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Calendar Anomalies in the Kenyan Stock Exchange

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Abstract

This research investigates two major calendar anomalies, the day of the week effect and the holiday effect, in the Nairobi Stock Exchange (NSE), a leading African exchange. By studying eight of the exchange's most representative stock indices over a twenty-year period from 2000 to 2019, this research is the first to test and compare the presence of major calendar anomalies on the NSE before and after the 2008 financial crisis. The findings suggest that there is a significant and negative return on Mondays, while a positive return is observed on Fridays. More importantly, these patterns emerged only after the occurrence of the 2008 financial crisis. In addition, we find a strong and positive pre-holiday return effect for large cap stocks with high levels of liquidity. The increasing significance of both anomalies during the post-crisis era aligns with the ongoing trend of growing foreign capital inflows from the UK and other European nations into Kenya since 2008. Our results shed some light on the degree of market efficiency in one of the major emerging capital markets in Africa, and its increasingly close relationship with the global capital market.

Keywords: Day of the Week Effect, Holiday Effect, Nairobi Securities Exchange, Financial Crisis

JEL classification: G01, G4, G10, G11.

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1. Introduction

The Nairobi Securities Exchange (NSE) is a leading African Exchange, based in Kenya. Until the COVID-19 pandemic, Kenya was one of the fastest-growing economies in Africa, with an annual average GDP growth of 5.9% between 2010 and 2018. Kenya has successfully established a diverse and dynamic economy and reached lower-middle income status, and serves, for foreign investors, as the entry point to the larger East-African market.

It is well known that the development of financial markets can help innovation and economic growth. Stock exchanges, with their role of efficiently directing the flow of savings and investment in the economy, play a pivotal role in supporting the companies and economies of developing countries. The Efficient Market Hypothesis (EMH) states that, for a stock market to be efficient even in its weak form, stock prices should follow a random walk and thus unpredictable (Fama, 1965, 1970, 1995). Consistent with EMH, some studies find that emerging market returns are not autocorrelated (Kim and Singal, 2000; Fuss, 2005). However, some others have found evidence of non-random

stock price behavior, rejecting the EMH (Harey, 1994; Claessens et al., 1995; Poshakwale, 1996; Khababa, 1998, Obalade and Muzindutsi, 2019). Therefore, it is important for researchers, investors, and regulators to keep monitoring the efficiency of the NSE, which was founded in 1954 and has a six-decade history in listing equity and debt securities. The NSE plays a vital role in the growth of Kenya's economy by encouraging savings and investment, as well as helping local and international companies access cost-effective capital. Since the NSE began allowing foreign investment in 1995, the volume of capital inflows to the NSE has grown substantially. Partly attributed to renewed investor confidence, the foreign capital inflow started to increase significantly in 2009. After the 2008 financial crisis, trading volume on the NSE increased from 5.7 billion shares in 2011 to 7.6 billion shares in 2013, a 33% increase in two short years. More significantly, in the same time span, the NSE trading value increased 100%.

Among the widely observed market anomalies that have been documented in the literature, two anomalies that have significant impacts on market efficiency are the weekday effect and the holiday effect. In the past, they have been investigated in many different countries' financial markets.

i. The Day of the Week Effect

The day of the week effect is a common anomaly observed in financial markets. It refers to the tendency of stocks to show a pattern of abnormally high or low returns on different days of the week (Cross, 1973; French 1980; Keim and Stambaugh, 1984; Rogalski, 1984). Many existing studies suggest that Monday returns are predictably negative and significantly lower than average (Gibbons and Hess, 1981; Jaffe and Westerfield, 1985; Solnik and Bousquet, 1990; Siegel, 1998; Zhang et al., 2017). Keim and Stambaugh (1984) tested and denied the measurement error hypothesis and a specialist related bias. While Monday average returns are typically negative, Friday returns are found to be significantly positive and higher than average daily returns by many studies (Lakonishok and Smidt, 1988; Chiah and Zhong, 2019).

In many existing calendar anomaly studies on African stock exchanges, results are also mixed. Alagidede (2008) found significant day of the week effect in Zimbabwe, Nigeria and South Africa, but not in Egypt, Kenya, Morocco and Tunisia. Du Toit et al. (2018) found significant Monday and Friday effect in the Johannesburg Stock Exchange (JSE). However, Onuko and Ondabu (2021) used EGARCH(1,1) model to analyze the NSE 20 Share Index and found no effect of the day of the week anomaly. Significant effects are also found on days other than Monday and Friday. Derbali and Hallara (2016) found significant and positive effects only on Thursdays in the Tunisian stock exchange (TUNINDEX). Ferrouhi et al. (2021) found no Monday effect but positive Friday returns in the NSE, by sampling the NSE All Share Index from 2009 to 2019.

