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A Re-examination of the Holiday Effect in Stock Returns: The Case of Vietnam

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Abstract: This paper provides empirical evidence of the holiday effect in stock return and the implications of the holiday effect. The research finds that there are existing the high stock return before the Lunar new year on the Ho Chi Minh Stock Exchange during the period 2002-2018. This paper using the GARCH, Modified-GARCH, GARCH-M, and EGARCH models to test the holiday effect on stock return. The results indicate that there is evidence of holiday such as Chinese New Year in Vietnam which is called Lunar new year effect on stock return. Specifically, the stock return before the Lunar new year is usually higher than after the Lunar new year on the Ho Chi Minh Stock Exchange.

Keywords: *Calendar effects, Efficient market hypothesis, Dummy variable regression, Holiday effect, VN-Index and Lunar New Year.*
Abbreviations: *EMH-Efficient Market Hypothesis, GARCH-Generalized Autoregressive Conditional Heteroskedasticity, AIC-Akaike Info Criterion, ASX-Australian Stock Exchange and SC-Schwarz Criterion.*

1. Introduction

Stock market efficiency is an essential property of the market. The classic paradigm of Efficient Market Hypothesis (EMH) was widely accepted since the early 1970's and is based on three essential pillars such as investor rationality, uncorrelated errors, and the assumption that there are no limits to arbitrage. According to Fama [1] the ideal financial market would be guided by the principle that prices provide accurate signals for resource allocation. It implies that rational, profit-maximizing investors are not able to consistently outperform the market since prices of stocks in the market are fair, that is, there are no undervalued stocks in the market. Price shocks also are an integral part of the stock market. The flow of news is continuous and practically infinite, and from time to time some of them may be very influential for a given stock, a group of stocks or the stock market in general, and lead to large stock price changes, representing both a serious risk and a great opportunity for stock market investors.

A vast strand of financial literature deals with large one-day stock price changes and their consequences. The major research question of these studies is: What are the patterns of stock returns following index market changes and can we predict these returns to build a profitable investment strategy? The answers to this question vary as a function of the samples analyzed by the authors and the research approaches applied by them. A few studies [2-5] document price reversals following initial price moves, and therefore, suggest that the latter contain some element of overreaction. Another cohort of studies either does not detect any significant price patterns following major price changes [6-8] or finds some evidence of reversals, but concludes that they are relatively small and cannot be practically used for generating profitable investment opportunities [9-11]. The third influential group of studies [12-15] suggests that large stock price moves should be analyzed in a wider company-specific context, and concentrates on the role of public information in determining subsequent price patterns. The general conclusion arising from this literature is that stock price moves accompanied by public information releases result in price drifts, indicating that investors tend to underreact to news about fundamentals, while those that are not accompanied by any public news are followed by reversals, suggesting that investors tend to overreact to other shocks that move stock prices, such as shifts in investor sentiment or liquidity shocks.

The holiday effect is one of the most widely analyzed calendar anomalies in stock markets. Its best-known aspect refers to the observed fact that stock returns typically exhibit consistent patterns around holidays, with systematically higher returns on days prior to major holidays. The holiday effect is well-documented both in the US [16-18] and worldwide [19-22] stock markets. The dominating explanation for the existence of the holiday effect lies in investor psychology [18, 23] suggesting that investors tend to buy stocks before holidays because of 'high spirits' and 'holiday euphoria' [24, 25] which cause them to expect positive returns in the sequel. In recent empirical studies on calendar anomalies or seasonal anomalies revealed that some of the calendar anomalies like day of the week effect [26] month of the year effect and turn of the month effect seem to have weakened or disappeared over the sample time period. To test the existence of the holiday effect in the Vietnamese stock market, the study is based on the daily return rate data sample of the VN-Index from March 1st, 2002. The period before Lunar New Year is defined as 5 trading days before the market closes for Lunar New Year holiday. Similarly, the period after the Lunar New Year is defined as 5 trading days after the Lunar New Year holiday when the stock market is active again. The difference in the return on indices in the period around the Lunar New Year compared to the rest of the trading days is the basis for testing the existence of the Lunar New Year effect on the Vietnamese stock market. This study uses the following quantitative data analysis methods: basic descriptive statistical method, Generalized Autoregressive Conditional Heteroskedasticity (GARCH).

2. Literature Review

The holiday effect is one of the seasonal phenomena and this phenomenon presents a contradiction with the efficient market theory an important financial hypothesis. Seasonal phenomena can be understood as seasonal effects that produce either higher or lower returns depending on the nature of the time series. These effects are also known as market anomalies because these anomalies cannot be explained by traditional asset pricing models. Examples of some popular effects such as January Effect, Day-of-the week Effect, Turn of the month Effect, holiday effect.

