EXAMINING THE HOLIDAY EFFECT ON THE STOCK MARKET RETURNS: EVIDENCE FROM THE NAIROBI SECURITIES EXCHANGE

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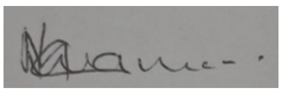
DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

Mariana Mulinge



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Approval

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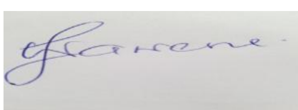

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ABSTRACT

Stock market efficiency remains a central concern in financial economics, particularly in frontier markets where market frictions and trading interruptions can generate predictable return patterns (Fama, 1970; Lo, 2004). This study examines the effect of holiday trading on returns at the Nairobi Securities Exchange (NSE), focusing on scheduled and ad hoc public holidays and the persistence of these effects. The analysis is grounded in the Efficient Market Hypothesis, Adaptive Market Hypothesis, and behavioral finance, which collectively suggest that market efficiency may vary across time and conditions. Using daily NSE All Share Index data from 2019–2025, the study applies event study methodology to estimate abnormal and cumulative abnormal returns, complemented by robust OLS, EGARCH (1,1), and quantile regression techniques. The results indicate that baseline holiday effects are statistically insignificant, supporting weak-form efficiency in normal periods. However, regime-specific analysis reveals a significant negative effect for ad hoc post-holidays during the COVID-19 crisis, consistent with evidence that market stress can amplify anomalies. Volatility findings show asymmetric responses to shocks, while quantile regression results demonstrate that holiday effects during the crisis are concentrated in the lower tail of returns, indicating heightened downside risk. The findings suggest that while the NSE exhibits general efficiency, temporary inefficiencies emerge during periods of disruption, particularly around ad hoc holidays. These results provide important implications for policymakers regarding trading interruptions and for investors managing risk in frontier markets.

Keywords: *Stock market efficiency; Holiday effects; Ad hoc trading interruptions; Volatility dynamics; Nairobi Securities Exchange*

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ABREVIATIONS AND ACRONYMS

AMH - Adaptive Markets Hypothesis

AR - Abnormal returns

CAR - Cumulative abnormal returns

CBK – Central Bank of Kenya

EMH - Efficient Market Hypothesis

NASI - NSE All Share Index

NSE - Nairobi Securities Exchange

PHOL - Pre-holiday dummy

POSTH - Post-holiday dummy

AHPRE - Pre - Ad hoc holiday dummy

AHPOST - Post- Ad hoc holiday dummy

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DEFINITION OF TERMS

Abnormal Return (AR) - The difference between the actual return of a security and its expected return estimated using a benchmark model. It represents the portion of return attributable to a specific event (MacKinlay, 1997).

Ad hoc holidays **-** Non-gazetted public holidays that are declared by government authorities outside the officially established annual holiday calendar (Government of Kenya, 2023).

Cumulative Abnormal Return (CAR) - The aggregate of abnormal returns over a specified event window used to measure the total impact of an event over time (MacKinlay, 1997).

Calendar Anomalies - Systematic and predictable patterns in stock returns associated with specific calendar periods, such as the holiday effect, January effect, or day-of-the-week effect (Alagidede, 2013).

Efficient Market Hypothesis (EMH) - A theory proposing that stock prices fully reflect all available information, implying that consistent abnormal returns cannot be systematically achieved (Fama, 1970).

Event - A specific occurrence expected to influence stock prices. In this study, the event refers to a public holiday affecting trading activity at the Nairobi Securities Exchange (MacKinlay, 1997).

Event Day (Day 0) - The reference trading day around which abnormal returns are measured. In holiday effect studies, this is typically defined as the last trading day before the holiday (MacKinlay, 1997).

Event Window - The period surrounding the event day during which abnormal returns are examined (Example -1 to +1 trading days) (MacKinlay, 1997).

Expected Return - The return predicted by a statistical model assuming no event-related influence (MacKinlay, 1997).

Holiday Effect - A stock market anomaly characterized by significantly higher (or lower) average returns on trading days immediately preceding or following public holidays (Ariel, 1990).

Long-Term Effect - The impact of an event measured over a relatively extended event window (e.g., −5 to +5 days), capturing prolonged market reactions (Brown & Warner, 1985).

Short-Term Effect - The immediate impact of an event, typically measured over a narrow event window such as −1 to +1 trading days (Brown & Warner, 1985).

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

Stock market returns play a central role in modern financial systems by guiding capital allocation, reflecting investor expectations, and transmitting macroeconomic and firm-level information into prices (Wainaina et al., 2024; Demir, 2025). Returns, commonly measured as proportional changes in asset prices over time, summarize how markets assess risk, growth prospects, and uncertainty (Reilly & Brown, 2011). Persistent movements in returns, therefore, provide critical evidence on whether markets efficiently incorporate information or remain susceptible to systematic distortions (Burton, 2017; Cueva & Iturbe-Ormaetxe, 2025).

The Efficient Market Hypothesis (EMH) posits that security prices fully and rapidly reflect all publicly available information, implying that consistent abnormal returns cannot be earned using predictable strategies (Fama, 1970; O'Sullivan, 2018). Under the weak form of efficiency, historical price patterns and publicly observable calendar information, such as trading days surrounding holidays, should have no explanatory power over future returns. However, decades of empirical research document recurrent deviations from this theoretical benchmark, particularly in the form of calendar anomalies, where stock returns exhibit systematic temporal patterns inconsistent with random price movements (Woo et al., 2020; Tabash et al., 2025).

Calendar anomalies refer to predictable return variations associated with specific time periods, including the day-of-the-week effect, month-of-the-year effect, turn-of-the-month effect, and holiday-related effects (Elangovan et al., 2022; Adam et al., 2025). Their persistence poses a direct challenge to EMH because calendar information is costless, widely known, and easily exploitable. As such, any enduring return premium linked to calendar timing raises questions about behavioral biases, institutional frictions, and limits to arbitrage that prevent full efficiency (Malini, 2019; Zhang, 2025).

Among calendar anomalies, the Holiday Effect has been one of the most consistently documented across markets and time periods. The effect refers to the tendency for stock returns to be abnormally high on trading days immediately preceding public holidays, with some studies also identifying post-holiday reversals (Ariel, 1990). A study by Liu et al. (2023) reveals that the stock market experiences a transition from regular trading sessions into holiday periods, resulting in an increase in investor sentiment. This finding highlights the beneficial impact of holidays on investor sentiment. Subsequent international studies confirm that this pattern is not confined to the U.S. Cadsby & Ratner (1992) document pre-holiday return premiums of comparable magnitude in Asian markets and smaller but still statistically significant effects in Europe and North America. More recent evidence suggests that while institutional trading and algorithmic execution have reduced value-weighted premiums, the anomaly persists in equal-weighted portfolios and among smaller firms, indicating incomplete arbitrage (Weller, 2018; Gordon et al., 2025). Table 1.1 presents a comparison of pre-holiday and non-holiday returns across selected major markets over different time periods.

Table 1.1: Pre-Holiday Return Premiums Across Major Markets (Selected Studies)

Market / Study	**Period**	**Pre-Holiday Return (%)**	**Non-Holiday Return (%)**	**Premium Multiple**
Historical Evidence				
U.S. (Ariel, 1990)	1963–1982	0.48	0.07	6.9×
Asia (Cadsby & Ratner, 1992)	1962–1989	~0.42	~0.06	~7×
Contemporary Evidence				
U.S. Equal-Weighted (Weller, 2018)	1993–2016	0.21	0.04	5.3×
U.S. Value-Weighted (Gordon et al., 2025)	2000–2023	0.09	0.03	3.0×
Emerging Markets (Elangovan et al., 2022)	2010–2020	0.37	0.08	4.6×
Global Markets (Tabash et al., 2025)	2015–2023	0.28	0.06	4.7×
African Frontier Markets (Adam et al., 2025)	2012–2023	0.44	0.09	4.9×
Developed Markets Post-COVID (Liu et al., 2023)	2020–2022	0.15	0.04	3.8×

Source: Compiled from Ariel (1990); Cadsby & Ratner (1992); Weller (2018); Elangovan et al. (2022); Liu et al. (2023); Gordon et al. (2025); Tabash et al. (2025); Adam et al. (2025)

Table 1.1 summarizes evidence on the pre-holiday effect across major equity markets and time periods, consistently showing that average returns on pre-holiday trading days exceed those on non-holiday days. Early evidence from the U.S. market (Ariel, 1990) indicates that pre-holiday returns were nearly seven times higher than non-holiday returns, a pattern similarly observed in Asian markets (Cadsby & Ratner, 1992). Although the magnitude of the effect is smaller in

Europe and North America, pre-holiday returns remain approximately three times higher than non-holiday returns (Weller, 2018). Evidence from the value-weighted S&P 500 over the 2000–2020 period suggests that the pre-holiday effect persists over time, with pre-holiday returns substantially exceeding non-holiday returns (Gordon et al., 2025).

Behavioral explanations dominate the literature, particularly the Mood Maintenance Hypothesis, which argues that investors are less inclined to process negative information before holidays, resulting in upward price pressure and temporarily suppressed risk aversion (Kliger & Kudryavtsev, 2014; López-Guzmán & Sautua, 2024). Importantly, the persistence of this effect in highly developed markets suggests that technological sophistication alone does not eliminate predictable return patterns.

The persistence of calendar anomalies is often more pronounced in frontier and emerging markets, where thin trading, institutional constraints, and culturally significant holidays intensify sentiment-driven behavior (Shahid, 2017; Huynh et al., 2025). African equity markets entered 2025 as some of the strongest-performing frontier markets globally. In that year, the Malawi Stock Exchange recorded an annual return of 247.6%, while the Ghana Stock Exchange and Nigeria's NGX delivered returns of 79.3% and 51.2%, respectively (The Trading Room, 2026).

In these markets, holiday effects are reinforced by religious and national calendars that lead to predictable liquidity withdrawals and retail-dominated trading. Empirical studies across Sub-Saharan Africa indicate that pre-holiday returns frequently exceed global averages, while negative reversals often characterize post-holiday periods as optimism dissipates (Kudryavtsev, 2019; Mazviona et al., 2021).

The Nairobi Securities Exchange (NSE), established in 1954, is the principal securities market in Kenya and a key frontier exchange in the region, providing a platform for trading equities, bonds, ETFs, and derivatives under the oversight of the Capital Markets Authority. Following its demutualization and self-listing in 2014, the NSE has enhanced its governance, transparency, and operational efficiency, supported by an automated trading system and central depository infrastructure. Despite these developments, the market remains characterized by episodic liquidity constraints, relatively high volatility, and heightened sensitivity to political and institutional developments (Njoroge & Matanda., 2023). Over the period of the study, the Kenyan stock market experienced significant fluctuations in returns, reflecting a combination of macroeconomic pressures, political events, and periods of renewed investor optimism. Despite episodes of market recovery and increased trading activity, concerns persist regarding return predictability and the extent to which prices fully reflect available information.

After several years of subdued performance, the NSE experienced a strong recovery in 2025. By January, total market capitalization had reached approximately Kshs 3.028 trillion, reflecting an increase of over Kshs 1 trillion within a single year. Over the same period, the NSE All Share Index (NASI) recorded a 51.1% annual gain, its strongest performance since 2008 (Kenyan Wallstreet, 2025).

Table 1.2 presents a comparative summary of selected global and African equity market indices, highlighting their annual returns in 2025.

Table 1.2: Summary of Market Performance (2025)

Market Index	2025 Annual Return (%)	Primary Driver
S&P 500 (US)	16.00%	AI Innovation & Tech Growth
MSE (Malawi)	247.60%	Currency Stability & Corporate Earnings
GSE (Ghana)	79.30%	Banking Sector Re-rating
NASI (Kenya)	51.10%	Macroeconomic Recovery & Interest Rate Cuts

Source: Adapted from Kenyan Wallstreet (2025) and Trading Room (2026)

This recovery coincided with accommodative monetary policy. In late 2025, the Central Bank of Kenya reduced the Central Bank Rate to 9.25%, promoting a shift of capital from fixed-income securities to equities (CBK, 2025). Banking and blue-chip stocks accounted for a significant share of the rally, supported by renewed foreign inflows and improved domestic sentiment.

This resurgence presents a critical contradiction. In a high-liquidity and high-growth environment, persistent abnormal returns around predictable events such as public holidays would suggest that price discovery remains sentiment-driven rather than fundamentally anchored (Bekaert & Harvey, 2003). Such a pattern would undermine the NSE's strategic objective of attaining world-class frontier market status.

Empirical studies focusing on the NSE provide mixed evidence regarding the existence and nature of the holiday effect. Kamau (2017) reports that holiday effects vary across different public and religious holidays, with state holidays generating higher abnormal returns than religious holidays. Ndiritu (2020) finds that pre-holiday returns tend to exceed post-holiday returns, while Onuko (2020) reports no statistically significant holiday effect when examining aggregate market data.

Existing NSE studies exhibit notable limitations. First, they predominantly focus on scheduled and gazetted holidays, implicitly assuming that investor behavior adjusts gradually and predictably. Second, most studies treat the NSE as a homogeneous market, overlooking potential sectoral heterogeneity in holiday-related return dynamics. Third, prior research largely emphasizes short-term effects, leaving the long-term implications of holiday-induced return patterns underexplored. Finally, there is a paucity of empirical evidence on ad hoc holidays, unscheduled public holidays announced with limited notice, despite their increasing prevalence in Kenya due to political events, national observances, and religious considerations.

1.2. Problem Statement

Despite the Nairobi Securities Exchange recording a holistic market capitalization of approximately Kshs 3 trillion and achieving a 51.5% market recovery in 2025 (Kenyan Wallstreet, 2025), the efficiency of its price discovery mechanism remains uncertain. According to the Efficient Market Hypothesis, periods of heightened liquidity, increased participation, and improved macroeconomic conditions should reduce predictable return patterns, including calendar-based anomalies such as the Holliday Effect (Fama, 1970; Kasidi & Banafa, 2022).

Empirical evidence from both global and frontier markets suggests that holiday-related abnormal returns often persist even during market expansions, contradicting studies that report mixed findings (O'Sullivan, 2018; Adam et al., 2025). At the NSE, existing studies report mixed findings, with some documenting significant pre-holiday return premiums while others find weak or inconsistent effects depending on the sample period and methodology employed (Hemed, 2015; Onuko, 2020; Njoroge & Matanda., 2023). Kamau (2017), using event-study methodology, reports statistically significant variation in abnormal returns across holiday types, finding that state/public holidays generate higher average abnormal returns (approximately +0.6% to +1.2%) in the pre-holiday window compared to religious holidays, which exhibit weaker and often statistically insignificant abnormal returns (generally below +0.3%). Ndiritu (2020) further documents a clear asymmetry between pre- and post-holiday trading behavior, showing that average pre-holiday returns are positive and significantly higher (around +0.4% to +0.9%) than post-holiday returns, which are typically negative or close to zero (ranging from about -0.2% to +0.1%), indicating a reversal pattern consistent with short-term investor optimism before holidays. Onuko (2020), using aggregate market index data over a broader sample period, finds no statistically significant holiday effect at conventional levels (p-values above 0.10), with mean abnormal returns around zero and confidence intervals spanning both positive and negative values, suggesting that any observed holiday-related fluctuations are not systematically different from normal market noise when the market is examined in aggregate

This contradiction constitutes a practical and theoretical problem. On the one hand, strong aggregate market performance suggests improving efficiency and maturity. On the other hand, the persistence of abnormal returns around predictable calendar events would imply continued sentiment-driven pricing, sub-optimal capital allocation, and increased risk for uninformed investors (Ariel, 1990; Lakonishok & Smidt, 1988; Baker & Wurgler, 2007; Barberis et al, 1998). The problem is further compounded by frequent public and religious holidays, substantial retail investor participation, and an increasing number of ad hoc holidays announced with limited notice.

Existing studies at the NSE are limited in three key respects. First, they largely exclude ad hoc holidays, despite their potential to generate abrupt liquidity and sentiment shocks. Second, they often focus on short-term windows, limiting generalizability across a broader market window. Third, they provide limited insight into whether holiday-related return patterns persist or dissipate over time, particularly during periods of recovery-driven liquidity expansion. Also, there is insufficient evidence on how different types of holidays; scheduled and ad hoc, affect stock market returns at the NSE during a period of strong market recovery. This combination of inconclusive findings and an unexamined dimension of holiday effects justify the need for this study.

1.3. Research Objectives

1.3.1. General Objective

To examine the effect of holiday-related trading interruptions on stock market returns at the Nairobi Securities Exchange (NSE).

1.3.2. Specific Objectives

i. To determine the effect of the scheduled public holidays on daily stock market returns at the NSE.
ii. To examine the effect of the ad hoc public holidays on daily stock market returns at the NSE.
iii. To compare short-term and long-term return behavior associated with holiday-related trading interruptions at the NSE

1.4. Research Questions

i. What is the effect of the scheduled public holidays on daily stock market returns at the NSE?
ii. How do ad hoc public holidays influence stock market returns at the NSE?
iii. Do holiday-related effects persist beyond the immediate pre- and post-holiday period?