Previous studies suggest various possible causes of the day of the week effect; these include a tendency for firms to delay the announcement of negative news until the weekend to avoid market disruption (French, 1980), the fact that retail investors usually trade on Monday due to their needs for time to process information during weekends (Miller, 1998) or the less optimistic feelings of investors on Mondays (Rystrom and Benson, 1989). The possible impact from individual investors is also confirmed by several other studies, showing that the number of small size trades initiated by individual investors are significantly higher on Mondays (Brooks and Kim, 1997; Abraham and Ikenberry, 1994; Lakonishok and Maberly, 1990). These findings collectively suggest that individual investors may play a role in contributing to the negative Monday effect. The trading behavior of short sellers may also be a possible cause of the day of the week effect. Chen and Singal (2003) suggest that speculative short sellers tend to close their open position prior to the weekend. However, short selling should not be impactful in this study, since it was not allowed in the NSE until January 2018. We test with pre-2018 data and find no significant difference in results.

On a few occasions, anomalies have disappeared after the publication of research study (Dimson and Marsh, 1999). According to some academics, however, this had not happened. Instead, the day

of the week pattern shift to other weekdays. For example, Kamara (1997) found a positive Monday return for the S&P 500 and attributed that shift to the transaction cost reduction that facilitated arbitrage against the Monday effect. Brusa, Liu and Schulman (2000) found positive Monday returns and negative Friday returns. This reversal has also been documented in other countries (Board and Sutcliffe, 1988; Steeley, 2001). For example, Steely (2001) discovered the day of the week effects in the UK stock market, which can be explained by a systematic pattern of market-wide news arrivals into the UK stock market.

Beside Monday and Friday, the weekday anomaly has also been identified on other weekdays (Jaffe and Westerfield, 1985; Aggarwal and Rivoli, 1989; Chang, Pinegar and Ravichandran, 1993; Dubois and Louvet, 1996; Tong, 2000; Zhang et al., 2017). For example, several studies found the most significant negative returns in a week were found on Tuesday, not Monday, for Japan and Australia (Pettway and Tapley, 1984; Jaffe and Westerfield, 1985). Further evidence includes significantly negative Monday (The UK indices) or Tuesday (French indices) returns. For instance, Condoyanni, O'Hanlon, and Ward (1987) suggested that the French index's negative Tuesday return was due to its compilation before the US market opened. Aggarwal and Rivoli (1989) also suggested a strong "Tuesday effect" in equity returns within four emerging markets: Hong Kong, Singapore, Malaysia, and the Philippines, may be due to the "spillover effect" emanating from the New York stock markets. In summary, the deviations are widely recognized as a flow-through of the day of the week effect from major financial markets, notably the United States or the United Kingdom, to these respective markets.

ii. Holiday Effect

The holiday anomaly has been widely investigated in numerous equity markets. Significantly higher stock returns were found in the U.S stock market prior to holidays (Lakonishok and Smidt, 1988; Ariel, 1990), and post-holidays (Fabozzi, Ma, and Briley, 1994). These results were also supported by more recent studies on the US equity market (Sullivan, Timmermann, and White, 2001; Abadir and Spierdijk, 2005). Cadsby and Ratner (1992) found that pre-holiday effects are significant in Canada, Japan, Hong Kong, and Australia, despite variations in holidays and institutional arrangements among these countries. Kim and Park (1994) similarly identified significant holiday effect in the U.K. and Japanese stock markets. Tan and Wong (1996) demonstrated that stock returns are significantly higher on pre-holidays than on other trading days in the Singapore market. Moreover, Arsad and Coutts (1997) discovered significant holiday effects in the Financial Times Industrial Ordinary Shares Index over a period from 1935 to 1994. Menue and Pardo (2004) presented results indicating unusually high abnormal pre-holiday returns in the Frankfurt Stock Exchange, unrelated to any calendar anomaly. Hansen, Lunde, and Nason (2005) revealed significant calendar effects on returns within most of these equity markets. Alagidede (2013) found high and significant pre-holiday returns in South Africa. However, the author also argued that the presence of illiquidity and transaction costs effectively eliminate any potential arbitrage opportunities associated with these returns.

Marrett and Worthington (2007) focused on the Australian market and found a significant preholiday effect specifically among small-cap stocks, but no post-holiday effect. On a similar note, Blandon (2010) examined the LATIBEX market and did not find any significant holiday effects. Taken together, these studies highlight the presence and significance of holiday effects, particularly pre-holiday effects, in various stock markets across different countries.