The holiday effect was first identified by Fields [27] since then there has been much debate about the effect of the holiday. Ariel [28]; Lakonishok and Smidt [16] show in their in-depth studies that pre-holiday returns are higher than post-holiday returns. Unusual returns were found not only over the weekend but for any given moment of trading. Lakonishok and Smidt even pointed out that the holiday effect accounted for about 30-50% of the total return on the US market in the early 1987. Ariel showed that pre-holiday returns were eight times higher than post-holiday returns. He found that 8 public holidays per year accounted for 38% of total annual return rate. Kim and Park [17]; Brockman and Michayluk [18] also found that the US holiday affected market indices from the New York Stock Exchange, AMEX and NASDAQ from 1963-1987 and 1987-1993. Many other scholars have also analyzed, have taken a closer look at stock returns both before and after each holiday. Their research has shown differences in holidays in countries other than the US (Canada, Japan, Hong Kong and Australia [29] Turkey [25, 30].

Cadsby and Ratner have studied the holiday effect in international markets [6, 29]. They observed Canadian, Japanese, Hong Kong and Australian markets from 1962 to 1989 and examined local holidays and market indicators from each country. The results point to a significant pre-holiday effect in all observed markets, with highest returns occurring in the days before the holiday. Kim and Park provided further evidence of the holiday effect in research on the Nikkei (Japan) and the Financial Times (UK), confirming the results of Cadsby and Ratner [29] for the Japanese market. Subsequently, Kim and Park [17] also noted an effect of the size of firms in these markets [19]. Examined the validity of vacation in 17 markets in different countries. Their results show a clear 65% effect at the pre-holiday in the observed samples. Studies in Southeast Asia [6, 29, 31-34] have identified the presence of a New Year effect in China. Yen and Shyy [33] find evidence that stock yields of post-holiday are significantly higher than pre-holiday in Hong Kong, Japan, Malaysia, Singapore, Korea and Taiwan. Wong, et al. [31] determined that both Chinese New Year and Ramadan's holiday had an impact on the Kuala Lumpur stock market; Chan, et al. [34] confirmed the impact of the Chinese New Year on Thailand, Singapore and Malaysia markets along with the Hindu holiday effect in Singapore and Malaysia.

Worthington [20] examined the holiday effect in the Australian market and concluded that the holiday effect is limited to small firms. He used 12 different stock indices in the Australian stock exchange over a 10-year period (1996-2006) providing 2,635 observations on the Australian Stock Exchange (ASX). His experiments showed that the holiday effect in market representation indices with stock returns before vacation is often 5 times higher than on other normal days. His research shows that the performance of small-cap companies before the holiday, and for small-value stocks, returns 10 times higher than on other trading days. The main

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explanations of the holiday phenomenon are explained in detail according to the following hypotheses of the efficient market theory. Firstly, it can be explained by the investment psychology. Arguably the most promising explanation for the holiday effect lies in investor sentiment [18, 23]. The theory shows that investors tend to buy stocks before the holiday because of "being in good shape" and "holiday excitement". Secondly, it can be explained by the end of the transaction. One possible explanation is that high pre-holiday returns are an expression of good closing prices, where high returns on stocks are observed at the closing market. One research team linked pre-vacation activity to the system models in the data set used to calculate pre-holiday returns. On the behavior side, the explanations include from short-term sellers who end up risk before the holiday, with psychological reasons such as investors' good sentiment around vacations showing more optimism about the future.

3. Data's and Research Methodology

To test the existence of the Lunar New Year effect in the Vietnamese stock market, this study has collected the data of the VN-Index from March 1st, 2002 to the end of 2018. The research chose the starting time of the data set is 2002 because the first 2 years (from 28/7/2000 the liquidity of the Vietnamese market is still low, there are only 3 transaction per week and the value of the transaction is low). The VN-Index daily closing price data was collected from March 1st, 2002 to December 31st, 2018, for a total of 4190 observations from the Ho Chi Minh City Stock Exchange. The VN-Index daily data is used to calculate the daily rate of return by using the following formula:

$$R_t = \frac{P_t - P_{t-1}}{P_t}$$

3.1. Including

Rt is stock return from day t-1 to day t

P_t is closing price at day t

P_{t-1} is closing price at day t-1

This study stipulates that the period before the Lunar New Year is 5 trading days before, and the period after the Lunar New Year is 5 trading days after. Since the Lunar New Year will take place according to the repetitive rule of late January, early February, and late February, if a longer observation range such as 15 days is used, it may be affected by the January Effect. This study will apply the GARCH model (1,1) and its extended models, and consider these models under the student-t distribution. Similar models are applied by many previous studies such as that of Lakonishok and Smidt [16]; Fields [27]; Chan, et al. [34]. The GARCH (1,1) model will be developed to estimate the coefficients of the variables and evaluate the significance of each coefficient.

