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THE MONTH OF THE YEAR EFFECT: EMPIRICAL EVIDENCE FROM COLOMBO STOCK EXCHANGE

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Abstract
Many researchers have tested whether the seasonal anomalies are present in the stock markets. Those studies have been carried out in the stock markets both in the developed and developing economies. Existence of seasonal anomalies let the investors to earn abnormal returns by trading on past information. Most common seasonal anomalies are day of the week effect, month of the year effect, holiday effect, Monday effect and Friday effect. Although information technology and regulatory mechanisms are much stronger than ever, there are strong evidences to support that seasonal anomalies exist in stock exchanges both in developing and developed countries. Furthermore, Colombo Stock Exchange has been named recently as one of the stock exchanges with higher returns in the world. Thus, it is of paramount importance identify how those returns are made of. Abnormal returns gained from anomalies cannot be justified from a risk-return standpoint. Yet it remains as an important element of stock returns. This study attempts to examine whether the month of the year effect and January effect are present in the Colombo Stock Exchange based on data from January 2000 to December 2011. For the purpose of analysis, non linear GARCH t model is employed along with other techniques due to its strong capability to detect such anomalies. Results provide evidence to support the claim that both the month of year effect and January effect exist in the Colombo Stock Exchange despite its use of modern information technology infrastructure and regulatory developments.

Keywords: Seasonal Anomalies, The month of the year effect, January effect, Stock returns

1. Introduction

The efficient market hypothesis is one of the most important areas in modern finance. The information processing efficiency of a capital market refers to a stock market's ability to price stocks fairly and quickly. Number of studies was conducted to test this capital market efficiency or the efficient market hypothesis (EMH), and recently researches have collected evidence against the EMH. This evidence implies that stock price anomalies could be present in the capital markets. So that investors can earn abnormal returns using past information.

In financial markets, anomalies refer to situations when a security or group of securities performs contrary to the notion of efficient markets, where security prices are said to reflect all available information at any point in time (Investopedia, 2009). Among such anomalies, Calendar effects are seen as the most important patterns and have been widely studied and documented in the financial literature for the last decade (Bepari K. and Mollik A.T.,

2009, Dr.D.S.Selvakumar 2011). Anomalies that are linked to a particular time are called calendar effects (Investopedia, 2009). Some of the most popular calendar effects include the weekend effect, month of the year effect and the January effect.

January and the month of the year effect has been examined and investigated in various studies. For instance, the months of the year effect would exist if returns on particular months are higher than other months. This will contradict the notion of efficiency in markets, since traders will be able to earn abnormal returns just by examining patterns, monthly returns and setting trading strategies accordingly. This will involve an inefficient market situation where returns are not proportionate with risk.

According to literature, the Sri Lankan stock market (Colombo Stock Exchange) is considered as a weak form efficient market (Abeyrathna G. and Power D.M., 1995). So, stock price anomalies could be present in the market. Literature for the past decade has been documented on this issue in several occasions in Sri Lanka. But most of them were conducted only on the day of the week effect. So, the purpose of this study therefore, is to investigate the existence of the monthly pattern in the Colombo Stock Exchange. The results of this study should provide important insights on the investing environment and also serve as useful information for devising investment strategies for stock market participants.

2. Literature Review

Seasonality in stock returns means the average returns are not same in all periods. The month of the year effect would be present when returns in some months are higher than other months. One of the most common and interesting finding of the researches carried out in the month of the year effects anomaly is the “January Effect”. It is highly argued that the returns of stocks in this particular month are far different and significant from the rest of the years returns. This highly violates the efficient market hypothesis(EMH) that partially developed by the Fama E. in the 1960s.

The first study that combined the January and size anomalies was by the Keim (1983). He reported that small firm returns during the month of January are significantly higher than large firm returns and that approximately 50 percent of the size effect appears in January.

According to the findings of Pandey I.M. (2002), in the USA and some other countries, the year end month or the month of December is the tax month. Based on this fact, a number of empirical studies have found the “Year end” effect and the “January effect” in stock returns. It is argued that investors sell shares the values of which have declined in order to reduce their taxes. This put a downward pressure on the stock prices and thus lower stock returns. As soon as the tax year ends, investors start buying shares and stock prices experience upward trend. This causes higher returns in the beginning of the year, that is in the month of January (Bepari K. and Mollik A.T., 2009). This is in consistent with the “Tax loss selling” hypothesis (Wachtel 1942).