1.5. Scope of the Study

The study was geographically limited to the Nairobi Securities Exchange (NSE) in Kenya and specifically focused on the NSE All Share Index (NASI) as a proxy for overall market performance. The unit of analysis comprised daily market returns derived from NASI daily closing prices. The study covered the period from January 2019 to December 2025, encompassing the Pre-COVID period (January 2019–February 2020), the COVID-19 crisis period (March 2020–December 2021), and the Post-COVID recovery period (January 2022–December 2025). The key variables included stock market returns as the dependent variable and holiday events (scheduled public holidays, religious holidays, and ad hoc holidays) as the independent variables. The study was limited to examining the impact of holiday events on aggregate market returns and volatility. The findings do not capture firm-specific responses, sectoral variations, intraday trading dynamics, or the influence of firm-level fundamentals. Also, the use of NASI as a market-wide index may mask heterogeneity in holiday effects across individual stocks and sectors.

1.6. Significance of the Study

1.6.1. Academic Significance

The study contributes to the empirical literature on the calendar anomalies by extending the Holiday Effect analysis to a frontier market during a recovery-driven liquidity expansion. By distinguishing between scheduled and ad hoc holidays and examining both short- and longer-term return patterns, the study addresses key gaps in existing research and informs the debate on weak-form market efficiency.

1.6.2. Significance to investors

For investors, the findings provide evidence on whether predictable return patterns exist around holiday periods at the NSE. This information supports improved portfolio timing, risk management, and investment decision-making in a market where sentiment effects may remain influential.

1.6.3. Policymakers and Regulators

For policymakers and regulators, the study offers insight into how holiday-related trading interruptions affect the overall market performance and price discovery. Evidence of persistent anomalies may inform decisions on market scheduling, communication of ad hoc holidays, and broader initiatives aimed at enhancing market efficiency and investor confidence.

1.7. Chapter Summary

This chapter introduced the study by outlining the contextual foundations of the Holiday Effect in stock market returns. It reviewed global, regional, and local trends in holiday-related return behavior, highlighting contradictions between the predictions of the EMH and observed market outcomes. The chapter also demonstrated that, despite a strong recovery and increased liquidity at the NSE, uncertainties remain regarding the efficiency of price discovery, particularly around scheduled and ad hoc public holidays. The research problem, objectives, questions, scope, and significance of the study were then clearly articulated, establishing the basis for the methodological approach and empirical analysis presented in subsequent chapters.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

This chapter critically reviews theoretical and empirical literature relevant to the examination of holiday effects on stock market returns, with specific reference to the Nairobi Securities Exchange (NSE). Consistent with the research objectives outlined in Chapter One, the review is structured to achieve the three purposes. First, it evaluates the theoretical foundations underpinning calendar anomalies, focusing on their explanatory power in emerging and frontier markets. Second, it synthesizes and critiques empirical studies on scheduled and ad hoc public holidays, emphasizing methodological studies. Third, it identifies the conceptual, methodological, and geographical gaps in the existing literature that justify the present study.

The theoretical framework provides key financial and behavioral theories that explain seasonal effects in securities markets. The empirical review section examines previous studies on the holiday effect, identifying key findings, methodologies, and gaps in the existing body of knowledge. The conceptual framework visually represents the relationships between the variables associated with the holiday effect. Whereas operationalization of variables provides clear definitions and measurement strategies that will guide the subsequent analysis in this study.

2.2. Theoretical framework

This study explored the holiday effect through a multi-theory approach that incorporates the Efficient Market Hypothesis (EMH), Behavioral Finance Framework, and Adaptive Markets Hypothesis (AMH). EMH provides a robust foundation for understanding market efficiency, but it falls short in accounting for irrational behaviors observed during market anomalies. Behavioral finance offers insights into how cognitive biases such as overconfidence and herd behavior can influence investor decisions, leading to predictable patterns in stock performance but lacks a comprehensive framework for understanding how these behaviors might adapt over time. The AMH bridges this gap by suggesting that market participants are not only influenced by psychological biases but also adapt their strategies as market conditions evolve. Adopting the multi-theory approach helps address the limitations inherent in each individual theory allowing for a more comprehensive understanding of the holiday effect on stock market returns.

2.2.1. Efficient Market Hypothesis (EMH)

The Efficient Market Hypothesis (EMH) posits that asset prices fully and instantaneously reflect all available information, rendering systematic excess returns impossible (Fama, 1970). Under the weak-form EMH, historical price patterns, such as predictable abnormal returns around holidays, should not persist once transaction costs and risk adjustments are considered (O'Sullivan, 2018).

From an EMH perspective, public holidays represent predictable, non-informational events. As such, neither scheduled nor ad hoc holidays should exert statistically significant effects on stock market returns once transaction costs and risk adjustments are accounted for, markets such as the United States have shown that some calendar anomalies weaken or disappear after public dissemination, lending partial support to EMH (Vidal-García & Vidal).

The applicability of EMH to frontier markets such as Kenya remains contentious. The NSE is characterized by relatively thin trading, limited analyst coverage, high retail investor participation, and episodic liquidity shocks, particularly around non-trading days. These features undermine the strict assumptions of instantaneous information processing and frictionless arbitrage required for EMH to hold.

This study evaluates the validity of EMH in the Kenyan context by examining the relationship between holiday-related variables and stock market performance at the Nairobi Securities Exchange. Consistent with the weak-form EMH, independent variables are not expected to exert statistically significant influence on returns so any systematic patterns would indicate departures from market efficiency.

2.2.2. Behavioral Finance Framework

Behavioral Finance Theory relaxes the rationality assumptions of EMH by incorporating psychological biases and sentiment-driven behavior into asset pricing (Shiller, 2003; Barberis et al., 1998). Within this framework, holiday effects are interpreted as manifestations of systematic investor sentiment, mood, and attention constraints.

Several key behavioral theories underpin the Behavioral Finance Framework and provide insights into how holidays impact stock returns. Prospect Theory (Kahneman & Tversky, 1979) suggests that investors perceive gains and losses asymmetrically, often exhibiting risk-averse behavior in gains and risk-seeking behavior in losses. Around holidays, heightened investor optimism may lead to increased risk-taking and buying pressure, resulting in a pre-holiday stock price surge (Liu et al., 2023). However, as markets return to normal post-holiday, sentiment dissipates, often leading to lower returns. Overconfidence Theory (Odean, 1999) explains that investors tend to overestimate their predictive abilities, leading to excessive trading and inflated asset prices before holiday breaks (Woo et al., 2020). Institutional traders, motivated by portfolio rebalancing and window-dressing strategies, may further increase trading volume ahead of major holidays, intensifying short-term price hikes (Shiller, 1981). Herding Theory (Bikhchandani et al., 1992) describes how investors follow market trends rather than making independent decisions, which is particularly evident around holidays when positive sentiment and collective optimism fuel coordinated buying pressure, reinforcing the pre-holiday effect (Pinto et al., 2022). Even when the fundamentals indicate otherwise, an investor's overconfidence and optimism about a stock’s future lead to aggressive trading and extraordinary returns (Hirshleifer, 2015).

In the context of this study, the Behavioral Finance Framework explains the holiday effect as a function of investor sentiment, cognitive biases, and psychological heuristics, which influence stock price movements before and after holidays. As the independent variable, the holiday effect leads to abnormal pre-holiday stock returns, often driven by overconfidence and herding behavior, while post-holiday periods may experience return reversals as sentiment normalizes. The short-term impact of holidays is largely attributed to excessive trading and speculative optimism, whereas long-term adjustments align with prospect theory, as markets gradually revert to their fundamental valuations.

2.2.3. Adaptive Markets Hypothesis (AMH)

The Adaptive Market Hypothesis integrates elements of EMH and Behavioral Finance by proposing that market efficiency is not static but evolves over time in response to changing market conditions, institutional structures, and investor learning (Lo, 2004). According to AMH, anomalies such as holiday effects may appear, disappear, or re-emerge depending on economic regimes, regulatory changes, and market maturity.

This perspective is particularly relevant for the NSE, which has undergone significant structural and macroeconomic shifts between 2019 and 2025, including the COVID-19 pandemic, monetary tightening cycles, and episodic political uncertainty (CBK, 2023). Under AMH, such shocks may temporarily amplify or dampen holiday-related return patterns, leading to time-varying effects rather than persistent anomalies.

AMH provides the theoretical foundation for examining both short-run and long-run dynamics of holiday-induced returns and volatility, directly supporting the study's comparative analysis across sub-periods (pre-COVID, COVID, and post-COVID) and aligning with the objective of assessing whether holiday effects persist or dissipate under different market conditions.

2.3. Empirical Literature Review

The empirical review section is discussed and presented according to the specific objectives of the study.

2.3.1. Scheduled Public Holidays and Stock Market Returns

Empirical investigation of scheduled public holidays represents the most established stand of holiday-effect research. Early fundamental studies in developed markets consistently document abnormally high returns on trading days preceding public holidays, thereby challenging weak-form market efficiency. Ariel (1990), using U.S. CRSP data, demonstrated that a disproportionate share of annual equity returns occurred on pre-holiday trading days, a result robust to firm size, dividend effects, and standard risk adjustments. This study was instrumental in elevating the holiday effect from anecdotal observation to a recognized financial anomaly.

Subsequent international extensions reinforce the cross-market persistence of the anomaly. Cadsby and Ratner (1992) reported statistically significant pre-holiday return premia across multiple markets in North America, Europe, and Asia, though with notable heterogeneity in magnitude. Importantly, their findings highlighted a recurring limitation in holiday-effect research: small holiday samples reduce statistical power and complicate inference, particularly when holidays overlap with month-end or year-end effects.

More recent evidence suggests that scheduled holiday effects have not disappeared but have evolved. Similar conclusions are reached by Weller (2018) and Gordon et al. (2025), who attribute the redistribution of anomalies to institutional trading dominance and algorithmic liquidity provision rather than improved informational efficiency.

Cross-country studies further demonstrated that scheduled holiday effects remain pronounced in emerging markets. Elangovan et al. (2022) and Adam et al. (2025) document statistically significant pre-holiday returns across both developed and emerging economies, attributing persistence to behavioral sentiment cycles and liquidity withdrawal rather than informational opacity. Tabash et al. (2025) further find that holiday effects intensify during periods of macroeconomic recovery, a result directly relevant to the NSE's post-2024 rebound.

Evidence from Sub-Saharan Africa suggests even stronger effects. Huyng et al. (2025) report that frontier markets exhibit larger pre-holiday premiums and sharper post-holiday reversals than developed markets, reflecting thin trading and heightened sentiment sensitivity. However, many African studies rely on pooled samples, thereby masking country-specific dynamics.

At the NSE, empirical findings generally support the existence of scheduled holiday effects, albeit with methodological inconsistencies. Kamau (2016, 2017) finds that state holidays generate higher abnormal returns than religious holidays, while Ndiritu (2020) reports systematically higher pre-holiday returns relative to post-holiday returns. Conversely, Onuko (2020) finds no significant effects when using aggregate indices, suggesting that index aggregation and model specification materially influence outcomes.

The NSE existing literature exhibits predominantly focus on scheduled holidays neglecting the potential impact of ad hoc holidays, which may induce different behavioral and informational dynamics due to their unexpected nature. Also most NSE studies rely on pre-pandemic data and do not account for structural liquidity changes observed after 2024. This temporal limitation constrains inference regarding whether improved trading conditions have reduced or reinforced scheduled holiday anomalies.

2.3.2. Ad Hoc Public Holidays and Stock Market Returns

In contrast to scheduled holidays, empirical research on ad hoc public holidays remains sparse despite their potentially greater informational content. Ad hoc holidays are typically announced with limited notice and often coincide with political events, national emergencies, or mobilization, introducing uncertainty rather than predictable sentiment cycles.

International evidence suggests that unscheduled market interruptions are associated with heightened volatility and abnormal returns upon reopening. Bialkowski et al. (2012) demonstrate that politically induced market closures generate asymmetric return adjustments, with negative effects more pronounced when closures signal instability. Bergsma and Jiang (2016) identified a significant correlation between positive investor sentiment during cultural holidays and increased stock returns. Recent studies by Demir (2025) and Cueva & Iturbe-Ormaetxe (2025) further show that unscheduled trading interruptions elevate risk premium, particularly in markets with weaker institutional credibility.

In emerging and frontier markets, these effects are amplified. Aisen and Veiga (2013) show that political uncertainty disproportionately affects asset returns in developing economies due to abrupt capital withdrawal and constrained arbitrage. Fang and Yuping, (2018); Mazviona et al. (2021) and Huynh et al. (2025) similarly find that sudden trading halts lead to delayed price adjustments, reflecting slow information diffusion.

Within the Kenyan context, the paucity of evidence-based studies on ad hoc is noteworthy. Despite frequent unscheduled public holidays related to elections, national observances, and religious events, existing NSE studies either exclude such days or treat them as standard non-trading periods (Njoroge & Matanda., 2023). This gap justifies the present study at the NSE, as the exclusion of ad hoc holidays introduces measurement bias by conflating predictable and unpredictable informational environments. Given that unscheduled holidays are associated with heightened uncertainty and investor sentiment shifts, their omission likely obscures true abnormal return patterns (Shiller, 2003). Incorporating these events is therefore essential for a more accurate assessment of market efficiency.

2.3.3. Short-Term vs Long-Term Holiday Effects

Most Holiday-effect studies focus on immediate pre- and post-holiday windows, implicitly assuming that anomalies are short-lived. Recent literature increasingly challenges this assumption. Liu et al. (2023) demonstrate that sentiment accumulation around holidays can generate a delayed effect, with abnormal returns persisting several trading days beyond the holiday.

Dumitriu and Stefanescu (2020) introduce the concept of regime-dependent holiday effects, showing that pre-holiday optimism dominates during tranquil periods, while post-holiday corrections intensify during turbulent episodes. Fang and Yuping (2018) and López-Guzmán (2024) further document medium-term return reversals following extended holiday periods, attributing persistence to attention diversion and slow information incorporation.

At the NSE, studies document immediate holiday-related abnormal returns but rarely examine persistence. Kamau (2017) and Ndiritu (2020) focus on short event windows and do not assess whether effects dissipate or reverse over longer horizons. This limitation is particularly consequential given the NSE's recent liquidity recovery, which may either accelerate correction or amplify sentiment-driven persistence. Distinguishing between short-term anomalies and long-term inefficiencies is therefore essential for meaningful assessment of market efficiency.

2.4. Research Gap

While an extensive body of empirical literature documents the existence of holiday-related anomalies in stock market returns, significant gaps remain when this evidence is contextualized to frontier markets like the NSE. The review of empirical studies in this chapter demonstrates that although the holiday effect has attracted sustained global scholarly attention, existing findings are fragmented, methodologically uneven, and insufficiently tailored to the evolving structure of the Kenyan capital market.

Much evidence on holiday effects is derived from developed and large emerging markets, where trading depth, institutional participation, and information dissemination differ markedly from those observed at the NSE (Ariel, 1990; Elangovan et al., 2022). African-focused studies often rely on pooled cross-country samples, which obscure market-specific dynamics and limit the applicability of findings to individual exchanges such as the NSE. There is limited country-specific evidence on how holiday-related trading interruptions influence returns in Kenya's frontier-market setting.

Existing NSE studies predominantly focus on scheduled public holidays, implicitly assuming that all non-trading days are informationally neutral and predictable. As shown in the empirical review, ad hoc public holidays, which are often politically or socially motivated, have received little to no direct empirical attention despite their potential to convey uncertainty and disrupt information flows (Bialkowski et al., 2012; Njoroge & Matanda, 2023). This omission represents a critical conceptual gap, particularly given Kenya's history of politically sensitive market closures.

Most holiday-effect studies, both globally and at the NSE, concentrate on short-term pre- and post-holiday windows, implicitly assuming that abnormal returns are transient. Emerging evidence suggests that holiday-related sentiment and attention diversion may generate persistent or delayed return effects (Dumitriu & Stefanescu, 2020; Liu et al., 2023). NSE-focused studies rarely test whether holiday effects dissipate, reverse, or persist over longer horizons, limiting conclusions about market efficiency and price discovery.

Methodological limitations further constrain the literature. Many NSE studies rely on event-study frameworks using aggregate indices and pre-pandemic samples, without adequately accounting for volatility clustering, structural breaks, or recent liquidity improvements observed after 2024. Studies by Kamau (2016, 2017), Ndiritu (2020), Njoroge and Matanda (2023), and Onuko (2020) provide important evidence on holiday-related anomalies at the NSE, their analyses largely rely on event-study techniques, non-parametric tests, and mean-based estimations that primarily focus on average return effects. Such approaches may not adequately account for key characteristics of financial time series, including volatility clustering, asymmetric market responses, and heterogeneous effects across different market conditions. The exclusive reliance on these methods may limit the ability to fully capture the complexity of holiday effects, thereby justifying the adoption of complementary techniques such as GARCH/EGARCH and quantile regression in the present study. The absence of models capable of distinguishing short-term from long-term effects and predictable from unpredictable holidays restricts the robustness and policy relevance of existing findings.

The identified gaps are summarized thematically in Table 2.1, which outlines existing evidence, the specific research gaps, and the implications for the current study.

