusion segment involves the inferences drawn from the study whereas implication segment involves the utility and contribution of the study.

5.1 Summary

Since the formation of EMH markets are often tested for their efficiency. Existence of calendar anomalies in the stock market are huge obstruction to the efficiency of the stock market. Normally, fair play is expected in an efficient market. But if the markets are inefficient benefits may be derived from the market by some smart investors. Calendar anomalies under this study are month-of-the-year effect, day-of-the-week effect, and holiday (Dashain) effect.

This study has tried to trace the calendar anomalies by undertaking NEPSE Index which is a value weighted Index produced by NEPSE every day. Furthermore, Sensitive Index is also undertaken for study which is the Index of 'A' grade companies listed in NEPSE. This study involves NEPSE Index from Mid-July, 2003 (Shrawan, 2060) to Mid-July, 2019 (Ashad, 2076) also the Sensitive Index from September, 2009 (Bhadra, 2066) to Mid-July, 2019 (Ashad, 2076).

The findings for reveal highest positive return on Thursday in NEPSE and Sensitive Index in entire period and sub-periods except on 1st half of NEPSE Index and during 1st bull to 2nd bull period. During, 1st half period, 1st bear to 2nd bear period and 1st bear to 2nd bear period in NEPSE Index significantly highest positive return is observed on Sunday. Later periods are revealed to be having significantly highest positive return on Thursday. This gives an evidence that the day-of-the-week anomaly has changed from Sunday to Thursday. The highest return on Thursday is a newly appearing anomaly which shifted from Sunday to Thursday. The findings of this study are consistent with Maharjan (2013) and Sharma (2015) that there is significantly higher return on Thursday and contradicts with the findings of KC and Joshi (2005) which found significantly negative returns during Thursday. However, as found by Maharjan

(2013) there is no significantly negative return observed during Tuesday. These findings are not consistent with the findings of Hooi, Keung, amd Russel (2007), Winkelried and Iberico (2015), Chia, Liew, Wafa, and Wafa (2008), and S, Safeer, and Kevin (2014) which did not exhibit significant return on Thursday. Since, in context of NEPAL Thursday is the last trading day whereas in most of the countrie in the world the last trading day is Friday. This may be the root cause of anomalies identified in other days in foreign stock markets. However, Shahid (2015) identified significant weekend effect in Pakistan which can be related to Nepalese context also. Rahman and Amin (2011) have identified Thursday effect in stock market of Bangladesh.

This study has revealed significantly higher positive return in the month of Ashad for different periods and sub-periods in both NEPSE as well as Sensitive Index. These findings are consistent with findings of Sharma (2015). Maharjan (2013) had identified significanlty higher return in the month of Jestha. However, no consistence evidence of significantly negative return in any month is found in present study. Pant (2010) has not revealed any month-of-the-year anomaly in Ashad. Findings of present study are contrasting with KC and Joshi (2005) which has identified disappearing month-of-the-year anomaly. Swami (2011) has found no month-of-the-year effect in south Asian countries involving Nepal which contrasts with findings of this study. Studies in foreign markets by Hooi, Keung, and Russel (2007) in major Asian Markets, also does not match with the findings of this study. Data, trading day, time of study and investment behavior can be possible causes for inconsistent results. The primary data has revealed different periods for making investment and selling. The subjects have held the opinion that it is best time to enter the market during

Poush to Chaitra since the prices of shares mostly fall down during this period. Also, it is best time to sell off during Jestha to Shrawan time. These findings match with Dangol (2010) who identified significantly lower returns during Poush to Falgun period and significantly higher return during Baisakh to Shrawan period.

Holiday effect is revealed in the stock markets around the world like Lu and Patel (2016) have found significantly higher returns on day after holiday than other trading days in stock market of India. Cao, Premchandra, Bhabra, and Tang (2009) have found holiday effect in Newzealand where the analysis of individual holiday returns has indicated that the pre- holiday mean return is highest prior to Christmas, followed

by Easter. Dodd and Gakhovich (2018) have conducted study in Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Russia, Serbia, Slovakia, Slovenia and the Ukraine and have confirmed the presence of significantly positive pre and post- holiday returns. This study has also investigated the holiday effect in context of Nepalese stock market by undertaking NEPSE Index as well as Sensitive Index. The study has revealed that there is no presence of holiday (Dashain) effect in Nepalese stock market either by undertaking NEPSE Index or by undertaking Sensitive Index. These findngs contradict with the findings of Sharma (2013) who has identified that return in pre-holiday period is significantly different than return on post-holiday period. Significanlty lower return during Ashwin Krishna Pakchha (pre-Dashain period) is also identified by Pant (2010). The primary data however, revealed the presence of Holiday (Dashian) effect. The respondents have held belief that the pre- Dashian return are lesser than the post- dashain period.

5.2 Conclusion

Nepalese stock market is inefficient at weak form. This study on calendar anomalies has revealed the presence of day-of-the-week effect in Nepalese capital market. For NEPSE Index, evidences are found for significantly positive return on Thursday. There is shift in day-of-the-week anomaly from Sunday to Thursday after Shrawan, 2068. Return on Sensitive Index had also revealed a consistent evidence of significantly higher return on Thursday but no persistence evidence is found for significantly lower returns.

There is existence of Month-of-the-year effect in Nepalese capital market. Significantly positive return is observed in NEPSE Index as well as Sensitive Index in Ashad. Furthermore, significantly lower return is found in NEPSE Index in the Month of Bhadra while splitting the data into two halves. But no significantly lower return is found in Sensitive Index. The study has revealed no presence of Holiday (Dashian) effect. The return on pre-holiday was not significantly different from post-holiday taking Dashain as holiday in case of both Indices.

5.3 Implications

This study has revealed that Nepalese stock market is inefficient at weak form. So, careful and through study of calendar anomalies and technical aspects of NEPSE can lead to generation of extra benefits from the market. Since, significantly positive

returns are observed on Thursday, an investor can derive benefit by selling the securities in this day. Furthermore, the investor can sell the holdings in Ashad because this month has significantly positive return. Thus, the findings of this study can be crucial to make investment decision for the investors. Furthermore, the regulatory authorities of NEPSE can also take initiatives to make the market more efficient so that everyone would derive a fair benefit from their investments.

Future studies can be conducted by undertaking other sub-indices like Banking Index, Hotels Index, Development Bank Index, Hydropower Index, Finance Index and Insurance Index. This study has used GARCH (1,1) model only, further studies can be conducted by using EGARCH and TARCH models.

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