One popular explanation for the pre-holiday effect is that holidays affect a human trader's mood (optimistic vs pessimistic) and attitude (aggressive vs conservative) (Hirshleifer and Shumway, 2003; Yuan, Zheng, and Zhu, 2006). Other researchers suggest that this anomaly may be due to cultural effects in Asian stock exchanges (Chan, Khanthavit, and Thomas, 1996; Cadsby and Ratner, 1992; Yen and Shyy, 1993).

Like the weekday anomaly, holiday anomalies in some countries disappeared after publications on

this behavior. Chong, Hudson, and Keasey (2005) conducted research indicating that the pre-holiday effect was no longer evident in the U.K. and Hong Kong markets. Similarly, Marquering, Nisser, and Valla (2006) observed the disappearance of the holiday effect subsequent to the publication of this anomaly. Furthermore, Wong, Agarwal, and Wong (2006) conducted a study that revealed a substantial reduction of the holiday anomaly in the Singapore stock market. Holden, Thompson, and Ruangrit (2005) conducted an analysis of the day-of-the-week effect and holiday effect, and suggested that significant transformations in these anomalies can be attributed to major economic events, particularly financial crises. Their research sheds light on the intricate relationship between macroeconomic events and the manifestation of market anomalies.

iii. Nairobi Security Exchange and Foreign Investment

Many researchers have studied relationship between foreign capital inflow and securities exchange efficiency in emerging markets. Kim and Singal (2000) studied the impact of market opening in emerging markets and found that foreign capital inflow benefits the market efficiency. Obeng-Odoom (2020) also suggested that financial support is clearly needed in addressing social inequality and poverty. Arshad et al. (2016) found improving market efficiency after the global economic crisis, with large inflow of Foreign Direct Investment (FDI). As shown in a 2015 study by Adam and Gyamfi, African stock markets have emerged as strong candidates for international portfolio diversification (Adam and Gyamfi, 2015). This integration has led to the gradual development of African equity markets, positioning them as appealing destinations for foreign investment (Boako and Alagidede, 2018). Narayan et al. (2015) conducted a study that revealed the presence of noteworthy seasonal inefficiencies in the South African Rand (ZAR) against the US Dollar (USD) FX market. Importantly, these inefficiencies were found to be maximized during the global financial crisis period.

Ochenge, Ngugi, and Muriu, (2020) found that foreign equity inflows have promoted liquidity in the NSE. However, Osoro et al. (2020) found that increased foreign direct investments leads to a decline in market value of the NSE in the long run, and suggested that the NSE authority needs to improve its foreign investment policy.

This paper is the first to investigate two major calendar anomalies, namely the day of the week effect and holiday effect, in both the pre- and post-2008 financial crisis periods, within the Nairobi Stock Exchange. Research in the NSE is important and unique in many aspects. Several studies have described the unique characteristics of the NSE (King and Botha, 2015; Ndirangu, Ouma, and Munyaka, 2014; Abeysekera, 2010; Asongu, 2011; Muhia and Kuso, 2019). King and Botha (2015) found that the NSE demonstrates relatively low correlation with the Johannesburg Stock Exchange (ISE), the largest securities exchange in Africa. Consequently, it offers substantial diversification benefits to investors. In a study by Ndirangu et al. (2014), it was discovered that the Kenyan equity market demonstrated a notable trend of over-subscriptions during Initial Public Offerings (IPOs) in the period following the 2008 financial crisis. This finding suggests a heightened investor interest and demand for IPOs within the Kenyan market during that post-crisis period. Additionally, Asongu (2011) investigated the Kenyan stock market and identified instances of international financial market transmissions during financial crises. Moreover, the results of the study affirmed the growing integration of African financial markets. These findings provide valuable insights into the interconnectedness of financial markets, both at a global level and within the African context, underscoring the significance of international factors in the Kenyan stock market.

The NSE had previously operated under tight capital controls. In the pre-financial crisis era, even after the financial liberalization in 1995 that allows foreign capital investment in the NSE, the foreign capital inflow increase was disrupted in the years 1997 and 2008, partly attributed to the uncertain political environment. However, foreign direct investment in Kenya has increased significantly since 2009. As Figure 1 shows, after the 2008 financial crisis, foreign direct investment into Kenya has increased rapidly. Furthermore, investors from the United Kingdom are, the largest

source of foreign capital that had flowed into Kenya . Condoyanni et al. (1987) states that the day of the week effect is a pervasive feature of capital markets around the world. They found clear evidence that time-zones set bounds on the speed of reaction of general stock indices. Therefore, if the capital flow effect exists, we should expect 1) a negative Tuesday effect ; and 2) the day of the week effect to become more significant after the 2008 financial crisis.