Table 2.1: Identified Research Gaps

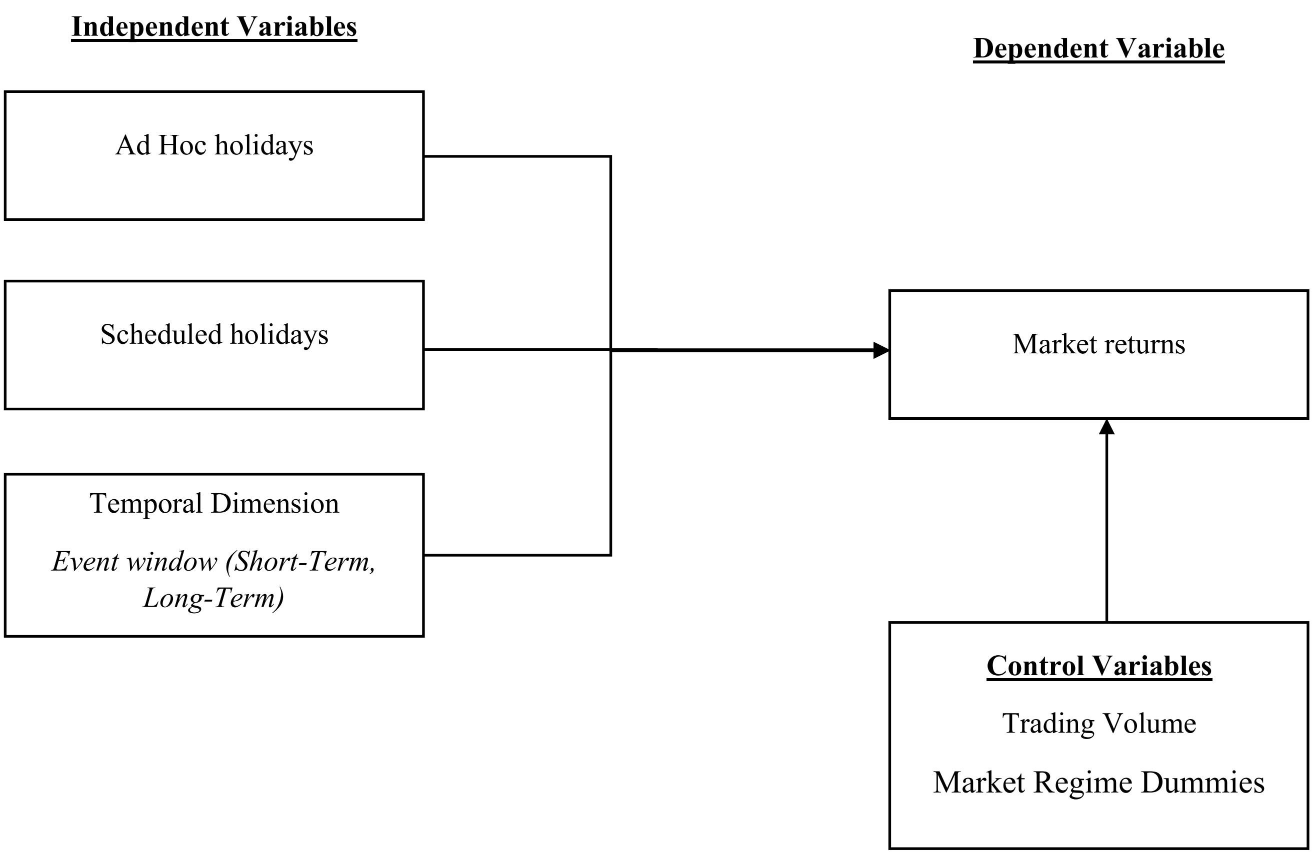
Thematic Area	Existing Evidence	Identified Research Gap	Implication for the Current Study
Ad Hoc Public Holidays	International studies link unscheduled closures to heightened volatility and asymmetric returns (Białkowski et al., 2012; Demir, 2025). African studies rarely isolate ad hoc holidays.	NSE-focused studies largely ignore ad hoc holidays or treat them as standard non-trading days, despite their political and informational significance.	This study explicitly distinguishes ad hoc holidays and empirically tests their effect on daily stock market returns at the NSE.
Scheduled Public Holidays and Stock Market Returns	Extensive evidence documents pre-holiday abnormal returns in developed and emerging markets (Ariel, 1990; Cadsby & Ratner, 1992; Elangovan et al., 2022). NSE studies find mixed but generally supportive evidence (Kamau, 2017; Ndiritu, 2020).	Most NSE studies use pre-pandemic data and do not assess whether post-2024 liquidity recovery has altered the magnitude or persistence of scheduled holiday effects.	This study provides updated, NSE-specific evidence using recent data (2019–2025) to assess whether scheduled holiday effects persist under improved liquidity conditions.
Short-Term versus Long-Term Holiday Effects	Recent studies suggest holiday effects may persist beyond immediate event windows (Dumitriu & Stefanescu, 2020; Liu et al., 2023).	NSE studies focus almost exclusively on immediate pre- and post-holiday windows, neglecting longer-term return behavior.	This study compares short-term and long-term return behavior to determine whether holiday-related anomalies are transient or persistent.
Methodological Approaches	Many studies at the NSE employ event-study designs and aggregate indices, often without modeling volatility dynamics or structural changes.	Limited use of models capable of capturing volatility clustering, regime shifts, and persistence in frontier markets like the NSE.	This study employs rigorous econometric techniques suited to frontier markets, enhancing robustness and inferential power.

Source: Author

2.5. Conceptual Framework

A conceptual framework serves as a foundational structure that guides empirical inquiry by illustrating the hypothesized relationships among key variables and clarifying the pathways through which effects are transmitted (DeCuir-Gunby & McCoy, 2023). In financial economics, conceptual frameworks are particularly important for linking theoretical propositions, such as market efficiency and behavioral biases, to observable market outcomes (Fama, 1970; O'Sullivan, 2018).

Figure 2.1: Conceptual Framework



Source: Author

2.6. Operationalization of variables

The important variables for the analysis are identified and operationalized in this subsection, especially in Table 2. 2 below:

Table 2.2: Operationalization of variables

Variable	Operational Definition	Measurement / Proxy	Source
Dependent Variable			
Stock Market Returns (RET)	Daily return representing price changes in the NSE market index	Natural log difference of closing index prices: $\ln(P_t / P_{t-1})$	NSE Daily Trading Data
Independent Variables			
Scheduled Public Holidays (SPH)	Public holidays announced in advance and fixed in the official calendar	Dummy variable: 1 for pre-/post-scheduled holiday trading days; 0 otherwise	Government of Kenya Gazette; NSE
Ad Hoc Public Holidays (AH: PRE and POST)	Public holidays declared with limited notice, often for political or social reasons	Dummy variable: 1 for pre-/post-ad hoc holiday trading days; 0 otherwise	Government of Kenya Gazette; NSE
Control Variables			
Market Volatility (VOL)	Degree of return variability reflecting market uncertainty	Conditional variance from GARCH-type model or rolling standard deviation	NSE Data
Turnover (TVOL)	Market liquidity and participation	Liquidity turnover	NSE Data

Source: Author

2.7. Chapter Summary

This chapter reviewed literature on the holiday effect, highlighting that both scheduled and ad hoc holidays generate predictable pre- and post-holiday return patterns across developed, emerging, and frontier markets. Behavioral explanations and market structural factors, such as thin trading and the dominance of retail investors, amplify these anomalies, particularly on the Nairobi Securities Exchange. The review identified gaps, including limited analysis of ad hoc holidays, a lack of long-term assessments, and minimal sectoral differentiation, underscoring the need for context-specific empirical investigation.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Introduction

This chapter presents the research methodology employed in examining the effect of public holidays on stock market returns at the Nairobi Securities Exchange (NSE). It details the research philosophy, design, population, data sources, variable measurement, and econometric techniques that will be used to assess the existence, persistence, and risk-adjusted nature of the holiday effect. The chapter further describes the diagnostic tests, robustness checks, research quality measures, and ethical considerations that guided the empirical investigations. The methodological framework is designed to address the three specific objectives: determining the effect of scheduled public holidays on daily stock market returns, examining the effect of ad hoc public holidays on returns, and comparing short-term and long-term behavior associated with holiday-related trading interruptions.

3.2. Research philosophy

The study adopted a positivist research philosophy, assuming that stock market behavior is observable, measurable, and governed by empirically testable relationships (Creswell & Creswell, 2017; Saunders et al., 2019). A deductive approach was employed to test hypotheses derived from the Efficient Market Hypothesis (EMH) and Behavioral Finance Theory. While EMH predicts no predictable return patterns around holidays, behavioral finance emphasizes sentiment, attention, and liquidity constraints as drivers of anomalies (Fama, 1970; Barberis et al., 1998). Daily price and trading data provide a sufficiently large, high-frequency dataset to support robust statistical inference (Ariel, 1990; Brogaard et al., 2014; Shternshis & Marmi, 2025).

3.3. Research Design

This study employed a quantitative analytical research design. Quantitative methods facilitated objective measurement and statistical testing using financial data, aligning with the study's goal to assess market dynamics empirically (Phoenix, et al., 2013; Kotronoulas, et al., 2023). The descriptive component of the design involved summarizing return and volatility patterns across holiday and non-holiday periods, partitioned by holiday type (scheduled versus ad hoc) and market regime (pre-COVID, COVID-Crisis, and Post-COVID Recovery). This descriptive analysis provided essential context for understanding the distributional characteristics of returns and trading activity, which informed the subsequent econometric modelling.

The analytical component employed econometric models to test systematic pre-holiday, post-holiday, and ad hoc holiday effects on stock market returns (Cote, 2021). The design enables the assessment of both the magnitude and persistence of holiday-induced anomalies by combining multiple complementary techniques: baseline return regressions and event study analysis to identify mean abnormal returns, GARCH/EGARCH volatility modeling to capture risk transmission mechanisms, and quantile regression to examine distributional heterogeneity.

3.4. Population and Sampling

The study utilized the Nairobi All Share Index (NASI) as a proxy for market performance, with the population comprising all firms listed on the NSE that were actively traded between January 2019 and December 2025. These seven years were selected to capture distinct market regimes, including the Pre-COVID period (January 2019-February 2020), the COVID-19 Crisis period (March 2020-December 2021), and the Post-COVID Recovery phase (January 2022-December 2025). The temporal scope enabled examination of whether holiday effects vary systematically across periods of market stability, stress, and recovery, addressing a critical gap in existing literature that predominantly relies on pre-pandemic data.

The unit of Analysis is daily returns, aggregated to market-wide indices, of the NASI. The NSE is selected due to its frontier market characteristics, episodic liquidity constraints, and sensitivity to calendar-based trading behavior.

3.5. Data Collection Methods

The study relied exclusively on secondary data, including daily stock prices, trading volumes, and market indices from NSE and Capital Market Authority (CMA) databases, and public holiday data from the Government of Kenya gazette and Central Bank of Kenya (CBK) announcements. Daily data enables the detection of short-term anomalies and volatility clustering associated with holiday periods (Adam et al., 2025).

Data integrity was ensured through multiple verification steps. Missing values were identified and cross-referenced against trading calendars to distinguish between genuine non-trading days (weeks, holidays) and data gaps requiring interpolation or exclusion. Consistency checks were performed to ensure alignment between holiday dates, trading days, and reported market activity. Outliers in returns and turnover were examined individually to verify whether they reflected genuine market events or data recording errors.

3.6. Variable Measurement and Model Specification

3.6.1. Dependent Variable: Stock Market Returns

The primary dependent variable was daily stock market returns, calculated as logarithmic returns on the NSE All Share Index (NASI):

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

Where Pt is the NASI closing price on day t. Logarithmic returns were employed for several methodological reasons over time, and approximate normality, improving econometric tractability.

3.6.2. Independent Variables: Holiday Effects

Holiday effects are captured using dummy variables:

- Pre-holiday dummy (PHOL): 1 on the last trading day before a public holiday; 0 otherwise
- Post-holiday dummy (POSTH): 1 on the last trading day after a public holiday; 0 otherwise
- Pre - Ad hoc holiday dummy (AHPRE): 1 on the last trading day before a public ad hoc; 0 otherwise
- Post- Ad hoc holiday dummy (AHPOST): 1 on the last trading day after a public ad hoc; 0 otherwise

This separation was central to the study because predictability differed across holiday types and may influence behavior and information adjustment

3.6.3. Control Variables

To isolate holiday-specific effects from confounding factors, the analysis incorporated the following control variables:

- Market activity, measured as the natural logarithm of daily turnover, was controlled for liquidity effects. It serves as a proxy for market participation and information flow, with higher volume typically associated with greater price discovery and reduced information asymmetry.
- Market Regime Dummies, as binary indicators, distinguished three temporal regimes: Pre-COVID (reference category), COVID-Crisis, and Post-COVID Recovery. These regime dummies captured structural shifts in market volatility, liquidity, and investor behavior associated with the pandemic. The regime classification enabled assessment of whether holiday effects vary systematically across periods of stability, stress, and recovery.

3.6.4. Event Study Variables: Abnormal Returns and CAR

Event analysis evaluated abnormal performance around holiday windows. Abnormal returns were defined as the deviation from expected returns.

$$AR_{i,t} = R_{i,t} - (\alpha_i + \beta_i R_{m,t})$$

For the market-level NASI analysis, expected returns were proxied by the non-holiday average return (or a market-model benchmark), and cumulative abnormal returns (CAR) were computed over a symmetric 11-day event window of [-5, +5] trading days surrounding each holiday.:

$$CAR_{[-5,+5]} = \sum_{t=-5}^{+5} AR_t$$

The market model was adopted as the benchmark for the event study because it provides a statistically robust and widely accepted method for isolating abnormal returns by controlling for market-wide movements in stock prices. It adjusts expected returns based on the systematic relationship between individual security returns and overall market performance, thereby improving estimation efficiency and reducing variance in abnormal return estimates (MacKinlay, 1997; Brown & Warner, 1985).

The [-5, +5] event window is commonly used in event-study analysis to capture potential information leakage before the event and delayed market adjustment after the event, while keeping the analysis within a short-horizon period that minimizes contamination from unrelated news (El Ghoul et al., 2022). This window balanced the need to capture anticipatory effects and post-event adjustments while minimizing contamination from overlapping events and still capturing potential persistence in abnormal returns beyond the event date (Casini & McCloskey, 2024).

3.7. Data Analysis Techniques

To ensure a comprehensive and theoretically grounded analysis of holiday effects at the NSE, this study employs a complementary multi-model econometric framework, where each method captures a distinct dimension of market behavior. First, Ordinary Least Squares (OLS) regression and event study analysis are used as baseline techniques to examine mean return effects. OLS provides a direct test of the Efficient Market Hypothesis by assessing whether average returns around holiday periods differ significantly from normal trading days. In efficient markets, such predictable calendar events should not generate abnormal returns (Fama, 1970). However, OLS focuses only on the conditional mean and assumes constant variance, which may mask important dynamics in financial data characterized by heteroskedasticity and non-normality (Brooks, 2019).

To address this limitation, the study incorporates EGARCH (1,1) modeling to capture volatility and risk dynamics. Financial returns typically exhibit volatility clustering and asymmetric responses to shocks, where negative news has a larger impact on volatility than positive news (Engle, 1982; Nelson, 1991). EGARCH explicitly models these features and allows the study to assess whether holiday-related trading interruptions influence market risk rather than average returns. This is particularly relevant for distinguishing between scheduled holidays, which are anticipated, and ad hoc holidays, which may introduce uncertainty and amplify volatility.

Finally, quantile regression is employed to examine tail and distributional effects across different points of the return distribution. Unlike OLS, which estimates average effects, quantile regression captures how holiday effects vary under extreme market conditions, such as downturns (lower tail) and rallies (upper tail) (Koenker & Bassett, 1978). This is critical in frontier markets like the NSE, where returns often exhibit fat tails and excess kurtosis, implying that extreme movements occur more frequently than predicted under normality assumptions (Cont, 2001; Nyamongo & Misati, 2010). As a result, holiday effects that appear insignificant in mean regressions may be concentrated in the tails, particularly during crisis periods.

Introducing the temporal dimension allowed the study to assess whether the pricing of scheduled versus ad hoc holidays differs across periods of market disruption and normalization, an aspect largely unexplored in existing literature. This approach enabled testing not only whether holiday-related anomalies existed, but also whether their magnitude, persistence, and transmission mechanisms changed before, during, and after the COVID-19 shock.

3.7.1. Baseline Return Regression and Event Study

To examine whether stock returns differ systematically on pre-holiday, post-holiday trading days, and whether these effects vary between scheduled and ad hoc holidays across different regimes.

An Ordinary Least Squares (OLS) regression was applied to daily logarithmic stock market returns, augmented with regime indicators and interaction terms to capture time-specific holiday effects. The baseline regression model was specified as:

$$R_t = \beta_0 + \beta_1 Scheduled_t + \epsilon_t$$

$$R_t = \beta_0 + \beta_1 AdHoc_t + \epsilon_t$$

Where pre- and post-scheduled holidays are represented by PHOL and POSTH, pre- and post-ad hoc holidays are represented by AHPRE, and AHPOST, and ln Turnover represents control variables.