3.2. The model GARCH (1,1) in this study has the following equation

Expected equation

$$\boldsymbol{R_t = C + \beta_1 x\, Pre + \beta_2 x\, Post + \varepsilon}$$

3.3. Including

Rt is the rate of return of the VN-Index

C is a constant, equal to the rate of return on regular trading days

Pre is a dummy variable that takes value of 1 for the period of 5 business days before the Lunar New Year holiday and 0 for the remaining trading days.

Post is a dummy variable that takes value of 1 for the period of 5 business days after the Lunar New Year holiday and zero value for the rest of the trading days.

ε is the error (remainder) of the regression model.

3.4. Variance Equation

$$\boldsymbol{\sigma_t^2 = \alpha_0 + \alpha_1 x\, \varepsilon_{t-1}^2 + \alpha_2 x\, \sigma_{t-2}^2} (2)$$

3.5. Including

$\boldsymbol{\alpha_0}$ Is a constant

$\boldsymbol{\varepsilon_{t-1}^2}$ Gives information about the previous time fluctuation determined by squaring the error (remainder) from the expected equation. (ARCH term)

$\boldsymbol{\sigma_{t-2}^2}$ is the predictive variance in the previous period (GARCH term)

The Modified-GARCH (1,1) modified GARCH model adds the impact of the pre- and post-Lunar New Year periods to the variance equation by adding dummy variables Pre and Post. The Modified-GARCH (1,1) model looks like this:

$$\boldsymbol{R_t = C + \beta_1 x\, Pre + \beta_2 x\, Post + \varepsilon}$$

$$\boldsymbol{\sigma_t^2 = \alpha_0 + \alpha_1\, \varepsilon_{t-1}^2 + \alpha_2\, \sigma_{t-2}^2 + \gamma_1 Pre + \gamma_2\, Post} \quad (3)$$

Next, to observe the relationship between the return and the respective risk, the variance $\boldsymbol{\sigma_{t-2}^2}$ is added to the right side of the expected equation (1). The GARCH-M model looks like this

$$\boldsymbol{R_t = C + \beta_1 x\, Pre + \beta_2 x\, Post + \beta_3\, \sigma_t^2 + \varepsilon} \quad (4)$$

$$\boldsymbol{\sigma_t^2 = \alpha_0 + \alpha_1\, \varepsilon_{t-1}^2 + \alpha_2\, \sigma_{t-1}^2}$$

Another popular extended model of the GARCH model proposed by Nelson [35] is the Exponential General Autoregressive Conditional Heteroskedastic (EGARCH) or EGARCH (EGARCH) model. The EGARCH model has the following equation

$$\boldsymbol{R_t = C + \beta_1 x\, Pre + \beta_2 x\, Post + \varepsilon}$$

$$\log\left(\sigma_t^2\right) = \alpha_0 + \alpha_1 + \left|\frac{\varepsilon_{t-1}}{\sigma_{t-1}}\right| + \gamma\, \frac{\varepsilon_{t-1}}{\sigma_{t-1}} + \alpha_2 \log(\sigma_{t-1}^2$$

As can be seen, since $\boldsymbol{\log(\sigma_{t-1}^2)}$ can be negative while $\log\left(\sigma_t^2\right)$ is always positive, the EGARCH model removes the constraints of the usual GARCH model parameters.

The study will use EViews software to apply GARCH, Modified-GARCH, GARCH-M and EGARCH models in turn to test the existence of the Lunar New Year effect on the stock return. After that the research compares the Akaike Info Criterion (AIC) and Schwarz Criterion (SC) to find the most suitable model.

4. Empirical Result

Table 1 and **Table 2** report the basic descriptive statistical results and the estimated results of the stock return as well as the periods around the Lunar New Year.

Table 1.
Descriptive statistic of stock return.

	N	Mean	Std. deviation
Rt_VN_index	4190	0.0368	1.40513
Pre lunar new year	80	0.45555	1.27358
Post lunar new year	80	0.18406	1.84693
Lunar new year _period	160	0.3198	1.58723
Regular_day	4030	0.02556	1.39645

Firstly, the study classified 4190 daily return of VN-Index into periods before Lunar New Year, after Lunar New Year and other trading days. During the period before Lunar New Year and after Lunar New Year, there are 80 observations, a total of 160 observations around the Lunar New Year, the remaining 4030 observations of the remaining trading days. From Table 1, the VN-Index's average daily return is 0.03680 with a standard deviation of 1.40513 while the average return on trading days outside the Lunar New Year period is low, it is 0.02556.

Table 2.
Result of ARCH estimation.

