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Turn of The Month Effect: Evidence From The Nairobi Securities Exchange

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This study sought to investigate if Turn of the Month effect exists at the Nairobi Securities Exchange. In carrying out the study, the days of the month were divided into two, the Turn of the Month (TOM) which included the last trading day of the month and the first three trading days of the following month. The other trading days of the month were categorized as Rest of the Month (ROM). The 20 share index was used as the sampling frame and the daily indices were used to compute the daily returns. Secondary data was obtained from the Nairobi Securities Exchange data base. The TOM coefficient was not significant to confirm TOM effect. It is therefore concluded that there is no TOM effect at the Nairobi Securities Exchange. To practice, the study will give vital information to brokerage firms as they will advise their clients on the best time of the month to sell or buy securities. The findings of the study will also be of benefit to policy formulation aimed at improving capital market efficiency.

Keywords: Turn of the Month, Rest of the Month, Twenty Share Index, Market Efficiency and Nairobi Securities Exchange.

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Introduction

It was Fama (1970) who defined an efficient market as a market which adjusts rapidly to new information. He categorized the capital market in to three different forms of efficiencies namely, the weak form, the semi-strong form and the strong form efficiencies. Rubinstein (1975) extended the definition of market efficiency. He said that the market is efficient with regard to an informational event if the information causes no portfolio changes. Kennedy (1996) added that, markets in the developing and less developed countries are not efficient in semi-strong or strong form but in the weak form.

There has been criticism to the efficient Market Hypothesis that has generated concern. Grossman and Stiglitz (1980) argue that perfectly information efficient markets are impossible, for if markets are perfectly efficient, the return to gathering information is nil, in which case there would be little reason to trade and markets would eventually collapse. Campbell, Lo and MacKinlay (1997) share the same opinion. They are in favour of the notion of relative efficiency, that is, the efficiency of one market measured against another.

Lo and MacKinlay (1999) argue that Efficient Market Hypothesis, by itself, is not a well-defined and empirically refutable hypothesis. To make it operational, one must specify additional structure, including investors' preferences, information structure and business conditions. But then a test of the Efficient Markets Hypothesis becomes a test of several auxiliary hypotheses as well, and a rejection of such a joint hypothesis tells us little about which aspect of the joint hypothesis is inconsistent with the data. The Bad Model problem advanced by Fama (1991) suggests that Efficiency per se is not testable. That it must be tested jointly with some model of equilibrium. Financial anomalies have been advanced in the EMH theory. A financial anomaly refers to unexplained results that deviate from those expected under the financial theory. Financial anomalies that have been identified under the EMH include, Low Price Earnings Effect, low priced stocks, the small firm effect, the neglected firm effect and Market overreaction. Others are the Turn of the calendar anomalies which include The January effect, the day of the week effect, the turn of the month effect, the turn of the year effect among others. The study narrows down to turn of the month effect and will seek to establish if it exists at the Nairobi Securities Exchange.

Turn of the Month Effect

A turn-of-the-month effect is documented by Ariel (1987) where higher mean stock returns occur during the initial days of a trading month than during days later in the month. Ariel (1987) was the first to identify this anomaly in US stock prices at the beginning of one month and end of the other month. He studied this effect by considering last day of one month and the first three days of upcoming month. Changes in stock prices in these days are found positive.

Zafar, Shah and Urooj (2009) observe that different studies have given different conclusions for on TOM effect. Cadsby (1989) carried a study which confirmed that the turn-of-the-month effect is present in both US and Canada. Further researches were carried out by Cadsby and

Ratner (1992) and the results suggest that the anomaly has shown its presence in the US, Canada, the UK, West Germany, Switzerland and Australia but not in Japan, France, Italy and Hong Kong.

Methods

The study employed an analytical research design. The design was preferred due to the fact that the study entailed analyzing returns during the TOM and ROM windows to establish the window with the highest return and so confirm if TOM effect exists or not. For purposes of this study the population consisted of all active firms listed at the NSE for equity trading as at December 2011. The study used the NSE 20 share index. Secondary data from the NSE database was used for years ranging from 2002 to 2011. The regression model below was used to determine TOM effect:

$R_t = \beta_0+\beta_1 d_{2t}+\varepsilon_t$

Where:

R_t = Daily return of stock index

β_0 = is the coefficient of ROM

β_1 = is the difference in the computed mean returns of TOM

d_{2t} = Dummy variable for the TOM returns

ε_t = Error term

Results And Discussions

Table 1: **Regression coefficients for TOM effect for individual years from 2002 to 2011**