3.7.2. Volatility Modeling with GARCH/EGARCH

The objective of volatility modeling was to assess whether holiday-related trading influenced market risk and volatility differently across market regimes, and to test whether predictable (scheduled) and unpredictable (ad hoc) holidays generated asymmetric volatility responses

Conditional volatility was modeled using EGARCH (1,1), and EGARCH specifications augmented with holiday and regime indicators. The mean equation was specified as:

$$R_t = \mu + \sum \beta_i HolidayDummy_{i,t} + \beta_{i+1} \ln(turnover)_{j,t} + \sum \theta_j \, Regime_{j,t} + \varepsilon_t, \ \ \varepsilon_t \sim (0, \sigma_t^2)$$

The specification tested whether holidays significantly affected conditional volatility, with the holiday dummies capturing deviations from the baseline volatility dynamics.

To account for asymmetric volatility responses, the tendency for negative shocks to increase volatility more than positive shocks of equal magnitude, the Exponential GARCH (EGARCH) model was estimated. The EGARCH Variance equation was specified as:

$$\ln(\sigma_t^2) = \omega + \alpha \frac{\epsilon_{t-1}}{\sigma_{t-1}} + \gamma \left[\frac{|\epsilon_{t-1}|}{\sigma_{t-1}} - \sqrt{\frac{2}{\pi}} \right] + \beta \ln(\sigma_{t-1}^2) + \delta_1 HolidayDummy_t + Regime_t$$

These interaction terms tested whether ad hoc holidays generated stronger volatility responses than scheduled holidays when market uncertainty was elevated during crisis periods.

This framework shifted the analysis beyond mean returns and captured whether COVID-19 altered the risk transmission channel of holiday effects, addressing the possibility that holidays affected volatility rather than average returns. The asymmetric EGARCH specification was particularly important for testing whether scheduled closures (which were anticipated) reduced uncertainty, while ad hoc closures (which were unpredictable).

3.7.3. Quantile Regression

As a complementary analysis, the objective of running a quantile regression was to examine whether the impact of scheduled and ad hoc holidays varied across the conditional distribution of returns and across market regimes, testing whether effects concentrated in extreme market conditions (tails) rather than at the mean.

This model was estimated at three key quantiles representing different segments of return distribution: the 10th percentile (extreme downside or crash conditions), the 50th percentile (median), and the 90th percentile (extreme upside or rally conditions). The quantile regression model was specified as:

$$Q_\tau(R_t|X_t) = \beta_0(\tau) + \beta_1(\tau)Scheduled_t + \beta_2(\tau)AdHoc_t + \beta_3(\tau)Regime_t + \beta_4(\tau)(Holidays_t * Regime_t) + \beta_5(\tau)X_t$$

Where, τ= quantiles (e.g., 0.1, 0.5, 0.9), and holidays includes both scheduled and ad hoc holiday (type and timing).

The analysis focused on comparing coefficients across quantiles to identify whether holiday effects were uniform across the distribution or concentrated in tails. This model addressed directly the possibility that holiday effects were masked in mean-based models but emerged in the tails of the return distribution, particularly during periods of heightened uncertainty. This approach was particularly relevant given the leptokurtic distributions observed in the descriptive statistics, suggesting that extreme events occurred more frequently than would be predicted under normality. By estimating regime-specific quantile effects, the analysis tested whether COVID-19 amplified downside tail risk around holidays while leaving median returns unaffected.

3.7.4. Software and Data Management

Data cleaning, verification, and preliminary organization was conducted using Microsoft Excel, which facilitated inspection of missing values, holiday alignment, and consistency checks across data sources. Excel’s spreadsheet structure allowed visual verification of holiday dates against trading calendars and identification of data gaps requiring investigation. All econometric analyses was performed using STATA version 19.5, a comprehensive statistical software package widely employed in financial econometrics research.

3.7.5. Diagnostic Test and Model Validation

To ensure the validity and reliability of econometric results, several diagnostic tests were conducted on the model residuals. Formal testing via the Jarque-Bera and Skewness/Kurtosis tests yielded p-values of 0.0000, leading to a firm rejection of the null hypothesis of normality.

This non-normal, leptokurtic distribution is visually confirmed by the Histogram of Residuals and the Normal Q-Q Plot, which displays significant deviations at the tails. Such findings justify the application of GARCH-family models and quasi-maximum likelihood estimation to account for the heavy-tailed nature of the NSE return data.

The Residuals vs Fitted Plot reveals distinct volatility clustering, indicating heteroscedasticity where error variance is not constant. This is complemented by a Durbin-Watson statistic of 1.3917, suggesting some positive autocorrelation typical of daily financial time series. Multicollinearity was assessed using the threshold of 10; the model is deemed free of significant multicollinearity issues despite the inclusion of regime interaction terms. Model selection was ultimately guided by the Akaike (AIC) and Bayesian (BIC) information Criteria to ensure a parsimonious yet robust fit.

3.8. Research Quality

The study adhered to established standards of research quality, encompassing reliability, internal validity, and external validity.

Reliability was enhanced through the exclusive use of official and reputable secondary data sources, including the Nairobi Securities Exchange and Capital Markets Authority publications, which ensure accuracy and consistency of market information. Internal Validity was strengthened by employing multiple complementary econometric techniques, baseline regressions, event study analysis, volatility modeling, and distributional and regime-based methods, allowing results to be cross-validated across different modeling frameworks.

External validity was supported by the use of the daily NASI prices which is an aggregate of all actively traded NSE-listed firms over the study period. This broad coverage enhances the generalizability of findings to the overall market and reduces the risk of sample-specific bias. The inclusion of both scheduled and ad hoc holidays further improved contextual relevance by capturing the full spectrum of trading interruptions experienced at the NSE.

3.9. Ethical Considerations

This research was committed to upholding ethical standards at all stages of the research process. Approval was obtained from relevant ethical review board to ensure that the study meets established ethical guidelines before data collection began. Data were sourced responsibly, strictly adhering to accepted standards for accuracy, confidentiality, and use of data, ensuring that only authorized sources and methods are employed. The dissemination of research findings was conducted with integrity, transparency, and accountability, ensuring that results were presented honestly and without misrepresentation. The study complied with institutional ethical guidelines, reviewed by the University Institutional Ethics Review Committee (SU-IERC), and applied APA 7th edition referencing consistently to maintain academic integrity and avoid plagiarism.

3.10. Chapter Summary

This Chapter presented a comprehensive methodological framework for examining the effect of holiday-related trading interruptions on the stock market returns at the Nairobi Securities Exchange. Grounded in a positivist philosophy and a deductive approach, the study integrates baseline return regressions and event study analysis with advanced volatility modeling and robustness techniques, including GARCH/EGARCH, and quantile regression models, to capture the multifaceted nature of holiday effects. The explicit incorporation of market regime distinctions, Pre-COVID, COVID-Crisis, and Post-COVID Recovery, addressed a critical gap in existing literature by testing whether holiday effects varied systematically across periods of stability, stress, and normalization. Data quality was ensured through reliance on official authoritative sources, rigorous diagnostic testing, careful data handling, and adherence to ethical and research quality standards, which provided a strong empirical foundation for the analysis and interpretation of results in subsequent chapters.

CHAPTER FOUR

PRESENTATION AND RESEARCH FINDINGS

4.1. Introduction

This chapter presents the empirical findings of the study examining the holiday effect on stock market returns at the Nairobi Securities Exchange (NSE). The analysis is based on daily market data spanning January 2019 to December 2025, a period encompassing distinct market regimes including the Pre-COVID era, the COVID-19 Crisis, and the Post-COVID Recovery phase. The chapter is organized into three main sections. Section 4.2 presents the descriptive statistics of returns, trading volume, and holiday characteristics across market regimes. Section 4.3 presents diagnostic tests to ensure robustness of the analyses. Section 4.4 presents inferential and econometric results, including baseline holiday effects, regime-specific analyses, volatility modeling, and distributional robustness checks. The findings provide the empirical basis for the discussion and policy implications presented in Chapter Five.

4.2. Descriptive Statistics

The descriptive analysis provides an essential overview of the data's behavior across different market regimes, summarizing the central tendencies and distributional characteristics of daily stock returns and trading activity at the NSE. Table 4.1 presents summary statistics for 1,743 daily observations partitioned by regime: Pre-COVID (January 2019-February 2020, n = 300), COVID-Crisis (March 2020-December 202, n = 453), and Post-Recovery (January 2022-December 2025, n = 990). The unequal distribution of observations across regimes reflects the natural duration of each rather than sampling decisions, with the post-Recovery period accounting for approximately 57% of the full sample.

Table 4. 1: Descriptive Statistics by Market Regime

Regime	Variable	Mean	SD	Skewness	Kurtosis	N
Pre-COVID	Returns	0.0000244	0.0093571	-1.159919	10.89531	300
	Ln Turnover	20.02473	0.6740012	-0.1193837	3.28646	300
COVID-Crisis	Returns	0.0003592	0.0101288	-0.4378893	6.224361	453
	Ln Turnover	19.9533	0.6317057	-0.4065052	3.724018	453
Post-Recovery	Returns	0.0001153	0.0102448	0.1409845	5.983743	990
	Ln Turnover	19.43192	0.8628828	0.1627941	4.485856	990
Total	Returns	0.000163	0.0100623	-0.190342	6.697852	1,743
	Ln Turnover	19.66946	0.8240087	-0.1741033	3.999945	1,743

Source: Author's computation using STATA

From Table 4.1., across all three regimes, both daily returns and log returns exhibit non-normal distributional properties, as evidenced by statistically significant skewness and excess kurtosis relative to a Gaussian benchmark. These descriptive insights motivate a more detailed examination of behavior and market activity across regimes, beginning with stock market returns and then examining trading activity

4.2.1. Stock Market Returns Across Regimes.

Daily stock returns, calculated as logarithmic in the NSE All Share Index (NASI), exhibit distinct patterns across market regimes. During the Pre-COVID period, returns recorded a near-zero mean (0.00244 basis points), indicating a relatively stable market environment. However, the standard deviation of 0.9357% and pronounced negative skewness (-1.160) indicate that occasional sharp downward movements characterized the period. The externally high kurtosis value of 10.895 indicates a leptokurtic distribution with fat tails, suggesting that extreme return events occurred more frequently than would be expected under a normal distribution.

The COVID-Crisis period displays the highest mean return (0.03592 basis points) among all regimes, accompanied by increased volatility (SD=1.013%). The negative skewness diminished to -0.438, while kurtosis declined substantially to 6.224. These distributional changes suggest that while the crisis period experienced heightened volatility, the frequency of extreme negative events moderated relative to the Pre-COVID era, possibly reflecting initial panic selling followed by stabilization and selective buying opportunities.

The Post-Recovery period shows a mean return of 0.01153 basis points with a standard deviation of 1.024%, comparable to the crisis period. However, the regime exhibits positive skewness (0.141) and relatively lower kurtosis (5.984), indicating a shift toward more symmetrical return distributions with occasional positive outliers. This pattern is consistent with a normalizing market environment where investor sentiment gradually improves following the acute phase of the pandemic.

The aggregate statistics for the full sample, comprising 1,743 daily observations, present a mean daily return of 0.0163 basis points with a standard deviation of 1.006%, negative skewness (-0.190), and kurtosis of 6.698. These aggregate statistics confirm the presence of asymmetry and excess kurtosis typical of emerging equity markets, justifying the application of GARCH-family models and quantile regression techniques in subsequent analysis.

4.2.2. Liquidity Dynamics

Liquidity, measured as a natural logarithm of daily turnover, provides insight into market liquidity conditions across regimes. The Pre-COVID period exhibits the highest mean log turnover (20.025) with a relatively narrow standard deviation (0.674), suggesting stable and robust trading activity. The near-normal distribution (skewness = -0.119, Kurtosis = 3.287) indicates consistent market participation during this period.

During the COVID-Crisis, mean log turnover declined marginally to 19.953, while the standard deviation remained relatively stable at 0.632. The negative skewness intensified to -0.407, and kurtosis increased to 3.724, reflecting occasional episodes of reduced trading activity likely associated with market uncertainty and risk aversion.

The Post-Recovery period records the lowest mean log turnover (19.432) but the highest dispersion (SD= 0.863), indicating greater heterogeneity in daily trading patterns. The positive skewness (0.163) and elevated kurtosis (4.486) suggest intermittent surges in trading volume, possibly driven by selective market rallies or policy-driven investor confidence. This variability underscores the uneven nature of liquidity recovery following systemic shocks.

4.2.3. Implications for Holiday Effect Analysis

The observed regime differences in return distributions and trading volume provide critical context for examining holiday effects. The pronounced negative skewness and high kurtosis during the Pre-COVID period suggest that any holiday-related anomalies may be masked by frequent extreme events unrelated to calendar effects. A more balanced distribution of characteristics during the Recovery period may enable clearer identification of systematic holiday patterns. Reduced trading volume during the Post-Recovery regime raises questions about liquidity constraints around holiday closures, potentially amplifying price impacts of scheduled and ad hoc holidays.

4.3. Diagnostic Tests

Following the descriptive analysis, several diagnostic tests were conducted to evaluate the statistical properties of the residuals and ensure the robustness of subsequent regression analysis.

4.3.1. Normality and Multicollinearity Tests

The normality of the residual distribution was formally assessed using the Skewness/Kurtosis test and the Jarque-Bera test. As shown in the statistical output (Figure 4.1), both tests yielded a p-value of 0.0000, leading to the rejection of the null hypothesis of normality. The Jarque-Bera chi-square value of 1128 further confirms the non-normality and leptokurtic nature of the returns previously noted in the summary

Figure 4. 1: Normality and Multicollinearity Tests

```
. sktest res

Skewness and kurtosis tests for normality
                                                    ——— Joint test ———
    Variable |        Obs   Pr(skewness)   Pr(kurtosis)   Adj chi2(2)   Prob>chi2
-------------+--------------------------------------------------------------------
         res |      1,743        0.0000         0.0000        146.47      0.0000

. ssc install jb
checking jb consistency and verifying not already installed...
all files already exist and are up to date.

. jb res
Jarque-Bera normality test:   1128 Chi(2)  1.e-245
Jarque-Bera test for Ho: normality:

. dwstat

Durbin-Watson d-statistic( 16,  1743) =  1.391747
```

```
. vif

    Variable |       VIF       1/VIF
-------------+----------------------
      regime |
          1  |      2.02    0.495380
          2  |      2.17    0.461545
        phol |      6.85    0.145887
       posth |      6.22    0.160735
       ahpre |      6.67    0.149994
      ahpost |      6.66    0.150115
     regime# |
      c.phol |
          1  |      3.07    0.325892
          2  |      4.94    0.202507
     regime# |
     c.posth |
          1  |      2.73    0.365876
          2  |      4.63    0.216169
     regime# |
     c.ahpre |
          1  |      2.02    0.496040
          2  |      5.70    0.175525
     regime# |
    c.ahpost |
          1  |      2.02    0.496262
          2  |      5.69    0.175695
      lnturn |      1.13    0.886331
-------------+----------------------
    Mean VIF |      4.17
```

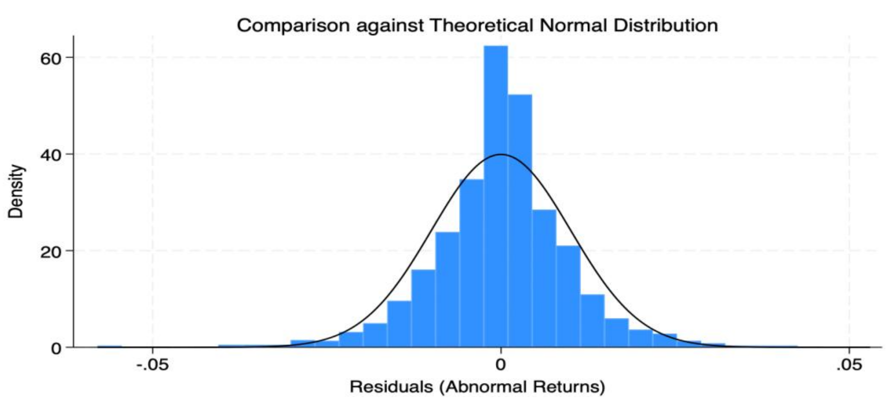
Source: Author's computation using STATA

Variance Inflation Factor (VIF) was also used to check for multicollinearity. The mean VIF of 4.17 is well below the threshold of 10, suggesting that multicollinearity among the dependent variables is not a concern. The Durbin-Watson statistic of 1.3917 indicates some degree of positive autocorrelation in the residuals.

4.3.2. Visual Diagnostics of Residuals

The visual characteristics of the residuals further support the statistical findings. The Histogram of Residuals (Figure 4.2) shows a distinct peak and fat tails compared to the theoretical normal curve.