Empirical studies have found that the January effect appears not only in developed markets, but also in emerging markets. Mills et al. (2000), examined the month of the year effect in stock market return of the Athens Stock Exchange general index for the period October 1986 to April 1997. The results showed significantly higher average return in January and lower return in April.

Kumari and Mahendra (2006), studied month of the year effect in the Indian Stock Market over a period from 1979 to 1998. They found that the returns in April were significant higher and different from the rest of the months. Lazer et al in their study on the Indian Stock Market from April 1991 to March 2005, analysed the monthly return data of the Bombay Stock Exchange’s sensitivity Index. Their results found that May, October and November have higher returns compared to other months and the maximum average return in April is also high and statistically significant, consistent with the tax-loss selling hypothesis. Pandey (2002) confirmed a tax-loss selling hypothesis in the Indian market explaining the presence of abnormal returns in April only to be contradicted later by various other studies. A recent study of Balaban (1995) investigated the month of the year

effect on the Turkish stock exchange. His analysis showed that January, June and September had significantly higher returns than other months.

However, Roll (1983) partly agreed with evidence of tax-loss selling hypothesis. He mentioned the fact that though sales would be higher in December to avoid tax paying , other investors would buy the stocks sold in anticipation of an eventual increase in January and this would eliminate the January effect.

Maghyereh (2003), using the standard GARCH model for Amman Stock Exchange (ASE) of Jordan found no evidence of monthly seasonality as well as January effect in the ASE returns. Giovanis (2009), examined fifty five stock markets and the January effect is rejected, as it is presented only in seven stock markets, while the most frequent significant higher monthly returns are reported in December of twelve stock markets.

Wong Ho, Dollery (2007) investigated the monthly effect in Malaysian stock market for period 1994-2006 by partitioning data in to 3 sub-periods. Their results revealed the existence of monthly effect in different periods. Bahadur and Joshi (2005) proved constant month of the year anomaly for Nepalese stock exchange for period 1995-2004. Chia'et al (2006) also conducted a study on Malaysian Stock Exchange and confirmed no January effect or any other monthly effect exists. Fountas and Segredakis (2002) investigated the month of the year effect in eighteen emerging equity markets over the period from January 1987 to December 1995. They observed that stock returns for January were significantly higher than the returns for the remaining eleven months only in Chile, Greece, Korea, Taiwan and Turkey. However, other empirical studies revealed the absence of the January effect.

The purpose of this paper is to investigate and test the January or the month of the year effect in the Colombo Stock Exchange and also to recognize other monthly patterns which can be used for the optimum asset allocation with result the maximization of profits.

3. Data and Methodology

Colombo Stock Exchange (CSE) is relatively a small but an active market with over 260 listed companies. CSE has two market indices, namely, All Share Price Index (ASPI) and Milanka Price Index (MPI). Data includes from 2nd January 2002 to 30th December 2011 (.....observations). Daily market return is calculated using the ASPI closing value.

To test whether the month of the year effect is present in the daily market returns of CSE the two regressions are estimated under OLS and GARCH.

OLS Model

$R_{it} = \alpha_1 D_{1t} + \alpha_2 D_{2t} + \ldots\ldots\ldots\ldots\ldots \alpha_{12} D_{12t} + \epsilon_t$

$\varepsilon_t \approx N(0,h_t)$

where;

R_{it} is the market return on day t

D_{1t} through D_{12t} are dummy variables for each month of the year such that $D_{1t}=1$, if day t falls in January and 0 otherwise; D_{2t} =, if the day t is in February and 0 otherwise and so on.

The coefficients α_1 through α_2 are the estimates of the mean returns for January to December respectively and ε_t is the random error term.

GARCH Model

Empirical studies on this phenomenon suggest that the assumption of homocedadaticity is normally violated in the context of financial time series. Thus the above model will be tested for ARCH effect. If the ARCH effect is present is the model, the following GARCH (1,1) model which allows the conditional variance to be dependent upon earlier own lags is used.

$R_{it} = \alpha_1 D_{1t} + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \alpha_5 D_{5t} + \epsilon_t$ (Conditional mean equation)

$\varepsilon_t \approx N(0,h_t)$

$h_t = \omega + \delta h_{t-1} + \gamma \varepsilon^2_{t-1}$ (Conditional variance equation)

where;

D_{1t} through D_{12t} are dummy variables for each month of the year such that D_{1t}=1, if day t falls in January and 0 otherwise; D_{2t} =, if the day t is in February and 0 otherwise and so on.

The coefficients α_1 through α_2 are the estimates of the mean returns for January to December respectively and ε_t is the random error term.