(t-values are in parenthesis)

Periods	β_0	β_1	R	P-value
2002	-0.035 (-0.606)	0.193 (1.469)	0.009	0.143
2003	0.252 (3.124)	0.397 (0.790)	0.003	0.4 30
2004	0.77 (1.466)	-0.175 (-2.095)	0.17	0.0 37
2005	0.116 (3.007)	0.136 (0.239)	0.000	0.8 11
2006	0.144 (0.101)	0.138 (-0.002)	0.000	0.9 99
2007	-0.035 (3.124)	0.068 (0.631)	0.002	0.529
2008	-0.327 (-3.002)	0.462 (3.178)	0.039	0.002
2009	-0.026 (-0.376)	0.058 (-0.2020	0.000	0.840
2010	0.123 (2.713)	0.123 (0.013)	0.000	0.989
2011	0.220 (40.20)	0.243 (1.868)	0.10	0.063
2002-2011	0.510 (0.359)	0.150 (0.304)	0.000	0.761

Source: Research data

The model regression results in table 1 above have shown the coefficient TOM β_1 to be insignificant except for two years 2004 and 2008. In year 2008, TOM coefficient is negatively significant with β_1 = -0.175, P-value = 0.037 which is less than 0.05 and t-value = -2.095. In year 2008 TOM is positively significant with β_1 = 0.462 where P-value is less than 0.5, that is 0.002 < 0.5 with t-value of 3.178. TOM coefficient for the whole period of ten years is also insignificant thus failing to demonstrate TOM effect at the NSE.

Table 2: Year 2002 Model Summary

Model		R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
						R Square Change	F Change	df1	df2	Sig. F Change
dimension0	1	.093[a]	.009	.005	.81029	.009	2.159	1	246	.143
a. Predictors: (Constant), Days of the month										

Source: Research data

The coefficient of determination (R^2) equals 0.009. This shows that days of the month explain 0.9 percent of the total variation of Daily return of stock index leaving only 99.1 percent unexplained. The P- value of 0.143 implies that the model of Daily return of stock index is not significant at the 5 percent significance level.

Table 3: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.418	1	1.418	2.159	.143[a]
	Residual	161.516	246	.657		
	Total	162.934	247			
a. Predictors: (Constant), Days of the month						
b. Dependent Variable: Daily return of stock index						

Source: Research data

The P- value of 0.143 implies that there is no linear regression relationship between days of the month and the Daily return of stock index at 5 percent significance level. That is, the Daily return of stock index in the year 2002 during ROM (zero value of x) was -0.035 and the Daily return of stock index was expected to increase at the rate of 0.193 during TOM (value of x equal 1). The P- value of 0.143 > 0.05 implies that, Days of the month as an independent variable is not significant at the 5 percent. TOM coefficient (0.228) is higher than ROM coefficient (-0.035) but not significant to confirm TOM effect in year 2002.

Table 4: Year 2003 Model Summary

Model		R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
						R Square Change	F Change	df1	df2	Sig. F Change
dimension0	1	.050[a]	.003	-.002	1.14430	.003	.624	1	247	.430
a. Predictors: (Constant), Days of the month										

Source: Research data

In table 4 above the coefficient of determination (R^2) equals 0.003. This shows that days of the month explain 0.3 percent of the total variation of Daily return of stock index leaving only 99.7 percent unexplained. The P- value of 0.43 implies that the model of Daily return of stock index is not significant at the 5 percent significance level.

Table 5: ANOVA

Model		Sum of Squares	Df	Mean Square	F	P-value
1	Regression	.817	1	.817	.624	.430[a]
	Residual	323.425	247	1.309		
	Total	324.242	248			
a. Predictors: (Constant), Days of the month						

Source: Research data

The P- value of 0.43 in fig. 4.3.2C above implies that there is no linear regression relationship between days of the month and the Daily return of stock index in year 2003 at 5 percent significance level. That is, the Daily return of stock index in the year 2003 during ROM (zero value of x) was 0.252 and the Daily return of stock index was expected to increase at the rate of 0.145 during TOM (value of x equal 1). The P- value of 0.43 > 0.05 implies that, Days of the month as an independent variable is not significant at 5 percent. Though the TOM coefficient is more than ROM coefficient, it is not significant to confirm existence of TOM effect at NSE for year 2003.