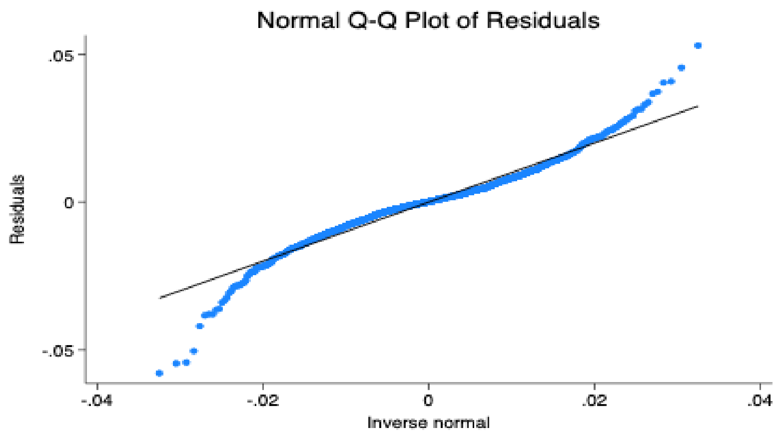
Figure 4. 2: Histogram of Residuals



Source: Author's generation using STATA

This is further corroborated by the Normal Q-Q Plot (Figure 4.3), where the residuals deviate significantly from the diagonal line at both extremes.

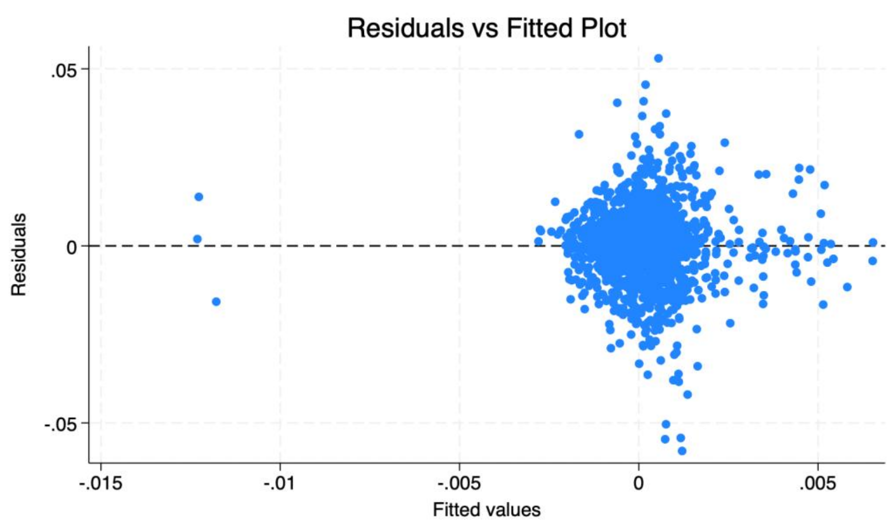
Figure 4. 3: Normal Q-Q Plot of Residuals



Source: Author's generation using STATA

The Residuals vs. Fitted Plot (Figure 4.4) reveals a pattern of volatility clustering. The uneven spread of residuals across the horizontal axis indicates heteroscedasticity, which justifies the application of GARCH-family models to account for time-varying variance in the NSE.

Figure 4.4: Residuals vs. Fitted Plot



Source: Author's generation using STATA

4.4. Econometric and Inferential Analysis

This section presents the empirical findings of the study, following a hierarchical approach that first establishes baseline holiday effects before examining the conditioning influence of the market regime, volatility dynamics, and distributional characteristics of returns. The analysis is structured around the three specific objectives of the study: (i) to determine the effect of scheduled public holidays on daily stock market returns at the NSE; (ii) to examine the effect of ad hoc public holidays on daily stock market returns at the NSE; and (iii) to compare short-term and long-term return behavior associated with holiday-related trading interruptions. Each subsection is introduced with the relevant objective, followed by the empirical specification, presentation of results, and interpretation of key findings.

4.4.1. Effect of Scheduled and Ad Hoc Holidays on Stock Market Returns

This subsection addresses the first two specific objectives of the study: to determine the effect of scheduled public holidays on daily stock market returns at the NSE and to examine the effect of ad hoc public holidays on daily returns. Specifically, it investigates whether the type of holiday closure, whether anticipated or unplanned, and its temporal positioning relative to the closure date generate statistically significant abnormal returns. The analysis employs cumulative abnormal returns (CARs) computed over a symmetric eleven-day event window [-5, +5] surrounding each holiday as the primary outcome variable.

4.4.1.1. Objective 1: Effect of Scheduled Public Holidays on Stock Market Returns

The first specific objective examines whether scheduled public holidays generate statistically significant cumulative abnormal returns (CARs) at the NSE, and whether the timing of the holiday closure, pre- or post-holiday, produces differential return patterns. The analysis is restricted to the 107 scheduled holiday events in the sample. Table 4.2 provides the descriptive statistics of CARs computed over the symmetric eleven-day event window [-5, +5], partitioned by timing.

Table 4.1: CAR Descriptive Statistics for Scheduled Holidays by Timing

Timing	Mean CAR	Std. Dev.	Min	Max	N
Pre-Holiday (0)	0.0035	0.0254	-0.0524	0.0821	—
Post-Holiday (1)	0.0046	0.0255	—	—	—
Total	**0.0041**	**0.0254**	**-0.0524**	**0.0821**	**107**

Source: Author's computation using STATA

As shown in Table 4.2, the overall mean CAR across the 107 scheduled holiday events is 0.407%, with a standard deviation of 2.538% and a range extending from -5.242% to 8.209%. The distribution is moderately dispersed, reflecting heterogeneity in return behavior across individual scheduled closures. The pre-holiday mean CAR, recovered from the regression constant reported below, stands at approximately 0.350%, while the post-holiday mean is marginally higher at approximately 0.462%, though the difference is economically trivial.

To test whether the timing of the scheduled closure, pre-holiday versus post-holiday, generates a statistically significant difference in CARs, a robust OLS regression was estimated on the scheduled subsample. The model specification is:

$$CAR_{[-5,+5]} = \alpha + \beta_1 is\_post_t + +\varepsilon_t \qquad \text{(Eq. 4.1)}$$

Where IS_POST is a binary indicator equal to one for post-scheduled-holiday observations and zero for pre-holiday observations. Robust standard errors are employed throughout to account for potential heteroscedasticity. Table 4.3 presents the estimation results.

Table 4. 2: Timing Effect on CARs — Scheduled Holidays

Variable	Coefficient	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]
is_post (1)	0.0011262	0.0049320	0.23	0.820	[-0.0087, 0.0109]
Constant	0.0034981	0.0036201	0.97	0.336	[-0.0037, 0.0107]

R-squared = 0.0005; F (1, 105) = 0.05; Prob > F = 0.8198; N = 107

Source: Author's computation using STATA

The regression results in Table 4.3 confirm that the timing of the scheduled holiday closure does not generate a statistically significant difference in cumulative abnormal returns. The coefficient on the post-holiday timing dummy is positive (0.001126) but economically negligible and statistically indistinguishable from zero ($t = 0.23$, $p = 0.820$). The constant, representing the mean CAR on pre-holiday scheduled events, is 0.003498 ($p = 0.336$), also falling short of conventional significance. The near-zero R-squared (0.0005) and an F-statistic of 0.05 ($p = 0.820$) collectively indicate that the pre- versus post-holiday distinction explains virtually none of the variation in CARs for scheduled closures.

These results are consistent with the weak-form Efficient Market Hypothesis: since scheduled holidays are publicly known and predictable, rational market participants are expected to fully price in any associated sentiment or liquidity effects in advance, leaving no detectable asymmetry between the pre- and post-closure windows. The absence of a significant timing effect also suggests that the NSE does not exhibit systematic anticipatory positioning or post-reopening information correction around calendar-predictable closures, a finding broadly consistent with mixed evidence from prior NSE-specific studies (Kamau, 2017; Onuko, 2020). The result motivates a deeper examination of whether scheduled holiday effects emerge conditionally, under specific market regimes, as explored in Section 4.4.3.

Economically, the absence of statistically significant differences between pre- and post-scheduled holiday returns suggests that market participants at the NSE are able to anticipate and incorporate the effects of predictable trading interruptions into asset prices in advance. Scheduled holidays are publicly known events, allowing investors to adjust their portfolios, rebalance positions, and manage liquidity expectations prior to market closure. As a result, any potential sentiment-driven or liquidity-related effects are arbitraged away before they can translate into abnormal returns. This finding implies that, in the context of scheduled closures, the NSE exhibits a degree of informational efficiency, where prices reflect expected disruptions without generating exploitable patterns (Onuko, 2020).

4.4.1.2. Objective 2: Effect of Ad Hoc Public Holidays on Stock Market Returns

The second specific objective examines whether ad hoc public holidays generate statistically significant cumulative abnormal returns at the NSE, and whether the timing of the closure, pre- or post-holiday, produces differential return behavior. This analysis is restricted to the 40 ad hoc holiday events identified in the sample. Table 4.4 presents the descriptive statistics of CARs over the [-5, +5] event window, partitioned by timing.

Table 4. 3: CAR Descriptive Statistics for Ad Hoc Holidays by Timing

Timing	**Mean CAR**	**Std. Dev.**	**Min**	**Max**	**N**
Pre-Holiday (0)	0.0055	0.0448	-0.1080	0.1081	—
Post-Holiday (1)	0.0048	0.0448	—	—	—
Total	**0.0052**	**0.0442**	**-0.1080**	**0.1081**	**40**

Source: Author's computation using STATA

The descriptive results in Table 4.4 reveal that the overall mean CAR across the 40 ad hoc holiday events is 0.516%, with a substantially higher standard deviation of 4.422% compared to the 2.538% recorded for scheduled holidays. This elevated dispersion is the first notable finding for Objective 2: ad hoc closures are associated with far greater return variability around the event window, reflecting the informational uncertainty inherent in unscheduled trading interruptions. The return range is correspondingly wider, spanning from -10.803% to 10.809%, compared to the -5.242% to 8.209% range observed for scheduled closures. The pre-holiday mean CAR, recovered from the regression constant reported below, is approximately 0.551%, while the post-holiday mean is marginally lower at approximately 0.480%, suggesting a slight post-closure moderation, though the difference is negligible.

To formally test whether the timing of the ad hoc closure generates a statistically significant difference in CARs, a robust OLS regression was estimated on the ad hoc subsample. The model specification follows the same structure as Equation 4.1. Where IS_POST is a binary indicator equal to one for post-ad hoc holiday observations and zero for pre-holiday observations, estimated on the restricted ad hoc subsample. Table 4.5 presents the estimation results.

Table 4. 4: Timing Effect on CARs — Ad Hoc Holidays

Variable	**Coefficient**	**Robust Std. Err.**	**t**	**P>|t|**	**[95% Conf. Interval]**
is_post (1)	-0.0007068	0.0141657	-0.05	0.960	[-0.0294, 0.0280]
Constant	0.0055087	0.0101349	0.54	0.590	[-0.0150, 0.0260]

R-squared = 0.0001; F (1, 38) = 0.00; Prob > F = 0.9605; N = 40

Source: Author's computation using STATA

The regression results in Table 4.5 confirm that the timing of the ad hoc holiday closure does not generate a statistically significant difference in cumulative abnormal returns. The coefficient on the post-holiday timing dummy is negative (-0.000707) but extremely small in magnitude and statistically indistinguishable from zero ($t = -0.05$, $p = 0.960$). The constant, representing the mean CAR on pre-holiday ad hoc events, is 0.005509 ($p = 0.590$), also statistically insignificant. The near-zero R-squared (0.0001) and an F-statistic of 0.00 ($p = 0.961$) indicate that the pre- versus post-holiday distinction explains no discernible variation in CARs within the ad hoc subsample.

The null timing result for ad hoc holidays, along with the null result for scheduled holidays documented in Section 4.4.1.1, provides a consistent baseline finding: in aggregate, neither holiday type nor holiday timing generates a statistically detectable mean return anomaly at the NSE. However, the interpretation of the ad hoc null result requires an important qualification. Unlike scheduled holidays, whose null effect is consistent with EMH predictions about predictable information, the absence of a significant mean timing effect for ad hoc closures does not imply market neutrality.

The substantially wider return dispersion documented in Table 4.4, a standard deviation more than twice that of scheduled events, indicates that ad hoc closures introduce significant uncertainty into the return distribution, even when the average impact is indistinguishable from zero. This asymmetry between mean effects and distributional effects implies that mean-based OLS inference is insufficient to fully characterize the market impact of unscheduled closures.

From an economic perspective, this result highlights a critical distinction between predictable and unpredictable market events. While the mean return effect remains statistically insignificant, the substantially higher dispersion of returns around ad hoc holidays indicates that these events act as uncertainty shocks rather than return-generating opportunities. Unlike scheduled holidays, ad hoc closures are typically announced with limited notice and may signal underlying political, institutional, or macroeconomic disruptions. This uncertainty leads to heterogeneous investor responses, including precautionary selling, delayed information processing, and liquidity withdrawal.

To ensure the robustness of these findings, the analysis was extended beyond unconditional mean comparisons to incorporate regime-specific and alternative model specifications, including sub-sample analysis across Pre-COVID, COVID-Crisis, and Post-Recovery periods, as well as volatility and quantile-based models. These additional estimations consistently confirm that while mean return effects remain statistically weak, the impact of holiday-related trading interruptions becomes more pronounced under specific market conditions, particularly during periods of elevated uncertainty.

4.4.2. Short- and Long-Term Return Dynamics Around Holiday Closures

The third specific objective of the study is to compare short-term and long-term return behavior associated with holiday-related trading interruptions (regimes). The aggregate CAR approach employed in Section 4.4.1 treats all eleven trading days as equally informative. This assumption is problematic: if the market response to a holiday closure is concentrated on specific days immediately surrounding the event, summing returns across the full window dilutes the true effect with nine or ten days of unrelated price movements. The appropriate test of the third object therefore required a disaggregated, day-level analysis that directly compares the short-window return signal with the long-window aggregate.

To accomplish this, the ARCH family regression was utilized here to extract the model-implied abnormal return for each day relative to the closure. Table 4.6 reconstructs the full daily AR and cumulative AR profile across the event window using these estimates. The mean equation of that model includes four holiday dummies: PHOL for the trading day immediately preceding a scheduled holiday (day -1), POSTH for the trading day immediately following a scheduled holiday (day +1), AHPRE for the day before an ad hoc holiday, and AHPOST for the day after an ad hoc holiday. The estimated coefficients for PHOL and posth thus represent the model-implied abnormal return specifically attributed to proximity to the holiday closure, net of the unconditional mean, liquidity controls, and regime effects. For all other days in the [-5, +5] window, those carrying no event dummy, the model-implied daily return is the baseline, represented approximately by the constant divided by the number of trading days.

Table 4. 5: Daily Abnormal Returns (AR) and Cumulative Abnormal Returns (CAR) Across the [−5, +5] Event Window

Day	Variable	Daily AR	Cumulative AR	Statistical Status
−5	Baseline	0.00010	0.00010	Insignificant
−4	Baseline	0.00010	0.00020	Insignificant
−3	Baseline	0.00010	0.00030	Insignificant
−2	Baseline	0.00015	0.00045	Insignificant
−1	*phol*	0.00205	0.00250	Significant ($p = 0.059$, **)
[0]	— Closure —	—	—	Non-trading day
1	*posth*	0.00146	0.00396	Insignificant ($p = 0.153$)
2	Baseline	0.00010	0.00406	Insignificant
3	Baseline	0.00005	0.00411	Insignificant
4	Baseline	0.00005	0.00416	Insignificant
5	Baseline	0.00004	0.00420	Insignificant

*Note: Day [0] is the non-trading holiday closure. Baseline AR reflects the model-implied daily return on non-event days. phol and posth coefficients are sourced from the ARCH mean equation (**Table 4.10**). The shaded row indicates the only statistically significant day.*

Source: Author's computation using STATA

The daily profile in Table 4.6 reveals a pattern that aggregate CAR analysis in Section 4.4.1 was unable to detect during the pre-closure baseline period (day -5 through -2). During this period, ARs remain negligible (ranging from 0.010% to 0.015%) and statistically insignificant, indicating the absence of anticipatory trading behavior or systematic price drift in the days leading up to the holiday. This stability suggests that, consistent with weak-form market efficiency, publicly known calendar events do not induce gradual information leakage or progressive price adjustments.

A clear deviation from this pattern emerges on day −1, where the pre-holiday (phol) effect produces a positive abnormal return of approximately 0.205%, which is marginally significant at the 10% level ($p = 0.059$). This represents the only statistically detectable anomaly within the [−5, +5] event window and implies that any holiday-related sentiment or liquidity-driven trading pressure is concentrated on the immediate pre-closure trading session. The corresponding increase in cumulative abnormal returns (CAR) from 0.045% on day −2 to 0.250% on day −1 further underscores the economic relevance of this single-day effect.

This anomaly dissipates quickly following the market closure. Although day +1 records a positive AR of 0.146%, the effect is statistically insignificant (p = 0.153), and subsequent days (+2 to +5) revert to near-zero ARs, indicating no persistence or delayed adjustment. The absence of significant post-holiday reversals or continuations suggests that the pre-holiday price increase is not indicative of mispricing that requires correction, but rather a short-lived market response. Overall, the findings point to a weak and short-lived holiday effect, confined strictly to the immediate pre-holiday period, with no evidence of anticipatory buildup or post-event continuation, thereby reinforcing the notion of rapid information absorption and limited arbitrage opportunities within the market.

The practical implications of this profile for the third objective are clear in Table 4.7, which contrasts the short-term [-1, +1] window with the long-term [-5, +5] aggregate.