In this paper, our data sample spanning a long period from 2000 to 2019, enables us to investigate the calendar anomalies before and after the inception of global financial crisis. We use daily values of the eight largest indices and sectors from the NSE, in our attempt to identify the calendar effects.

The remainder of the paper is organized as follows: Section II describes the data sample and methods. Section III presents and discusses the empirical results. Finally, we summarize the findings in last section.

2. Data and Methodology

In line with previous studies, daily market returns of the major stock market indices were computed and categorized based the occurrence of the global financial crisis in 2008. The global financial crisis splits the full sample into two groups by Sept. 15th, 2008, when the bankruptcy of Lehman Brothers was announced.

We calculate the returns of the indices using the formula:

$$R_t = Log(P_t) - Log(P_{t-1})$$

where

- Rt is the return on the day t;
- Pt is the closing market index price on the day t.

i. The Day of the Week Effect

Following most existing studies, we test the day of the week effects by estimating the following OLS regression model with dummy variables:

$$R_t = \beta_1 Mon_t + \beta_2 Tue_t + \beta_3 Wed_t + \beta_4 Thu_t + \beta_5 Fri_t + e_t$$

where

- Rt is the index return on day t;
- Weekday variables (Mont, Tuet, etc.) are dummy variables, which equal one for each weekday (Monday, Tuesday, etc.) and zero otherwise;

If the NSE exhibits a capital flow effect from negative Monday returns in the UK market, then the estimated coefficient 2 is expected to be negative and statistically significant.

ii. Holiday Effect

We test pre- and post-holiday effects by forming the OLS regression model with dummy variables:

$$Rt = \alpha + \beta_1 Pre_Holiday + \beta_2 Post_Holiday$$

where

- *Pre_Holiday* is a dummy variable which equals one for the last trading day before a public holiday and zero otherwise;
- *Post_Holiday* is a dummy variable which equals one for the first trading day after a public holiday and zero otherwise.

Our study includes data for the most representative broad market stock index (NSE All Share), a large-cap market index (NSE20), and six major sector indices in the NSE, as shown in the Table I. Our sample provides a comprehensive coverage of stocks traded on the NSE. NSE All Share Index covers all listed firms in the NSE. NSE 20 Index covers the twenty largest stocks in the NSE. It should be noted that NSE20 also has the best data availability among all indices, ranging from January 2000 to the end of 2019. We also include the six major NSE sectors, including insurance, energy, investment, construction, manufacture, and commercial sectors.

All data are collected from the Bloomberg financial database. The sample periods start from the first trading day of 2000, or the inception date of the index, and end on the last trading day of 2019.

3. Testing Calendar Anomalies

i. The Day of the Week Effect

Table II Presents descriptive statistics for the index returns. The Kruskal–Wallis (K-W) test suggests Monday returns are different than other days. This difference is statistically significant at 1% level for the large cap stocks in the NSE 20 Index, and at 5% level for the NSE All Share Index. The test results indicate possible presence of seasonality for both major broad market indices and four out of six sectors.

Table III reports the full sample regression results. Both the NSE All Share Index and the NSE 20 Index show the lowest negative returns on Monday. The strong negative effect is consistent with the K-W test results in Table II, where both indices' Monday means are significantly negative. In addition, for both major indices, the mean returns are all significantly positive on Fridays. This positive Friday effect also shows stronger statistical significance for the large-cap NSE 20 Index (1%) than the NSE All Share Index (5%).

While not found with the NSE All Share Index sample, the Tuesday effect is negative and statistically strong (1%) with the large-cap NSE 20 Index sample. This finding is consistent with previous studies showing negative Tuesday effect in Japan and Australia. This may indicate a capital flow effect from other major stock exchanges such as LSE that closes a few hours later than the NSE. The spillover effect, due to global capital flow has been found and supported by many previous studies (Jaffe and Westerfield, 1985; Condoyanni, O'Hanlon, and Ward, 1987; Kato, 1990). Also consistent with the fact that large-cap stocks attract most foreign capital flow, this effect disappears for middle and small-cap indices in the NSE. In addition, the large-cap NSE 20 Index exhibits a negative Thursday effect. A search for possible explanations of this strong Thursday negative effect points to the Friday settlement effect, which causes investors to sell on Thursdays before index futures' settlement on Fridays (Bildik, 2001). For middle and small cap indices, this effect loses its statistical significance or economic magnitude. There is no consistent significant effect on other weekdays.