Variable	GARCH (1, 1)	Modified-GARCH (1,1)	GARCH-M	EGARCH
Expected equation				
GARCH			0.02943	
C	0.00913	0.01111	-0.01624	0.00862
PRE_Lunar New Year	0.17604	0.19718	0.17119	0.21972
POST_Lunar New Year	0.04596	-0.02971	0.03563	-0.00257
Variance equation				
α_0	0.02867	0.02694	0.02842	-0.29897
α_1	0.21085	0.20604	0.21094	0.39921
α_2	0.79381	0.79887	0.79404	-0.02264
γ				0.96853
PRE_Lunar new year		0.15402		
POST_Lunar New year		-0.12914		
AIC	3.08164	3.08022	3.08051	3.04264
SC	3.09071	3.09232	3.0911	3.05475

The average daily stock return of the 5-day period before the Lunar New Year is 0.45555, many times higher than that of the whole VN-Index and with normal trading days. However, the deviation of the post- Lunar New Year return rate is higher than the average for the whole index, meaning that the risk of the post-Lunar New Year period is higher than the average. In addition, the Lunar New Year period also brings a higher than normal rate of return but does not come with a higher level of risk. From there, the existence of a positive effect of the Lunar New Year period on the VN-Index is completely grounded.

In general, through analyzing the preliminary statistical statistics, it can initially be seen that the existence of the Lunar New Year effect on the VN-Index is quite clear, especially in the period before Lunar New Year. Up to this step, some previous studies such as by Mills and Andrew Coutts [36] have concluded the existence of a holiday effect in the UK stock market from 1986 to 1992. However, this is also the limitation of these studies because it will be the lack of conclusion when the stock return data source indicators do not follow the normal distribution.

This shows that if only based on the average return, standard deviation to conclude the existence of the Lunar New Year effect on the VN-Index will be a major omission.

Models GARCH (1,1), adjusted GARCH (1,1), GARCH-M and EGARCH were applied to estimate the coefficients of the rate of return in the period before and after the Lunar New Year. Table 2 presents the regression results on the Lunar New Year effect and the volatility of stock returns from March 1, 2002 to December 31, 2018. To find the optimal model among the above 4 models, we use the Akaike info criterion (AIC) and the Schwarz Criterion (SC). These indicators are in which model the smallest value gives the best model. We see, EGARCH model has the lowest AIC and SIC indices, so this model is more optimal than the other models. Estimated results by EGARCH model, the trading days outside the Lunar New Year period give a low profit margin of 0.21972 and the positive effect of the period before the Lunar New Year exists at 5% significance level.

The stock return after Lunar New Year holiday was lower than other days, but it was not statistically significant at 5%. The equation of variance with the addition of an asymmetric coefficient value less than 0 indicates that positive effects (good news) will cause lower volatility than negative effects (bad news). At the same time, there is no sign of leverage effect on the VN-Index. However, the coefficient is not statistically significant. Through the EGARCH model, this study noted the positive influence of the period before the Lunar New Year, in other words the existence of the Lunar New Year effect on the VN-Index.

5. Conclusions

Based on previous studies related to the calendar effect, especially the holiday effect, this study examines the existence of the Lunar New Year effect on the Vietnamese stock market through VN-Index data from March 1, 2002 to December 31, 2018. Simple descriptive statistics show that the stock return in the period before and after the Lunar New Year is higher than the average of the remaining trading days. However, the impact index of the period before Lunar New Year is statistically significant. Regression model according to the ARCH is applied in this study.

The OLS method is the simplest and is also widely used in previous experimental studies, but the conclusion is inconsistent because of the existence of cointegration and variable variance of the data series. The GARCH (1,1) model allows variance to change over time. The Modified-GARCH (1,1) model adds the impact of periods before and after the Lunar New Year to the equation of variance. The GARCH-M model adds a risk factor to the regression equation. The EGARCH model removes the constraint of parameters in conventional GARCH models. Although the above models all have their own advantages and the regression results are quite similar, the research selected EGARCH model as the most optimal model to publish conclusions.

Regression results from the EGARCH model recognized the existence of a positive impact of the period before the Lunar New Year on the stock return of the VN-Index. The results of this study present clear evidence of the existence of the Lunar New Year effect on the Vietnamese stock market. The emergence of a seasonal phenomenon (holiday effect) on the Ho Chi Minh City Stock Exchange has proven ineffective in the market, the most obvious manifestation of which is the existence of the period around the Lunar New Year. The stock return increased many times compared to the average of normal trading days but not accompanied by an increase in risk made it difficult for investors to sit still and watch. Investors can refer to the results of this study to determine their investment duration. Investors can take advantage of the Lunar New Year effect, buy stocks in corrective sessions before the Lunar New Year and hold until the period before Lunar New Year to sell when the market rallies. Short-term investors can fully apply the strategy of buying in in the correction sessions before the Lunar New Year and selling in the last trading session before Lunar New Year holiday. However, investors should note that if all investors apply similar investment tactics to take advantage of the Lunar New Year effect, this effect will disappear and disable the above investment strategies.

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