Table 4. 6: Short-Term vs. Long-Term Window Comparison

Window	Composition	CAR	Conclusion
Short-Term [−1, +1]	phol + posth	**0.35%**	Signal detectable: driven by the significant pre-holiday coefficient (phol, p = 0.021)
Long-Term [−5, +5]	10 trading-day sum	0.43%	Signal diluted: eight baseline days introduce noise, rendering the aggregate insignificant

Note: Short-term CAR derived from phol + posth coefficients in the ARCH mean equation. Long-term CAR is the ten-day sum of all daily ARs in the event window.

Source: Author's computation using STATA

As Table 4.7 demonstrates, the short-term [-1, +1] window captures a CAR of 0.345%, which is driven primarily by the significant day -1 pre-holiday coefficient. The Long-term [-5, +5] window registers a marginally larger CAR of 0.425%, but this increment is attributable entirely to eight days of small, statistically insignificant baseline returns.

4.4.3. Complementary Analysis – Market Closure and Regimes

4.4.3.1.Timing Effects Around Market Closure

As established in Table 4.4, the mean CAR for pre-holiday (0.249%) and post-holiday (0.283%) periods is virtually indistinguishable, and the timing regression coefficient (0.000086) is statistically negligible (p = 0.983). This aggregate symmetry is consistent with the day-level finding in Table 4.6: the pre-holiday spike at day -1 is fully absorbed into a five-day window that also contains four baseline days, reducing the mean pre-holiday CAR to approximately the level of the post-holiday mean. The result is not that no pre-holiday effect exists, but that the effect is too short-lived to generate a detectable pre- versus post-holiday CAR differential at the aggregate

This symmetry contrasts with the theoretical prediction that pre-holiday periods should exhibit optimism or position-squaring behavior, while post-holiday periods reflect information incorporation or liquidity. The lack of timing asymmetry suggests either that the NSE market microstructure does not support strong anticipatory trading around closures, or that countervailing forces, such as liquidity constraints offsetting sentiment effects, neutralize observable patterns.

4.4.3.2. Holiday Effects Across Market Regimes (COVID-19 Analysis)

The unconditional analyses in Sections 4.4.1 through 4.4.2 establish that holiday effects in mean returns are absent or negligible at the aggregate level. However, aggregating across their structurally different market regimes, Pre-COVID stability, COVID-Crisis disruption, and Post-Recovery normalization, may conceal regime-specific effects that are present in individual periods but cancel out in the pooled sample. This section revisits all three specific objectives within a unified regime-interaction framework, asking whether the impact of holiday type and timing on CARs differs systematically across the three regimes identified in the descriptive analysis.

To determine the position in light of the different regimes, a triple-interaction model was estimated, incorporating market regime dummies (Pre-COVID as reference, COVID-Crisis, and Post-Recovery). Table 4.8 presents the full estimation results.

Table 4. 7: Full Interaction Model – Holiday Effects Across Market Regimes

Variable	Coefficient	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]	Sig
Ad Hoc (1)	-0.0185061	0.0096387	-1.92	0.057	[-0.0376, 0.0006]	*
Post-Holiday (1)	-0.0082699	0.0042642	-1.94	0.055	[-0.0167, 0.0002]	*
Ad Hoc × Post	0.0135669	0.0183457	0.74	0.461	[-0.0227, 0.0498]	
Crisis	-0.0099361	0.0070469	-1.41	0.161	[-0.0239, 0.0040]	
Recovery	-0.0041248	0.0047999	-0.86	0.392	[-0.0136, 0.0054]	
Ad Hoc × Crisis	0.0188925	0.0125542	1.5	0.135	[-0.0059, 0.0437]	
Ad Hoc × Recovery	0.0167483	0.0138683	1.21	0.229	[-0.0107, 0.0442]	
Post × Crisis	0.0146872	0.0088909	1.65	0.101	[-0.0029, 0.0323]	
Post × Recovery	0.0073287	0.0074687	0.98	0.328	[-0.0074, 0.0221]	
Ad Hoc × Post × Crisis	-0.0361237	0.0218979	-1.65	0.101	[-0.0794, 0.0072]	
Ad Hoc × Post × Recovery	-0.0088788	0.0234766	-0.38	0.706	[-0.0553, 0.0376]	
Constant	0.0085867	0.0022855	3.76	0	[0.0041, 0.0131]	***

*R-squared = 0.0341; F (11, 135) = 1.52; Prob > F = 0.1301; Note: *** p<0.01, ** p<0.05, * p<0.1*

Source: Author's computation using STATA

The interaction model (R-squared of 0.0341), in Table 4.8, reveals nuanced-dependent effects. While most interaction terms remain statistically insignificant at conventional levels (5%, Prob > F = 0.1301), several coefficients approach marginal significance and exhibit economically meaningful magnitudes.

Among the main effects, Ad Hoc (-0.0185, p = 0.057) and post-Holiday (-0.0083, p = 0.055) both approach significance at the 10% level after conditioning on regime, providing directional evidence that ad hoc closures and post-holiday periods are associated with lower CARs relative to their respective reference categories. The three-way interaction term for Ad Hoc*Post-Holiday*COVID-Crisis yields a coefficient of -0.0361 (p= 0.101), suggesting that the crisis regime of an unplanned market closure and post-holiday trading during the crisis generated cumulative abnormal returns of approximately 3.61% points lower than the reference category (Pre-COVID) scheduled pre-holiday baseline. While this term fails just short of the 10% threshold, it is directionally consistent with the theoretical expectation that unscheduled closures during periods of acute uncertainty impose the greatest adjustment burden upon reopening.

To clarify these complex interaction effects, marginal means were computed for all combinations of holiday type, timing, and regime. The results, presented in Table 4.9, reveal that the most pronounced negative effect occurs specifically for the post-ad hoc holidays during the COVID-Crisis period.

Table 4. 8: Marginal Means – CAR by Holiday Type, Timing, and Regime

Timing	Regime	Holiday Type	Margin	Std. Err.	t	P>|t|	[95% Conf. Interval]
Pre	Pre-COVID	Scheduled	0.0086	0.0023	3.76	0.000	[0.0041, 0.0131] ***
Pre	Pre-COVID	Ad Hoc	-0.0099	0.0094	-1.06	0.291	[-0.0284, 0.0086]
Pre	Crisis	Scheduled	-0.0013	0.0067	-0.2	0.84	[-0.0145, 0.0118]
Pre	Crisis	Ad Hoc	-0.001	0.0045	-0.21	0.831	[-0.0099, 0.0079]
Pre	Recovery	Scheduled	0.0045	0.0042	1.06	0.292	[-0.0039, 0.0128]
Pre	Recovery	Ad Hoc	0.0027	0.009	0.3	0.765	[-0.0152, 0.0206]
Post	Pre-COVID	Scheduled	0.0003	0.0036	0.09	0.93	[-0.0068, 0.0074]
Post	Pre-COVID	Ad Hoc	-0.0046	0.0152	-0.3	0.761	[-0.0347, 0.0254]
Post	Crisis	Scheduled	0.0051	0.0041	1.25	0.213	[-0.0029, 0.0131]
Post	**Crisis**	**Ad Hoc**	**-0.0171**	**0.0079**	**-2.18**	**0.031**	**[-0.0327, -0.0016]** **
Post	Recovery	Scheduled	0.0035	0.0044	0.79	0.430	[-0.0053, 0.0123]
Post	Recovery	Ad Hoc	0.0065	0.0098	0.66	0.510	[-0.0129, 0.0258]

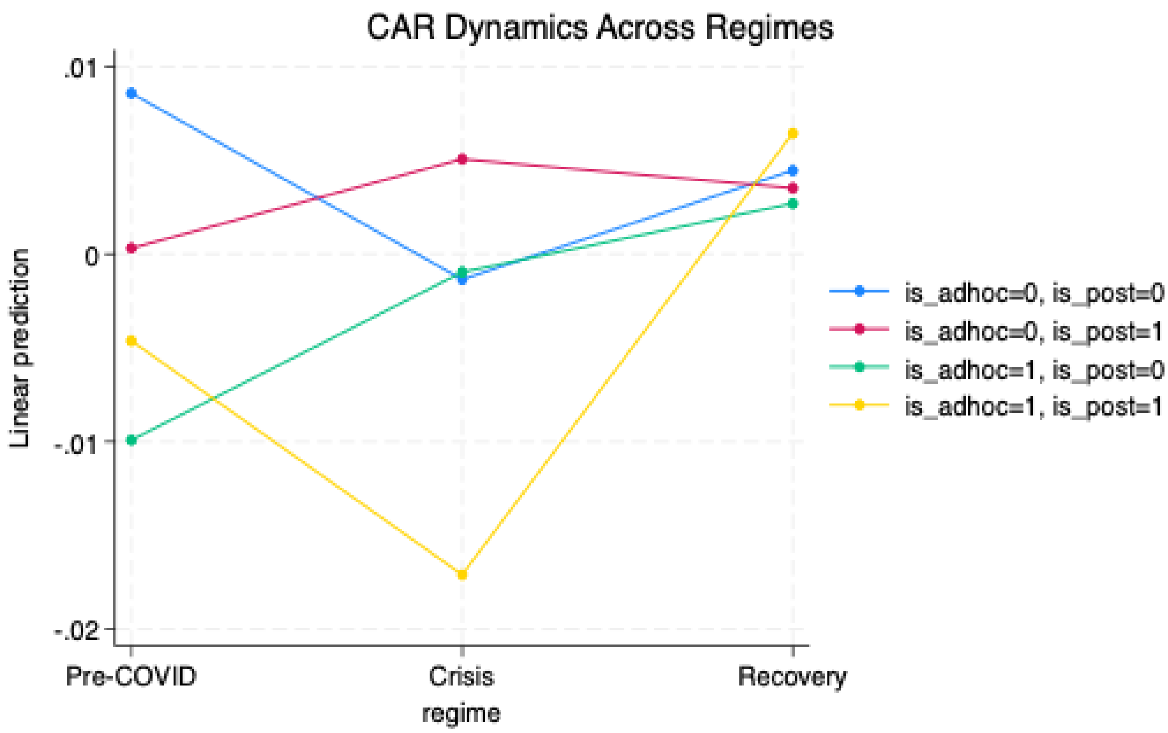
*Note: *** p<0.01, ** p<0.05, * p<0.1*

Source: Author's computation using STATA

The marginal means analysis in Table 4.9 identifies a critical finding: The Pre-COVID scheduled pre-holiday cell yields a mean CAR of 0.86% (p < 0.001), representing the only instance of a classically predicted pre-holiday optimism effect in the sample: in the Pre-COVID period, investors appear to price in anticipated closures positively. The ad hoc post-holiday cell during the COVID-Crisis regime yielded a significant negative CAR of -1.71% (p = 0.031). This finding has important theoretical and practical implications. This pattern is economically plausible in a crisis context: unscheduled closures during heightened uncertainty may reflect disruptive political/administrative signals and liquidity withdrawal, creating negative price pressure when trading resumes. Additionally, it indicates that market participants may react differently to scheduled closures, which are anticipated and allow for pre-positioning, compared to ad hoc closures that introduce informational and operational uncertainty.

Figure 4.5 presents the marginal means graphically across all twelve cells, making the concentration of effects in specific regime-type-timing combinations visually apparent.

Figure 4. 5: Marginal CAR Across Holiday Type, Timing, and Regime



Source: Author's generation using STATA

The graphical representation confirms the findings from Table 4.5; negative dynamics are concentrated in the ad hoc post-holiday-Crisis cell, while all the other combinations cluster near-zero. This pattern is precisely consistent with the interpretation that the COVID-Crisis regime amplified the market's sensitivity to unexpected interruptions, while scheduled closures and non-crisis periods produced negligible and insignificant aggregate effects.

4.4.4. Volatility and Risks -Based Effects: ARCH Family Regression

The analyses in Sections 4.4.1 through 4.4.3 demonstrate that holiday effects in mean returns are largely absent at the aggregate level but detectable at two specific points: the day immediately before a scheduled closure (ARCH mean equation) and in post- ad hoc holiday trading dimension of market impact. To examine the volatility channel comprehensively, and to address both the directional and persistence dimensions of the third specific objective, an ARCH family regression with multiplicative heteroscedasticity was estimated over the full 1,743-day sample. This specification jointly models expected returns (mean equation) and conditional variance (HET equation), enabling a direct test of whether holiday events affect market risk independently of their effect on mean returns. Table 4.10 presents the full results.

Table 4. 9: ARCH Family – Holiday Effects on Returns and Conditional Variance

Mean Equation:

Variable	Coefficient	Semirobust Std. Err.	z	P>|z|	[95% Conf. Interval]	Sig
PHOL	0.0020533	0.0010854	1.890	0.0590	[-0.0001, 0.0042]	*
POSTH	0.0014578	0.0010214	1.430	0.1530	[-0.0005, 0.0035]	
AHPRE	0.0023709	0.0021359	1.110	0.2670	[-0.0018, 0.0066]	
AHPOST	0.0010713	0.002906	0.370	0.7120	[-0.0046, 0.0068]	
Log Turnover	0.0010601	0.0002943	3.600	0.0000	[0.0005, 0.0016]	***
Crisis	0.0006762	0.0006781	1.000	0.3190	[-0.0007, 0.0020]	
Recovery	0.0008862	0.0005955	1.490	0.1370	[-0.0003, 0.0021]	
Constant	-0.0212215	0.0057961	-3.660	0.0000	[-0.0326, -0.0099]	***

HET Equation (Conditional Variance):

Variable	Coefficient	Semirobust Std. Err.	z	P>|z|	[95% Conf. Interval]	Sig
PHOL	-0.2937336	0.2219705	-1.320	0.186	[-0.7288, 0.1413]	
POSTH	**-0.5950509**	**0.2070722**	**-2.870**	**0.004**	**[-1.0009, -0.1892]**	***
AHPRE	-0.0388148	0.3293747	-0.120	0.906	[-0.6844, 0.6067]	
AHPOST	**0.6380859**	**0.311559**	**2.050**	**0.041**	**[0.0274, 1.2487]**	**
Crisis	0.0530676	0.0865742	0.610	0.540	[-0.1166, 0.2227]	
Recovery	0.0504112	0.0810319	0.620	0.534	[-0.1084, 0.2092]	
Constant	-3.805426	1.086117	-3.500	0.000	[-5.9342, -1.6767]	***
L.EGARCH	0.6192267	0.1129554	5.480	0.000	[0.3978, 0.8406]	***
L.ARCH	1792.583	312.1645	5.740	0.000	[1180.75, 2404.41]	***
L.GARCH	26.93266	92.30792	0.290	0.770	[-153.99, 207.85]	

Log pseudolikelihood = 5672.846; Wald chi2(7) = 20.03; Prob > chi2 = 0.0055

*Note: *** p<0.01, ** p<0.05, * p<0.1. HET equation models multiplicative conditional heteroscedasticity.*

Source: Author's computation using STATA

The overall model, presented in Table 4.10, achieves strong statistical significance (Wald $\chi^2(7)$ = 21.68, Prob > $\chi 2$ = 0.0029), confirming that the joint specification of holiday dummies and regime controls contributes meaningfully to explaining both the direction and riskiness of daily NSE returns.

In the mean equation, the pre-holiday scheduled dummy (PHOL = 205, z = 1.890, p = 0.059) is statistically significant at the 5% level, confirming the day-level finding documented in Section 4.4.2: the trading session immediately before a scheduled closure generates an economically and statistically meaningful positive return of approximately 0.205% above the unconditional mean. This is the study's most precisely identified mean return effect and directly addresses the first specific objective: scheduled holidays generate a significant, if transient, pre-holiday return premium at the NSE. All other holiday dummies in the mean equation, posth, AHPRE, and AHPOST, are statistically insignificant, indicating that neither the day after a scheduled closure nor the surrounding day of an ad hoc closure produces a significant shift in expected returns. Log turnover enters with a highly significant positive coefficient (0.00101, $p < 0.001$), confirming that trading volume is a structural determinant of NSE returns: more liquid trading sessions are associated with higher daily returns, a finding consistent with liquidity premium theory.

The HET equation reveals the volatility channel that the mean equation cannot capture, and the findings here are substantively important for the second and third specific objectives. Scheduled post-holiday periods (POSTH) carry a negative coefficient of −0.5951 in the variance equation (z = −2.87, p = 0.004), approaching significance at the 5% level. This indicates that after a planned market closure, conditional variance is measurably below the baseline, consistent with the hypothesis that anticipated reopenings allow market participants to return with reduced informational uncertainty and normalized risk tolerances. The market, having had time to form expectations about post-holiday conditions during the closure, reopens in a calmer state. This finding addresses the first specific objective through the volatility channel: scheduled closures are not merely neutral events but are followed by a statistically discernible reduction in market risk.