Table IV and V report regression results in the pre-financial crisis and post-financial crisis samples, respectively. As shown in Table IV, there was no significant negative Monday or Friday effect at all in the pre-financial crisis era from all indices. However, as shown in Table V, the day of the week effects are very significant in the post-financial crisis sample group. Comparing the results from preand post-financial crisis samples, we see the key difference is that the negative Monday effect and positive Friday effect become significant after the 2008 financial crisis. In addition, the day of the week effects are also more significant and larger in magnitude than the full sample results. Therefore, our test results do not support that the larger quantity of foreign capital flow into the NSE led to the higher market efficiency between 2008 and 2019. This may be partly attributed to the fact that there has been increased volatility in foreign financial inflows since 2008 (Osoro et al., 2020).

ii. Holiday Effect

Table II Presents the descriptive statistics of index returns. As the K-W test results show, the difference between returns before holidays and other trading days' returns is significant for the NSE All Share

index and. This finding is confirmed by the full sample regression results, as shown in Table III. We found significantly positive returns on pre-holiday trading days for the NSE All Share Index, but not for the NSE 20 Index. The result is significant at 5% level.

We investigate the impact of financial crisis on the holiday effects in the NSE in Table IV and V. An important finding from the comparison of test results reveals that the pre-holiday effect exhibits a statistically significant pattern of larger magnitudes specifically within large-cap companies listed in the NSE 20 Index following the financial crisis. Notably, prior to the financial crisis, the pre-holiday effect did not display statistical significance within the large-cap companies of the NSE 20 index. However, following the 2008 financial crisis, a significant shift occurred, with the pre-holiday effect attaining a high level of statistical significance at the 1% level for the NSE 20 Index. Additionally, in the NSE All Share Index encompassing smaller stocks, the pre-crisis significance diminishes in the post-crisis era. This observation aligns with previous studies suggesting that larger and well-established company stocks tend to garner greater attention from foreign investors.

4. Discussion and Summary

It is a common belief that development of financial market efficiency helps enhance quality and quantity of investments and consequently improve the living standards and economic growth (Nera and Eke, 2017). However, emerging securities exchanges typically have a small number of listings, fewer and less sophisticated traders and infrastructures, and thus low level of liquidity (Hearn and Pearse, 2006; Aduba et al., 2012). In this research, we find that both the day of week effects and pre-holiday effects have been strong and significant in the NSE since 2000. Both results do not support the EMH weak form in the NSE.

The NSE experienced a rapid growth of trading volume and value shortly after the 2008 financial crisis. The FDI in Kenya also has had a substantial increase since 2008. Many existing studies suggest enhanced viability of external finance benefits the stock market development (Ndirangu, Ouma, & Munyaka, 2014; Asongu, 2011), including one research on the NSE (King and Botha, 2015; Aduda et al., 2012). The research by Abuda et al. (2012) suggests that factors that help increasing foreign capital inflows are also important determinants of the NSE development. However, some others suggest FDI increase may have a negative impact and lead to higher level of speculation in the stock market, thus hurt its market efficiency (Osoro et al., 2020). King and Botha (2015) suggest that the NSE transitioned into a high-volatility state due to the contagion effects stemming from the developed market financial crisis.

Our results show that both calendar anomalies became more significant with increased FDI in Kenya after the 2008 financial crisis. More interestingly, for large cap stocks (NSE 20) that are typically better known to foreign investors, the day of week effect and holiday effect only became significant after the 2008 financial crisis. Besides, the calendar effects are stronger with the large cap stocks than other groups. Those findings are in line with previous studies by King and Botha (2015), Ndirangu, Ouma, & Munyaka (2014), Aduda et al. (2012), and Asongu (2011).

We have also observed, as expected, a negative Tuesday effect. Although further research is needed to reach a conclusion, this finding is in line with the negative Monday effect in the LSE and the hypothesis of the capital flow spillover effect from the UK, its largest foreign capital source. The spillover effect is also suggested by many previous studies (Aggarwal and Rivoli, 1989; Condoyanni, O'Hanlon, and Ward, 1987, Zhang et al., 2017).

Despite experiencing rapid growth in the aftermath of the 2008 financial crisis, the NSE still maintains a relatively modest number of listed firms and a small market capitalization compared to other prominent African markets like the Nigeria Stock Market and JSE. The findings of this research offer valuable insights into the market efficiency of the NSE and underscore the potential need for enhanced regulation and foreign investment policies to foster further development. In the future, we hope to extend our research to more aspects of the financial performance and efficiency

in African stock markets. Moreover, it would be worthwhile to further examine the profitability of potential "trading strategies" while considering transaction costs as a critical factor. This analysis may shed light on the viability and effectiveness of various trading strategies, ultimately contributing to the broader understanding of investment approaches in the African financial markets.

Biography notes

Xing Lu is an Associate Professor of Finance at Indiana University, South Bend, USA, holding a Doctorate degree in Finance from the University of Alabama. His research focuses on investment, financial markets and institutions, and behavioral finance.