Table 6: Year 2004 Model Summary

Model		R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
						R Square Change	F Change	df1	df2	Sig. F Change
dimension0	1	.131[a]	.017	.013	.74965	.017	4.391	1	251	.037
a. Predictors: (Constant), Days of the month										

Source: Research data

The coefficient of determination (R^2) in table 11 equals 0.017. This shows that days of the month explain 1.7 percent of the total variation of Daily return of stock index leaving only 98.3 percent unexplained. The P- value of 0.037 implies that the model of Daily return of stock index is not significant at the 5 percent significance level.

Table 7: ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2.468	1	2.468	4.391	.037[a]
	Residual	141.057	251	.562		
	Total	143.525	252			
a. Predictors: (Constant), Days of the month						
b. Dependent Variable: Daily return of stock index						

The P- value of 0.37 implies that there is no linear regression relationship between days of the month and the Daily return of stock index at 5 percent significance level.

Table 8: Year 2005 Model summary

Model		R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
						R Square Change	F Change	df1	df2	Sig. F Change
dimension0	1	.015[a]	.000	-.004	.54664	.000	.057	1	246	.811
a. Predictors: (Constant), Days of the month										

The coefficient of determination (R^2) equals 0.000. This shows that days of the month do not explain any variation of Daily return of stock index but determined by other factors. The P- value of 0.811 implies that the model of Daily return of stock index is not significant at the 5 percent significance level.

Table 9: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.017	1	.017	.057	.811[a]
	Residual	73.507	246	.299		
	Total	73.524	247			
a. Predictors: (Constant), Days of the month						
b. Dependent Variable: Daily return of stock index						

Source: Research data

The P- value of 0.811 implies that there is no linear regression relationship between days of the month and the Daily return of stock index at 5 percent significance level.

Table 10: Year 2006 Model Summary

Model		R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
						R Square Change	F Change	df1	df2	Sig. F Change
dimension0	1	.000[a]	.000	-.004	20.17648	.000	.000	1	244	.999
a. Predictors: (Constant), Days of the month										

Source: Research data

The coefficient of determination (R^2) equals 0.000. This shows that days of the month do not explain any variation of Daily return of the stock index. The P-value of 0.999 implies that the model of Daily return of stock index is insignificant at the 5 percent significance level.

Table 11: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.001	1	.001	.000	.999[a]
	Residual	99330.000	244	407.090		
	Total	99330.002	245			
a. Predictors: (Constant), Days of the month						
b. Dependent Variable: Daily return of stock index						

Source: Research data

Table 12: Year 2007 Model Summary

Model		R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
						R Square Change	F Change	df1	df2	Sig. F Change
dimension0	1	.040[a]	.002	-.002	1.01766	.002	.398	1	246	.529
a. Predictors: (Constant), Days of the month										

Source: Research data

The coefficient of determination (R^2) equals 0.002. This shows that days of the month only explain 0.2% of the total variation of Daily return of the stock index leaving 99.8% unexplained. The P- value of 0.529 implies that the model of Daily return of stock index is not significant at the 5 percent significance level.

Table 13: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.412	1	.412	.398	.529[a]
	Residual	254.763	246	1.036		
	Total	255.176	247			
a. Predictors: (Constant), Days of the month						
b. Dependent Variable: Daily return of stock index						

Source: Research data

The P- value of 0.529 implies that there is no linear regression relationship between days of the month and the Daily return of stock index at 5 percent significance level
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Table 14: Year 2008 Model Summary

Model		R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
						R Square Change	F Change	df1	df2	Sig. F Change
dimension0	1	.198[a]	.039	.035	1.54444	.039	10.100	1	247	.002
a. Predictors: (Constant), Days of the month										

Source: Research data

The coefficient of determination (R^2) equals 0.039. This shows that days of the month only explain 3.9% of the total variation of Daily return of the stock index leaving 96.1% unexplained. The P- value of 0.002 implies that the model of Daily return of stock index is not significant at the 5 percent significance level.

Table 15: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	24.091	1	24.091	10.100	.002[a]
	Residual	589.165	247	2.385		
	Total	613.256	248			
a. Predictors: (Constant), Days of the month						
b. Dependent Variable: Daily return of stock index						

Source: Research data

The P- value of 0.002 implies that there is no linear regression relationship between days of the month and the Daily return of stock index at 5 percent significance level.

Table 16: Year 2009 Model Summary

Model		R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
						R Square Change	F Change	df1	df2	Sig. F Change
dimension0	1	.013[a]	.000	-.004	.98878	.000	.041	1	250	.840
a. Predictors: (Constant), Days of the month										

Source: Research data

The coefficient of determination (R^2) equals 0.000. This shows that days of the month do not explain any variation of the Daily return of the stock index. The P-value of 0.840 implies that the model of Daily return of stock index is significant at the 5 percent significance level.