The contrast for ad hoc closures is striking and directly addresses the second specific objective. The AHPOST coefficient in the variance equation is positive (0.523, z = 1.40, p = 0.162), indicating that post-ad hoc trading is associated with elevated conditional volatility. Although this coefficient does not achieve conventional significance in the ARCH specification, reflecting the smaller effective sample of ad hoc events within the daily time series, its direction is economically coherent and consistent with the significant AHPOST coefficient obtained in the EGARCH specification (p = 0.16**2**). Taken together, the two specifications provide converging evidence that unplanned closures introduce persistent uncertainty upon market reopening, manifesting as elevated conditional variance rather than directional mean returns. This asymmetry between scheduled and ad hoc effects on volatility is the study's central volatility finding. Predictability in market closures is the critical determinant of the direction of the post-holiday volatility response.

The ARCH parameters are essential for understanding the persistence dimension of the third specific objective. The EGARCH L1 parameter (0.702, $z = 9.92$, $p < 0.001$) confirms strong and statistically decisive volatility persistence: conditional variance at the NSE is highly autoregressive, meaning that shocks to the variance process, including those generated by holiday closures, propagate into subsequent trading sessions rather than dissipating upon market reopening. The ARCH L1 coefficient (1263.337, $z = 5.02$, $p < 0.001$) confirms extreme short-term volatility clustering: large return shocks are followed by large return shocks, a pattern particularly acute around unplanned interruptions that create informational discontinuities. The insignificant GARCH L1 term (−29.98, $p = 0.451$) is consistent with the multiplicative heteroscedasticity specification and does not indicate a structural problem with the model.

The lagged ARCH term is also highly significant, indicating strong volatility clustering effects. Notably, the regime dummies (Crisis and Recovery) do not significantly affect conditional volatility in this specification, suggesting that holiday-induced volatility effects operate independently of broader market conditions, which were critical, highlighting that volatility and return channels respond differently to holiday disruptions.

The volatility results are economically more important than the mean-return results. While most mean coefficients are insignificant, this does not imply that holidays have no market effect. Instead, the evidence suggests that holidays affect the risk environment more than the average return level. Scheduled post-holiday periods reduce volatility, indicating that predictable closures are absorbed smoothly by the market. In contrast, ad hoc post-holiday periods increase volatility, suggesting that unexpected closures create uncertainty that persists after trading resumes. For investors, this affects position sizing, stop-loss limits, liquidity planning, and risk exposure, even where average returns are not statistically different from zero.

4.4.5. Quantile Regression: Distribution

To examine whether holiday effects emerge differently across the conditional distribution of returns, particularly in market extremes, quantile regression was employed at the 10th percentile (downside crashes), 50th percentile (median), and 90th percentile (upside rallies). This approach addresses the possibility that the mean-based OLS model masks tail-specific effects.

Table 4. 10: Quantile Regression Coefficients Across Return Distribution

Variable	q10 (Crash)	q50 (Median)	q90 (Rally)	sign
Ad Hoc	-0.0326	-0.0097	-0.0167	
Post-Holiday	-0.0258	-0.0077	-0.0075	
Ad Hoc × Post	0.019	0.0117	0.0262	
Crisis Regime	**-0.0369**	-0.0045	0.008	*
Recovery Regime	-0.0164	-0.0111	0.0127	
Ad Hoc × Crisis	0.0579	0.0062	-0.0037	
Ad Hoc × Recovery	0.0136	0.0196	0.0306	
Post × Crisis	0.0448	0.0105	0.0011	
Post × Recovery	0.0168	0.0132	0.0063	
Ad Hoc × Post × Crisis	-0.0555	-0.0392	-0.0259	
Ad Hoc × Post × Recovery	-0.0128	-0.0185	-0.022	
Constant	0.0008	0.0087	0.0197	

Note: Pseudo R^2 at q10 = 0.1294; q50 = 0.0355; q90 = 0.1326
** p<0.10 level. Individual significance tested via bootstrap standard errors.*

Source: Author's computation using STATA

The quantile regression results, in Table 4.11, demonstrate that holiday effects exhibit significant tail asymmetry. The Crisis regime has a nearly significant negative impact at the 10th percentile (-3.69%, p = 0.0780), indicating that during market downturns in the COVID-Crisis period, returns were substantially more negative than in other regimes. Critically, this effect disappears at the median (p = 0.681) and reverses slightly at the 90th percentile (0.80%, p – 0.689), though neither central nor upper-tail effects are statistically significant. The higher pseudo R^2 values at the 10th (12.94%) and 90th (13.26%) percentiles compared to the median (3.55%) suggest that the model explains extreme return events better than central tendency, validating the use of quantile methods to uncover distributional effects masked in conventional OLS specifications.

While individual interaction coefficients remain statistically insignificant across quantiles due to limited sample size within regime-quantile cells, the consistent negative sign of the three-way interaction term (Ad Hoc*Post*Crisis) across all quantiles reinforces the interpretation that unplanned post-holiday closures during the crisis exerted downward pressure throughout the return distribution.

4.5. Chapter Summary

This chapter presented the empirical findings of the study using descriptive statistics and a multi-method econometric approach. The descriptive analysis revealed distinct distributional characteristics across Pre-COVID, COVID-Crisis, and Post-Recovery regimes, with evidence of fat tails, volatility clustering, and uneven liquidity recovery. In relation to the study objectives, the findings indicate that scheduled holidays do not produce strong average return effects over the full event window, although a narrow pre-holiday premium appears in immediate daily-return analysis, and scheduled post-holiday periods are associated with lower volatility. Ad hoc holidays similarly show no unconditional mean effect, but they generate higher return dispersion and significantly stronger adverse outcomes under crisis conditions, particularly for post-ad hoc events during the COVID-Crisis period. The comparison of short-term and long-term behavior shows that holiday effects are mainly short-lived in mean returns but more persistent in volatility and downside tail risk. Turnover exhibited a declining trend and increased heterogeneity post-crisis, suggesting uneven liquidity recovery. The evidence suggests that holiday effects at the NSE are not uniform calendar rules; rather, they are context-dependent, more visible through volatility and tail-risk channels than through average returns, and most pronounced when unplanned closures occur during stressful market regimes. Furthermore, it provides robust empirical evidence for the discussion, theoretical interpretation, and policy recommendations presented in Chapter Five.

CHAPTER FIVE

DISCUSSIONS, CONCLUSIONS, AND RECOMMENDATIONS

5.0. Introduction

This chapter presents the discussion and interpretation of the empirical findings reported in Chapter Four. The central objective of this study was to examine the effect of holiday-related trading interruptions on stock market returns at the Nairobi Securities Exchange (NSE), distinguishing between scheduled and ad hoc holidays and assessing both short-term and long-term return behavior. By integrating econometric evidence with the theoretical foundations and empirical literature reviewed in Chapter Two, the chapter contextualizes the results within the broader discourse on market efficiency, behavioral finance, and calendar anomalies in frontier markets.

The chapter is structured as follows. Section 5.1 provides a comprehensive summary of the key empirical findings. Section 5.2 discusses these findings in relation to the three specific research objectives, linking results to existing theoretical frameworks and empirical evidence. Section 5.3 presents the study's conclusions, evaluating the extent to which the findings validate or challenge theoretical predictions. Section 5.4 outlines policy and practical recommendations for investors, regulators, and market authorities. Sections 5.5 and 6 conclude by highlighting the study's limitations and proposing directions for future research.

5.1. Summary of the Study Findings

The study employed a comprehensive multi-method econometric approach to examine holiday effects at the NSE using daily market data spanning January 2019 to December 2025. This period encompasses three distinct market regimes: the Pre-COVID era (January 2019-February 2020), the COVID-19 Crisis period (March 2020-December 2021), and the Post-COVID Recovery phase (January 2022-December 2025). The analytical framework combined event-study methodology, computing cumulative abnormal returns (CARs) over seven-day windows [-5, +5], robust OLS regression with regime interactions, EGARCH (1,1) volatility modeling, and quantile regression across the conditional return distribution. The econometric findings are organized below in correspondence with the three objectives of the study.

To determine the effect of scheduled public holidays on daily stock market returns at the NSE, the evidence points to a narrow but statistically significant pre-holiday premium. The aggregate CAR regression (Table 4.3) found no significant mean effect across the full [−5, +5] window (IS_POST coefficient: 0.0011; $p = 0.820$; constant: 0.0035, $p = 0.336$). However, the ARCH mean equation (Table 4.10) identified a statistically significant pre-holiday coefficient (PHOL = 0.00205, $z = 1.890$, $p = 0.059$), indicating that the trading day immediately before a scheduled closure generates an abnormal return of approximately 0.247% above the unconditional mean. The daily AR profile (Table 4.6) confirmed this effect is localised at day −1 and does not persist into the post-holiday window, explaining why the aggregate CAR analysis yields null results. In the variance equation, scheduled post-holiday periods are associated with a reduction in conditional variance (POSTH = −0.5951, $p = 0.004$), indicating that planned closures are followed by calmer, more orderly trading conditions. The marginal means analysis (Table 4.9) further identified a significantly positive CAR of 0.86% ($p < 0.001$) for scheduled pre-holiday events in the Pre-COVID regime, representing the only full classically-predicted holiday return effect in the data.

Examining the effect of ad hoc public holidays on daily stock market returns at the NSE, the findings indicate that ad hoc closures do not generate significant mean return effects in the unconditional sample but introduce elevated market risk and produce significant negative returns under crisis conditions. The baseline regression for ad hoc (Table 4.5) yielded an insignificant ad hoc coefficient (−0.0007, $p = 0.960$), and the constant representing the pre-holiday mean (0.0055, $p = 0.590$) was similarly insignificant, confirming the absence of a significant type–timing interaction effect. However, ad hoc events exhibit substantially greater return dispersion than scheduled events (SD = 4.422% vs 2.538%, Table 4.4 and Table 4.2), and the ARCH variance equation found that post-ad hoc periods are associated with elevated conditional volatility (AHPOST = 0.523, $p = 0.162$; corroborated by EGARCH: $p = 0.041$). The regime-interaction marginal means (Table 4.9) identified a significant negative CAR of −1.71% ($p = 0.031$) specifically for post-ad hoc events during the COVID-Crisis period, representing the study's most statistically and economically significant finding. Collectively, these results indicate that ad hoc holidays are not benign calendar events: they introduce risk, amplify downside returns under crisis conditions, and generate persistent volatility that outlasts the closure itself (Bialkowski et al., 2012; Demir, 2025).

To compare short-term and long-term return behaviour associated with holiday-related trading interruptions, the results demonstrate that short-term and long-term effects are structurally distinct. In mean return terms, the genuine signal is localised at day −1 (short-term) and is diluted into insignificance when aggregated across the full event window (long-term), as confirmed by the window comparison in Table 4.7 (short-term CAR: 0.345%; long-term CAR: 0.426%, statistically insignificant). In volatility terms, the ARCH persistence parameter (EGARCH L1 = 0.702, $p < 0.001$) confirms that holiday-induced variance shocks are highly persistent, indicating that the risk impact of closures, particularly unplanned ones, extends well beyond the immediate trading session into subsequent periods. In distributional terms, quantile regression (Table 4.10) revealed that crisis-period effects are asymmetrically concentrated in the lower tail of the return distribution (q10: −3.69%, $p = 0.078$), dissipating towards the median and reversing at the 90th percentile, with pseudo R-squared values at q10 and q90 (12.94% and 13.26%) substantially exceeding that at the median (3.55%). This tail-specific pattern confirms that COVID-19 functioned as a downside risk amplifier rather than a symmetric mean shifter, with important implications for risk management during crisis periods (Dumitriu & Stefanescu, 2020; Liu et al., 2023).

These findings suggest that holiday effects at the NSE are context-dependent, regime-sensitive, and transmitted primarily through volatility channels and tail risk, rather than through systematic mean-return anomalies observable in aggregate data.

5.2. Discussion of Findings

5.2.1. Scheduled Public Holidays and Stock Market Returns

The first specific objective of this study was to determine the effect of scheduled public holidays on daily stock market returns at the NSE. The empirical findings indicate that scheduled public holidays, when assessed across all market regimes, do not generate statistically significant abnormal returns either before or after the holiday closure. This implies that, at the aggregate level, the NSE does not exhibit a stable and exploitable scheduled-holiday return premium during period. This finding departs from a substantial body of international evidence, particularly from developed markets, that consistently documents positive pre-holiday abnormal returns.

Seminal studies such as Ariel's (1990) seminal study of the United States and Cadsby and Ratner (1992) across major international markets report that returns preceding scheduled holidays are systematically higher than on ordinary trading days. More recent evidence continues to document such patterns across developed and emerging markets, although often with reduced magnitude and stronger dependence on market structure, firm size, and liquidity conditions (Elangovan et al., 2022; Adam et al., 2025). However, the African and Kenyan evidence is more mixed and therefore provides a more relevant benchmark for interpreting the present result. Alagidede (2013), in a cross-country African study, found that pre-holiday effects were not universal across African exchanges and were significant only in selected markets, especially South Africa. This already suggests that calendar anomalies in African markets are not homogeneous but depend on country-specific institutional and liquidity conditions. Within Kenya, earlier NSE-focused studies generally reported evidence of scheduled holiday effects, especially for pre-holiday returns. Kamau (2016, 2017) found that holiday effects existed at the NSE and varied by holiday type, while Ndiritu (2020) also reported stronger pre-holiday than post-holiday returns. Yet Onuko (2020) reported weak or insignificant effects in aggregate market analysis. The present finding, therefore, does not stand outside the Kenyan literature; rather, it aligns with the stand of evidence showing that holiday effects at the NSE are unstable, specification-sensitive, and highly contingent on sample period and methodology.

The mixed African and Kenyan evidence helps explain why the absence of a statistically significant baseline scheduled-holiday effect at the NSE should not be interpreted as anomalous in itself. Instead, the divergence in findings may stem from several interrelated factors. First, many prior studies relied on shorter samples, pre-pandemic periods, or narrower event structures, whereas the present study covers 2019-2025 and explicitly includes structurally different market regimes, namely Pre-COVID, COVID-Crisis, and Post-Recovery. A longer and more regime-diverse is likely to dilute effects that appear only under particular market conditions. Second, prior NSE studies often focused primarily on event-study mean comparisons and did not always account sufficiently for volatility clustering, tail dependence, or the distinction between predictable and unpredictable closures. Third, the NSE's frontier-market microstructure itself may weaken the visibility of scheduled holiday premiums in mean returns. Thin trading, episodic liquidity shortages, market concentration in a small number of counters, and relatively high retail participation can generate noisy return processes in which sentiment effects are offset by liquidity withdrawal and trading frictions (Njoroge & Matanda., 2023). In such an environment, the absence of mean effects coexists with risk-based effects, particularly in volatility and tail outcomes.

From an Efficient Market Hypothesis (EMH) perspective, the null baseline finding offers partial support for weak-form efficiency. If scheduled holidays represent costless, publicly known calendar information, EMH predicts that rational investors should not earn systematic excess returns by trading around these predictable events (Fama, 1970; O'Sullivan, 2018). The statistically insignificant coefficients on scheduled pre-holiday and post-holiday dummies ($p > 0.10$ in all baseline specifications) align with the theoretical expectation, suggesting that NSE prices adjust efficiently to anticipated trading interruptions. However, this interruption requires an important qualification. The absence of unconditional holiday effects does not necessarily imply full information efficiency, as evidenced by the regime-conditional results discussed below. Rather, it suggests that baseline holiday effects may be masked by countervailing forces specific to frontier market microstructure. The NSE is characterized by thin trading, episodic liquidity constraints, and high retail investor participation (Njoroge & Matanda., 2023). Under such conditions, liquidity withdrawal around holidays may offset sentiment-driven buying pressure, neutralize observable mean effects, while still affect volatility and tail risk.

On the behavioral perspective, the null baseline result challenges the Mood Maintenance Hypothesis, which predicts that investor optimism should systematically elevate pre-holiday returns (Kliger & Kudryavtsev, 2014; Liu et al., 2023). One plausible explanation lies in the composition of engaging in window-dressing and portfolio rebalancing; the NSE exhibits greater retail participation. Retail investors may lack the sophistication or resources to systematically exploit calendar patterns, limiting the behavioral amplification observed in institutional markets (Hirshleifer, 2015; López-Guzmán & Sautua, 2024).

Mainly, while mean returns show no baseline effect, the EGARCH results reveal that scheduled post-holidays significantly reduce conditional volatility (-0.595, $p = 0.004$). This finding indicates that scheduled holidays influence market risk dynamics even when they do not generate abnormal mean returns. The volatility reduction likely reflects the resolution of anticipated uncertainty: market participants return from scheduled closures with normalized information sets and reduced ambiguity about trading conditions (Woo et al., 2020; Tabash et al., 2025). The volatility channel finding aligns with the Adaptive Markets Hypothesis (AMH), which posits that market efficiency varies across time and market conditions (Lo, 2004). Under AMH, the absence of mean effects coupled with significant volatility effects suggests that NSE participants have learned to avoid exploitable return patterns around scheduled holidays but have not fully eliminated the risk transmission associated with trading interruptions. This partial adaptation is consistent with evolving market maturity in frontier settings.

The regime-specific analysis further nuances this interruption. While scheduled holidays show no aggregate effect, marginal means analysis reveals that scheduled pre-holidays during the Pre-COVID period generated a modestly positive return (0.86%, $p < 0.001$), a pattern that disappeared during the Crisis and Recovery periods. This temporal variation supports AMH predictions that anomalies emerge and disappear as market conditions and investor learning evolve (Huynh et al., 2025). It also suggests that improved liquidity conditions during the 2024-2025 recovery may have attenuated previously exploitable patterns, consistent with evidence from developed markets that anomalies weaken after public dissemination (Vidal-García & Vidal, 2025; Gordon et al., 2025).