Hong Zhuang is a Professor of Economics at Indiana University, South Bend, USA, possessing a Doctorate degree in Economics from the University of Oregon. Her research spans international economics, macroeconomics, development economics, and applied economics.

Jun Wang is an Associate Professor of Finance at the University of Montevallo, USA, with a Doctorate degree in Finance from the University of Alabama. His research is centered on investment and risk management.

Samuel Mbugua, a recent graduate of Indiana University South Bend, made contributions to this research project during his time at IUSB. Currently serving as an Investments Accountant at First Source Bank, USA, he holds a bachelor's degree in accounting and finance from Indiana University South Bend and is a Certified Public Accountant (CPA).

Hunter Holzhauer is an Associate Professor of Finance at the University of Tennessee, Chattanooga, USA, and holds a Doctorate degree in Finance from the University of Alabama. His research areas encompass investment, risk management, corporate finance, and ESG investing.

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Conflicts of interest

The authors declare no conflict of interest.

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Appendix





Table I. Index Descriptions

| | Index | Description | Inception Date in Our Sample |
|----------------|---------------------|---------------------------------------|------------------------------|
| Market Indices | NSE All Share Index | All stocks listed | Feb. 25, 2008 |
| | NSE 20 Index | Twenty largest and most liquid stocks | Jan. 4, 2000 |
| Sectors | Insurance | | Apr. 21, 2011 |
| | Energy | | Jan. 14, 2000 |
| | Investment | | Nov. 13, 2014 |
| | Construction | | Jan. 4, 2000 |
| | Manufacture | | Nov. 14, 2001 |
| | Commercial | | Feb. 19, 2007 |

| | Index | Return | Mean (Std. Dov.) | K-W Test [n-value] |
|----------------|---------------------|-----------|------------------|--------------------|
| Market Indices | NSE All Sharo Indov | Monday | 0002 (0076) | 12 026 [0116]** |
| Market mulces | NSE All Share muex | Tuesday | 0002 (.0076) | 12.926 [.0116] |
| | | Wednesday | -0.0001 (.0088) | |
| | | Thursday | 0.0003 (.0081) | |
| | | Triday | 0.0004 (.0081) | |
| | | Friday | 0.0007 (.0093) | 17 000 [0017]*** |
| | NSE 20 Index | Monday | 0001 (.0080) | 17.238 [.0017]*** |
| | | luesday | 0004 (.0091) | |
| | | Wednesday | .0001 (.0093) | |
| | | Thursday | 0001 (.0087) | |
| | | Friday | .0007 (.0084) | |
| | Insurance | Monday | .0005 (.0329) | 9.626 [.0472]** |
| | | Tuesday | 0009 (.0275) | |
| | | Wednesday | .0006 (.0271) | |
| | | Thursday | .0004 (.0264) | |
| | | Friday | 00002 (.0310) | |
| | Energy | Monday | .0002 (.0275) | 12.194 [.016]** |
| | | Tuesday | 0011 (.026) | |
| | | Wednesday | 0002 (.0253) | |
| | | Thursday | 0006 (.0259) | |
| | | Friday | .0002 (.0272) | |
| | Investment | Monday | 0005 (.0397) | 4.354 [.3385] |
| | | Tuesday | 0009 (.0354) | |
| | | Wednesday | 0011 (.0332) | |
| | | Thursday | 0009 (.0326) | |
| | | Friday | .0004 (.0321) | |
| Sectors | Construction | Monday | .0003 (.0313) | 2.805 [.5909] |
| | | Tuesday | .0007 (.0356) | |
| | | Wednesday | 0001 (.0348) | |
| | | Thursday | 00001 (.0339) | |
| | | Friday | .0002 (.0325) | |
| | Manufacture | Monday | 0003 (.0385) | 21.474 [.0003]** |
| | | Tuesday | .0004 (.0498) | - |
| | | Wednesday | 0006 (.0285) | |
| | | Thursday | 0001 (.0335) | |
| | | Friday | .0010 (.0304) | |
| | Commercial | Monday | 001 (.0365) | 15.112 [.0045]** |
| | | Tuesday | .0003 (.0437) | [.00.0] |
| | | Wednesday | - 0011 (0333) | |
| | | Thursday | - 0006 (0322) | |
| | | Friday | .0002 (.0322) | |

Table II. Full Sample Descriptive Statistics

*** represents significance at the 1% level. **represents significance at the 5% level. *represents significance at the 10% level. Only statistically significant results are reported

a. K-W test is a non-parametric method for testing whether samples originate from the same distribution. It is used for comparing two or more independent samples of equal or different sample sizes. It extends the Mann–Whitney U test, which is used for comparing only two groups. The parametric equivalent of the Kruskal–Wallis test is the one-way analysis of variance (ANOVA).