Table 17: ANOVA

ANOVA[b]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.040	1	.040	.041	.840[a]
	Residual	244.421	250	.978		
	Total	244.461	251			
a. Predictors: (Constant), Days of the month						
b. Dependent Variable: Daily return of stock index						

Source: Research data

The P- value of 0.840 implies that there is a linear regression relationship between days of the month and the Daily return of stock index at 5 percent significance level.

Table 18: Year 2010 Model Summary

Model		R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
						R Square Change	F Change	df1	df2	Sig. F Change
dimension0	1	.001[a]	.000	-.004	.64761	.000	.000	1	251	.989
a. Predictors: (Constant), Days of the month										

Source: Research data

The coefficient of determination (R^2) equals 0.000. This shows that days of the month do not explain any variation of the Daily return of the stock index. The P-value of 0.989 implies that the model of Daily return of stock index is significant at the 5 percent significance level.

Table 19: ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.000	1	.000	.000	.989[a]
	Residual	105.269	251	.419		
	Total	105.269	252			
a. Predictors: (Constant), Days of the month						
b. Dependent Variable: Daily return of stock index						

Source: Research data

The P- value of 0.989 implies that there is a linear regression relationship between days of the month and the Daily return of stock index at 5 percent significance level.

Table 20: Year 2011 Model Summary

Model		R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
						R Square Change	F Change	df1	df2	Sig. F Change
dimension0	1	.118[a]	.014	.010	.07776	.014	3.490	1	248	.063
a. Predictors: (Constant), Days of the month										

Source: Research data

The coefficient of determination (R^2) equals 0.014. This shows that days of the month explain only 1.4 percent of total variation of the Daily return of the stock index leaving 98.6 percent to be explained by other factors. The P- value of 0.063 implies that the model of Daily return of stock index is not significant at the 5 percent significance level.

Table 21: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.021	1	.021	3.490	.063[a]
	Residual	1.499	248	.006		
	Total	1.521	249			
a. Predictors: (Constant), Days of the month						
b. Dependent Variable: Daily return of stock index						

Source: Research data

The P- value of 0.063 implies that there no linear regression relationship between days of the month and the Daily return of stock index at 5 percent significance level.

Conclusion

The study did not find evidence to confirm that TOM effect exists at NSE. The study was conducted by dividing the month in to two parts, the TOM and the ROM. Daily returns for both TOM and ROM were computed from the daily indices of the NSE 20 share index. In all the years, TOM coefficients were insignificant as was the

overall TOM coefficient as shown in table 1. Though TOM mean returns were higher than ROM returns in most of the years as shown in table 2, the regression analysis did not produce significant TOM coefficient to conclude that TOM effect exists at the NSE. In all the ANOVA tables above, p-values are less than 0.05 indicating that the TOM coefficient is insignificant. Besides the p-value being less than 0.05, looking at the correlation analysis in table 1, it can be noted that all correlations for all the years are less than 0.7. This shows that the model is inadequate to explain the variations in securities returns.

The existence of TOM effect at the NSE could have been an indicator that the capital market is not efficient. In conclusion therefore, it can be stated that no TOM effect was established at the NSE. This may be an indication that NSE efficiency is improving. However, other factors like the size of the index may have contributed to the results. The returns in TOM are slightly more than the return in ROM but not significant. This means that traders cannot post higher returns by trading during the TOM days. This is different from results of previous studies conducted in the developed world. Kenya being a developing country, may present a scenario that may be the case for the developing nations security markets.

Implication on Policy and Practice

The academia will find the study as a spring board for further studies. The results may be incorporated in future studies as reference work. Further, various studies have been done at the NSE but less on TOM. This study will therefore bridge this knowledge gap. The results of this study will be of benefit to the NSE and the CMA as a basis for policy formulation aimed at improving capital market efficiency. TOM as an anomaly to the EMH is not desirable if the market is efficient and so the need for market regulators to develop policies that improve market efficiency.

Finally, the results of this study are likely to lend vital information to the brokerage firms as critical advisors to investors. They will be able to advise their clients on the best time of the month to sell or buy securities. Further, Investors shall find the results of the study useful as a guide on the best time to invest or divest their securities. The results of a TOM effect study shall appeal to institutional investors concerned with the timing of purchases and sales of securities in the stock market.

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