4. Results and Discussion

Table 1 provides the OLS regression results for the sample period. Under OLS method it is clear that coefficients of January, April and September are significant. Furthermore, F-Test (Wald Test) indicates that the monthly coefficients are not statistically equal leading to the conclusion that the month of the year effect is present in stock returns of the CSE. However, the problem is OLS estimates will not be accurate and can lead to wrong conclusion if the ARCH effect is present in the model. Thus, it is necessary to test the model for ACRH effect.

Table 01: OLS Model Results

Month	Coefficient	Standard Error	t-statistics	p-value
January	0.3223	0.0930	3.4654	0.0005*
February	0.1253	0.0966	1.2974	0.1946
March	-0.0368	0.0896	-0.4109	0.6812
April	0.2277	0.0974	2.3372	0.0195**
May	0.1721	0.0938	1.8353	0.0666
June	0.1468	0.0894	1.6429	0.1005
July	0.1287	0.0881	1.4606	0.1443
August	0.1161	0.0883	1.3041	0.1889
September	0.3869	0.0900	4.2982	0.0000*
October	-0.0290	0.0896	-0.3236	0.7463
November	-0.1777	0.0916	-1.9403	0.0525
December	-0.1112	0.0963	-1.1546	0.2484

Note:

* Significant at 1% level

**significant at 5% level

A Lagrange multiplier (LM) test is used to test for the presence of ARCH effect. For this purpose residuals obtained from OLS results are used. Then the following regression is estimated to test for ARCH effect.

$$e^2_t = \gamma_0 + \gamma_1 e^2_{t-1} + v_t$$

where;

e is residuals and v is a random error term.

The results of the LM test are presented in Table 02. The ARCH effect has been tested with five lag terms.

Table 02: LM Test Results

Variable	Coefficient	t-value	p-value
Constant	0.8739	6.2695	0.0000
e^2_{t-1}	0.1289	6.2590	0.0000
e^2_{t-2}	0.3342	16.1360	0.0000
e^2_{t-3}	0.0371	1.7001	0.0891
e^2_{t-4}	-0.0727	-3.5096	0.0005
e^2_{t-5}	0.0442	2.1431	0.0322
F-statistics	81.1022	p-value (F)	0.0000
Chi square-Statistics	346.8027	p-value (Chi square)	0.0000

The LM test results suggest that the ARCH effect is present in the model. As a result, OLS model will not be an appropriate model. Therefore, most appropriate model is GARCH as it captures the time-varying volatility. Table 3 shows the results obtained under GARCH method.

Table 03: GARCH Model Results

Month	Coefficient	Standard Error	z-statistics	p-value
Conditional Mean Equation				
January	0.2638	0.0614	4.2932	0.0000*
February	0.1980	0.0591	3.3492	0.0008*
March	0.0081	0.0641	0.1259	0.8998
April	0.1844	0.0380	4.8546	0.0000*
May	0.0739	0.0676	1.0937	0.2741
June	0.0523	0.0712	0.7345	0.4627
July	0.1087	0.0543	2.0023	0.0453
August	0.0986	0.0669	1.1431	0.1407
September	0.3047	0.0629	4.8452	0.0000*
October	0.0984	0.0705	1.3966	0.1625
November	0.0708	0.0635	1.1158	0.2645
December	0.0335	0.0706	1.1158	0.6352
Conditional Variance Equation				
ω	0.0966	0.0076	12.7124	0.0000*
ε^2_{t-1}	0.3156	0.0179	17.6017	0.0000*
h_{t-1}	0.6619	0.0127	51.9684	0.0000*

Note:

*significant at 1% level.

GARCH model results reveal that coefficients of January, February, April and September are significant at 1% level. In other words, daily returns of January, February, April and September are significantly higher than the daily returns of other months. F-test or Wald Test results indicate that the coefficients of all months of the year

are not statically equal and it is significant at 1% level. This means that the month of the year effect is present in the stock returns of CSE. Moreover, the investors can trade on past information or they are in a position to predict the nature of stock prices based on the past information. By trading on this past information they can earn abnormal returns.

4. Conclusion

The purpose of this paper was to examine whether the month of the year effect is present in the stock returns of CSE. Results were obtained under OLS and GACRH methods. It can be concluded that the month of the year effect is present in the daily returns of the stocks traded in CSE and there is sufficient evidence to arrive at this conclusion. Daily mean returns are significantly higher in January, February, April and September. As investors in CSE can earn abnormal return by trading on past information, CSE is not weak-form efficient.

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