| Market Indices | NSE All Share Index | Pre_Holiday | .0010 | 4.41 [.0357]** |
|----------------|---------------------|--------------|---------|-----------------|
| | | Post_Holiday | .0007 | |
| | NSE 20 Index | Pre_Holiday | .0015 | 7.451 [.0063]** |
| | | Post_Holiday | -0.0003 | |
| Sectors | Insurance | Pre_Holiday | 0008 | |
| | | Post_Holiday | .0009 | |
| | Energy | Pre_Holiday | .0019 | |
| | | Post_Holiday | .0026 | 6.223 [.0126]** |
| | Investment | Pre_Holiday | 0.0016 | |
| | | Post_Holiday | 0013 | |
| | Construction | Pre_Holiday | .0016 | 3.3 [.0693]* |
| | | Post_Holiday | .0007 | |
| | Manufacture | Pre_Holiday | .0015 | 2.811 [.0936]* |
| | | Post_Holiday | .0011 | |
| | Commercial | Pre_Holiday | .0021 | 7.026 [.008]*** |
| | | Post_Holiday | .0014 | |

Panel B. Holiday Effect

| | Panel A. The Day of the Week Effect | | | |
|----------------|-------------------------------------|---------------|-----------------------|--|
| Category | Index | Return | Coefficient [p-value] | |
| Market Indices | NSE All Share Index | Monday | 0013 [.001]*** | |
| | | Tuesday | | |
| | | Wednesday | | |
| | | Thursday | | |
| | | Friday (Cons) | 0006[017]** | |
| | NSE 20 Index | Monday | - 0012 [000]*** | |
| | NOL 20 Macx | Tuesday | - 0008 [005]*** | |
| | | Wednesday | | |
| | | Thursday | - 0006 [041]** | |
| | | Friday (Cons) | 0005 [006]*** | |
| | Insuranco | Monday (Cons) | .0003 [.000] | |
| | mourance | Tuesday | 0007 [.014] | |
| | | Wednesday | | |
| | | Thursday | | |
| | | Friday (Cons) | 0000 [021]** | |
| | | Fludy (Colls) | .0009[.031] | |
| | Energy | Monday | | |
| | 0, | Tuesday | | |
| | | Wednesday | | |
| | | Thursday | | |
| | | Friday (Cons) | | |
| | Investment | Monday | | |
| | | Tuesday | 0012 [.045]** | |
| | | Wednesday | | |
| | | Thursday | | |
| | | Friday (Cons) | | |
| Sectors | Construction | Monday | | |
| | | Tuesday | | |
| | | Wednesday | | |
| | | Thursday | | |
| | | Friday | | |
| | Manufacture | Monday (Cons) | 0004 [.009]*** | |
| | | Tuesday | | |
| | | Wednesday | | |
| | | Thursday | | |
| | | Friday | .001 [.000]*** | |
| | Commercial | Monday | 0011 [.002]*** | |
| | | Tuesday | 0008 [.016]** | |
| | | Wednesday | 0012 [.000]*** | |
| | | Thursday | | |
| | | Friday (Cons) | | |

Table III. Full Sample Regression

Panel B. Holiday Effect

| | Index | Const. [p-value] | Pre_Holiday [p-value] | Post_Holiday [p-value] |
|----------------|---------------------|------------------|-----------------------|------------------------|
| Market Indices | NSE All Share Index | 0001 | .0014[.003]*** | .0002 |
| | NSE 20 Index | 0.0004[.008]*** | -0.0001 | -0.0001 |
| | Insurance | 0003[.01]*** | 0.0005 | 0.00005 |
| | Energy | 001[.000]*** | 0.0003 | .0015[.044]** |
| | Investment | -0005[.016]** | .0008 | 0002 |
| Sectors | Construction | 0001 | .0007 | .0005 |
| | Manufacture | 0001[.08]* | .0005 | .0001 |
| | Commercial | 0006[.000]**4 | .0013[.028]** | .0003 |

| | Panel A. The Day of the Week Effect | | | |
|----------------|-------------------------------------|---------------|-----------------------|--|
| Category | Index | Return | Coefficient [p-value] | |
| Market Indices | NSE All Share Index | Monday | | |
| | | Tuesday | | |
| | | Wednesday | | |
| | | Thursday | | |
| | | Friday (Cons) | | |
| | NSE 20 Index | Monday | | |
| | | Tuesday | | |
| | | Wednesday | | |
| | | Thursday | | |
| | | Friday (Cons) | | |
| | Insurance | Monday (Cons) | | |
| | | Tuesday | | |
| | | Wednesday | | |
| | | Thursday | | |
| | | Friday (Cons) | | |
| | | | | |
| | Energy | Monday | 0010 [.099]* | |
| | | Tuesday | | |
| | | Wednesday | | |
| | | Thursday | | |
| | | Friday (Cons) | | |
| | Investment | Monday | | |
| | | Tuesday | | |
| | | Wednesday | 0047 [.022]** | |
| | | Thursday | | |
| | | Friday (Cons) | .0031 [.033]** | |
| Sectors | Construction | Monday | | |
| | | Tuesday | .0032 [.065]* | |
| | | Wednesday | | |
| | | Thursday | | |
| | | Friday | | |
| | Manufacture | Monday (Cons) | 001 [.071]* | |
| | | Tuesday | 0013 [.019]** | |
| | | Wednesday | | |
| | | Thursday | | |
| | | Friday | .0009 [.015]** | |
| | Commercial | Monday | 0016 [.007]*** | |
| | | Tuesday | 001 [.091]* | |
| | | Wednesday | 0017 [.003]*** | |
| | | Thursday | 0013 [.021]** | |
| | | Friday (Cons) | .0009 [.026]** | |

Table IV. Regression Results: Before Financial Crisis

Panel B. Holiday Effect

| | Index | Const. [p-value] | Pre_Holiday [p-value] | Post_Holiday [p-value] |
|----------------|---------------------|------------------|-----------------------|------------------------|
| Market Indices | NSE All Share Index | 0014 [.069]* | .0125 [.019]** | .0058 |
| | NSE 20 Index | .0001 | .0008 | .001 |
| | Insurance | .0003 | .0018 | .0084 [.001]*** |
| | Energy | 0012 [.000]*** | 00002 | .0035 [.034]** |
| | Investment | .0003 | .0015 | .0018 |
| Sectors | Construction | .0004 | .0008 | 00003 |
| | Manufacture | .0001 | .003 [.002]*** | 0012 |
| | Commercial | 0003 | .0013 | .0007 |

| | Panel A | . The Day of the We | eek Effect |
|----------------|---------------------|---------------------|-----------------------|
| Category | Index | Return | Coefficient [p-value] |
| Market Indices | NSE All Share Index | Monday | 0015 [.000]*** |
| | | Tuesday | |
| | | Wednesday | |
| | | Thursday | |
| | | Friday (Cons) | .0007 [.007]*** |
| | NSE 20 Index | Monday | 0017 [.000]*** |
| | | Tuesday | 0011 [.003]*** |
| | | Wednesday | 0007 [.040]** |
| | | Thursday | 0007 [.059]* |
| | | Friday (Cons) | .0006 [.013]** |
| | Insurance | Monday (Cons) | |
| | | Tuesday | |
| | | Wednesday | .0013 [.006]*** |
| | | Thursday | .0013 [.006]*** |
| | | Friday (Cons) | .0012 [.013]** |
| | Energy | Monday | 0009 [.038]** |
| | | Tuesday | 0013 [.003]** |
| | | Wednesday | |
| | | Thursday | |
| | | Friday (Cons) | |
| | Investment | Monday | |
| | | Tuesday | 001 [.041]** |
| | | Wednesday | |
| | | Thursday | |
| | | Friday (Cons) | |
| Sectors | Construction | Monday | |
| | | Tuesday | |
| | | Wednesday | |
| | | Thursday | |
| | | Friday | |
| | Manufacture | Monday (Cons) | |
| | | Tuesday | 0013 [.019]** |
| | | Wednesday | |
| | | Thursday | |
| | | Friday | |
| | Commercial | Monday | 0006 [.001]*** |
| | | Tuesday | |
| | | Wednesday | |
| | | Thursday | .0004 [.099]* |
| | | Friday (Cons) | .0012 [.000]*** |

Table V. Regression Results: Post Financial Crisis

Panel B. Holiday Effect

| | Index | Const. [p-value] | Pre_Holiday [p-value] | Post_Holiday [p-value] |
|----------------|---------------------|------------------|-----------------------|------------------------|
| Market Indices | NSE All Share Index | .0002 [.052]* | .001 | .0004 |
| | NSE 20 Index | 0002 [.039]** | .0018 [.003]*** | 0002 |
| | Insurance | 0004 [.009]*** | .0006 | 0005 |
| | Energy | 0008 [.000]*** | .0003 | .0004 |
| | Investment | 0007 [.004]*** | .0007 | 0008 |
| Sectors | Construction | 0002 | .0008 | .0006 |
| | Manufacture | 0002 [.014]** | 0001 | .0004 |
| | Commercial | 0007 [.000]*** | .0012 [.088]* | .0003 |