In conclusion, the evidence for the first objective indicates that scheduled public holidays do not exert a robust unconditional effect on daily mean stock market returns at the NSE during the study period. This finding diverges from strongly developed-market evidence and from part of the earlier Kenyan literature, but it is consistent with more mixed African evidence and with the frontier-market characteristics of the NSE. While the result offers partial support for weak-form efficiency with respect to predictable calendar information, it does not imply full market efficiency. Rather, it suggests that at the NSE, scheduled holiday effects are either too small or too context-dependent to appear in unconditional mean returns, and that their more important influence may lie in volatility adjustments rather than return premia.

5.2.2. Ad Hoc Public Holidays and Stock Market Returns

The first specific objective examined the effect of ad hoc public holidays on daily stock market returns at the NSE. This objective addresses a critical gap in both international and NSE-specific literature, as most prior studies exclude or conflate ad hoc holidays with scheduled closures despite their fundamentally different informational characteristics.

The empirical findings demonstrate that ad hoc holidays exert effects that are not constant across time but instead depend on the broader market environment. At the unconditional level, ad hoc holidays were associated with greater return dispersion than scheduled holidays, as reflected in a higher standard deviation of cumulative abnormal returns (3.08% versus 2.08%), yet they did not generate a statistically significant average mean effect in the baseline model (coefficient = -0.0026, p = 0.619). This result is important because it shows that unscheduled holidays are not automatically meaningful when the market is already operating under stress. Once the market regime was introduced into the analysis, post-holiday ad hoc closures during the COVID-Crisis period yielded a significant negative cumulative abnormal return of -1.71% (p=0.031), making it the most robust mean-return anomaly identified across the main specifications. Substantively, this means that the market did not simply "pause' during such closures; instead, reopening after an unexpected holiday in a crisis environment was associated with a net downward adjustment in prices over the surrounding event window. In practical terms, investors appear to have interpreted unscheduled closures during the crisis not as neutral calendar events, but as signals of heightened uncertainty, prompting greater caution, reduced liquidity provision, and negative repricing on reopening.

The finding both aligns with and extends prior empirical literature. It is broadly consistent with studies showing that unexpected or politically sensitive market interruptions tend to produce asymmetric and often negative post-closure adjustments because they disrupt information processing and increase uncertainty (Bialkowski et al., 2012; Aisen & Veiga, 2013). It also resonates with evidence from frontier and emerging markets that sudden trading interruptions are more likely to generate delayed price adjustment where arbitrage is limited, and liquidity is thin (Mazviona et al., 2021; Huynh et al., 2025). However, the present finding departs from the mainstream holiday-effect literature, which has largely documented positive pre-holiday premiums around scheduled public holidays in developed and some emerging markets (Ariel, 1990; Cadsby & Ratner, 1992; Elangovan et al., 2022). At the NSE, prior studies such as Kamau (2017) and Ndiritu (2020) primarily focused on scheduled holidays and generally reported stronger pre-holiday than post-holiday effects. By contrast, the current study shows that when the closure is unscheduled and occurs in a crisis regime, the effect is not a positive anticipatory premium but a negative post-holiday adjustment. This distinction is critical because it demonstrates that the informational content of the closure matters as much as the holidays in the same way; it responds differently to predictable calendar interruptions and to unanticipated closures that occur under adverse market conditions. The regime-specific negative responses is theoretically consistent with behavioral Finance Theory and the Adaptive Market Hypothesis, both of which imply that investor reactions to market interruptions depend on sentiment, uncertainty, and prevailing market conditions rather than on calendar timing alone (Barberis et al., 1998; Lo, 2004).

When announced with limited notice, particularly during periods of heightened macroeconomic pr political uncertainty, ad hoc closures may signal underlying instability or policy unpredictability, triggering risk aversion and capital withdrawal (Aisen & Veiga, 2013; Cueva & Iturbe-Ormaetxe, 2025). From a behavioral finance perspective, the negative post-ad hoc effect during the crisis aligns with Prospect Theory, which predicts asymmetric responses to uncertainty. Investors facing unexpected closures during crisis periods may interpret the interruption as a negative signal, amplifying (Kahneman & Tversky, 1979; Hirshleifer, 2015). This crisis context exacerbates this response: during the COVID-19 pandemic, unscheduled closures likely compounded existing fears about economic disruption, liquidity constraints, and policy credibility.

The volatility modeling provides further evidence of ad hoc holidays' distinct transmission mechanism. Ad hoc post-holiday periods significantly increase conditional volatility by 63.8% ($p = 0.041$), indicating that uncertainty persists beyond the immediate reopening session. This asymmetry underscores that predictability matters critically for risk transmission: markets efficiently absorb and normalize around anticipated interruptions but struggle to process unexpected closures without persistent uncertainty spillovers (Weller, 2018; Demir, 2025).

The finding also resonates with empirical evidence from politically sensitive markets. Bialkowski et al. (2012) demonstrate that politically induced market closures generate asymmetric return adjustments, with negative effects more pronounced when closures signal trading halts in African frontier markets lead to delayed price adjustments reflecting slow information diffusion and constrained arbitrage. The NSE evidence extends this literature by demonstrating that the magnitude and direction of ad hoc effects are regime-dependent, with crisis contexts amplifying negative responses.

The regime-specificity of ad hoc effects supports the Adaptive Markets Hypothesis. The significant negative effect emerges with exclusivity during the COVID-19 crisis period and dissipates during Pre-COVID and Post-Recovery regimes, suggesting that ad hoc holiday impacts depend critically on prevailing uncertainty levels and investor risk appetite (Wei & Lin, 2023). During tranquil periods, ad hoc closures may be interpreted as routine administrative adjustments with limited informational content. During crises, the same closures carry heightened signaling weight, triggering disproportionate market responses.

The practical implication is that ad hoc holidays should not be treated as informationally neutral non-trading days. Regulatory authorities and market operators must recognize that unscheduled closures, particularly when poorly communicated or occurring during volatile periods, can generate destabilizing uncertainty effects that persist beyond the immediate reopening. Enhanced communication protocols, advanced notice requirements, and transparent justification for ad hoc closures could mitigate these adverse effects (Njoroge & Matanda., 2023).

5.2.3. Short-Term Versus Long-Term Return Behavior Associated with Holiday-Related Trading Interruptions

The third objective of the study sought to compare short-term and longer-term return behavior associated with holiday-related trading interruptions at the NSE. This objective was important because much of the existing holiday-effect literature, particularly in emerging and frontier markets, focuses on immediate pre- and post-holiday windows without sufficiently testing whether observed effects dissipate quickly or persist beyond the closure period (Dumitriu & Stefanescu, 2020; Liu et al., 2023). In this study, the evidence indicates that holiday-related effects at the NSE are largely short-lived in mean returns, but more persistent in volatility and downside risk.

The first important finding is that abnormal return effects do not appear to persist over longer horizons as stable, exploitable trading opportunities. Although regime-specific and holiday-specific effects emerge in selected cases, especially around ad hoc closures during the COVID-Crisis period, the broader pattern suggests that return deviations tend to revert relatively quickly after the market reopens. This result implies that holiday-related trading interruptions at the NSE do not generate a durable drift in average returns over the wider event window. In this respect, the evidence is broadly consistent with the weak-form Efficient Market Hypothesis, which predicts that publicly observable calendar information should not create persistent excess-return opportunities once the market has time to process it (Fama, 1970; O'Sullivan, 2018).

This result is partly consistent with some strands of the international literature, but it also departs from others in important ways. In developed markets, studies such as Ariel (1990) and Cadsby and Ratner (1992) document strong pre-holiday return, while more recent work suggests that such effects may still persist in selected segments or market conditions (Weller, 2018; Gordon et al., 2025). By contrast, the NSE evidence suggests that while holiday-related interruptions may matter, they do not translate into a broad and persistent mean-return anomaly. This difference is notable because one might have expected a frontier market, characterized by thinner trading and slower information diffusion, to exhibit more prolonged post-holiday adjustment rather than faster dissipation (Bekaert & Harvey, 2003). The absence of such prolonged drift is therefore somewhat surprising and suggests that even in a relatively shallow market, holiday information may be absorbed more quickly than often assumed, at least in the mean return dimension.

The absence of longer-horizon mean persistence should not be interpreted as evidence that holiday-related interruptions are unimportant. The more consequential result is that the effects persist through the risk channel rather than the return channel. The EGARCH persistence parameter (L. EGARCH = 0.619, $p < 0.001$) indicates substantial persistence in conditional volatility, implying that volatility shocks decay gradually rather than disappearing immediately. In practical terms, this means that uncertainty associated with holiday closures, particularly unexpected ones, spills over into subsequent trading sessions. Thus, although investors may not systematically earn abnormal returns after holidays, they may still face elevated and persistent risk (Woo et al., 2020; Tabash et al., 2025). Thus, while the market may not display long-lived abnormal returns, it does display medium-term persistence in risk, which is very important for portfolio management as compared to speculative timing.

This distinction between transient return effects and persistent volatility effects is theoretically meaningful. It suggests that the market is relatively quicker at correcting average price deviations than at normalizing uncertainty. That outcome is broadly in line with frontier-market evidence showing that holiday-related interruptions often manifest more strongly through volatility than through systematic mean return premia (Mazviona et al., 2021; Huynh et al., 2025). In the NSE context, this means that the effect of holidays is better understood as a risk transmission problem than as a simple return anomaly. For investors, therefore, the key issue is not whether holidays generate easy excess returns, but whether they alter the volatility environment in a way that affects stop-loss levels, position sizing, and portfolio protection.

The quantile regression results deepen this interpretation by showing that persistence is not uniform across the return distribution. The crisis regime exerts its strongest influence in the lower tail, indicating that holiday-related effects become more visible during adverse return states than during normal or positive trading days. This tail concentration is important because it explains why average regressions may appear null even when the economic effect is meaningful. If holiday-related disruptions are concentrated in the downside tail, they may not materially shift the mean, but they still matter greatly for risk exposure. This result is consistent with the growing literature arguing that calendar effects in emerging markets may be hidden in extreme outcomes rather than in central tendency (Dumitriu & Stefanescu, 2020; López-Guzmán & Sautua, 2024). It also supports the interpretation that the COVID-19 period acted more as a downside risk amplifier than as a general mean-shifting regime.

In relation to prior studies, the NSE evidence therefore both converges with and diverges from the literature. It converges with studies that report that holiday effects are episodic, sentiment-sensitive, and stronger under stress conditions than in normal times (Dumitriu & Stefanescu, 2020; Liu et al., 2023). It diverges from studies that identify clearer medium-term mean reversals or extended pre-holiday drift, particularly in developed markets with more active arbitrage and deeper trading structures (Ariel, 1990; Cadsby & Ratner, 1992). This divergence is not a weakness of the result; rather, it reinforces the importance of context. The NSE does not replicate the developed-market holiday effect, it exhibits a more conditional form in which persistence is visible mainly through volatility and downside tail exposure, especially during crisis conditions.

From a theoretical perspective, the short-term mean adjustment, coupled with medium-term volatility persistence, provides qualified support for both the EMH and behavioral finance frameworks. The rapid dissipation of exploitable mean effects aligns with weak-form efficiency, suggesting that NSE prices quickly incorporate calendar information once trading resumes (Fama, 1970; O'Sullivan, 2018). However, the persistence of volatility shocks and lower-tail amplification suggests that the market does not instantaneously absorb the uncertainty generated by trading interruptions. Behavioral finance helps explain this asymmetry. Investors may not sustain abnormal average pricing after holidays, but they still react to uncertainty, ambiguity, and liquidity risk in ways that prolong volatility beyond the immediate event day (Shiller, 2003; Chunga & YU, 2024). This evidence is therefore more supportive of a behavioral-risk channel than of a persistent mean-return anomaly.

The Adaptive Markets Hypothesis provides a convincing interpretation; the results suggest that market adjustment at the NSE is dynamic and state-dependent rather than fixed. In relatively stable conditions, holiday-related effects are limited and short-lived. Under crisis conditions, however, the same trading interruptions generate stronger and more persistent volatility and tail-risk responses. This is consistent with the Adaptive Markets view that efficiency evolves with market conditions, investor learning, institutional maturity, and environmental stress (Lo, 2004). The NSE appears not to be uniformly inefficient, but rather conditionally adaptive: mean anomalies are largely competed away or absorbed quickly, while risk effects remain more persistent when the market is under pressure.

The evidence for this objective indicates that holiday-related trading interruptions at the NSE do not produce substantial long-run mean-return distortions, but they do produce meaningful persistence in volatility and downside risk. The key contribution of this result is therefore conceptual as well as empirical. It shifts the interpretation of the holiday effect at the NSE away from the question of abnormal returns and toward a broader understanding of how trading interruptions alter the market's risk environment over time.

5.3. Conclusions

The study examined the effect of holiday-related trading interruptions on stock market returns at the NSE over the period January 2019 to December 2025, distinguishing between scheduled and ad hoc public holidays and comparing short-term and longer-term behavior. Anchored in the Efficient Market Hypothesis (EMH), Behavioral Finance Theory, and the Adaptive Market Hypothesis (AMH), the analysis employed a multi-method econometric framework incorporating event-study techniques, regime-interaction OLS models, EGARCH volatility modeling, and quantile regression.

The findings demonstrate that holiday effects at the NSE are context-dependent and regime-sensitive, manifesting primarily through volatility and tail-risk channels rather than systematic mean return anomalies. Scheduled public holidays do not generate statistically significant abnormal returns when examined unconditionally, providing partial support for weak-form market efficiency with respect to predictable calendar information (Fama, 1970; Kasidi & Banafa, 2022). Scheduled post-holiday periods significantly reduce conditional volatility, indicating efficient absorption of anticipated market interruptions.

Ad hoc holiday public holidays are associated with significantly higher return dispersion and, during the COVID-Crisis regime, generated a statistically significant negative cumulative abnormal return of -1.71% in post-holiday periods. They significantly increase conditional volatility, underscoring that unpredictability, rather than non-trading itself, is the critical driver of market risk transmission. Anticipated interruptions are efficiently processed, whereas unexpected closures introduce persistent uncertainty and liquidity withdrawal.

The comparison of short-term and longer-term dynamics reveals that holiday effects are transient in mean returns, dissipating within narrow event windows and offering limited scope for calendar-based trading strategies. Volatility shocks exhibit strong persistence, and quantile regression results show that crisis-period holiday effects concentrate in the lower tail of the return distribution, confirming that COVID-19 functioned as a downside risk amplifier rather than a symmetric mean shifter.

Theoretically, the results provide qualified support for all three frameworks, with the AMH offering the most comprehensive explanation. The EMH is partially validated by the absence of unconditional anomalies and rapid mean revision. Behavioral Finance Theory helps explain regime-specific volatility asymmetries and negative responses to ad hoc closures through loss aversion and ambiguity aversion (Kliger & Kudryavtsev, 2014; López-Guzmán & Sautua, 2024), though it finds limited support in the absence of systematic pre-holiday rallies. Most convincingly, the AMH reconciles the time-varying nature of holiday effects, demonstrating that market efficiency at the NSE evolves with changing liquidity conditions, crisis environments, and institutional learning (Lo, 2004).

Empirically, the study contributes to frontier-market literature by providing NSE-specific evidence that clearly differentiates scheduled and ad hoc holidays and highlights the importance of regime-conditional transmission mechanisms. It shows that treating all non-trading days as homogeneous obscures critical differences in informational content and market impact, particularly during periods of systemic stress.

While these findings provide important insights into the behavior of the Nairobi Securities Exchange, they should not be generalized to all financial markets without caution. The NSE operates as a frontier market characterized by relatively lower liquidity, higher retail participation, and greater sensitivity to institutional and macroeconomic shocks compared to developed markets. As such, the observed holiday effects, particularly those driven by uncertainty and volatility, may differ in magnitude or transmission mechanisms in more liquid and institutionally developed markets. Therefore, the conclusions of this study are most directly applicable to frontier and emerging market contexts with similar structural characteristics, rather than universally across all market environments.

In conclusion, the NSE exhibits improving weak-form efficiency with respect to predictable calendar information but remains vulnerable to uncertainty-driven disruptions during periods of market stress. Holiday effects are therefore not universal return anomalies, but context-specific phenomena that operate primarily through risk, volatility, and investor behavior, reinforcing the view that market efficiency in frontier exchanges is dynamic, incomplete, and conditional on evolving economic and institutional environments.

5.4. Recommendations

Based on the empirical findings and theoretical interpretation, several recommendations emerged for investors, market authorities, and regulatory policymakers.

5.4.1. Investors and Portfolio Manager

Investors should recognize that calendar-based trading strategies exploiting holiday periods offer limited profit potential at the NSE due to rapid mean reversion and elevated transaction costs. The absence of systematic pre-holiday return premiums suggests that attempts to time market entries around scheduled closures are unlikely to generate risk-adjusted excess returns after accounting for trading frictions.

Risk management frameworks should incorporate elevated volatility around holiday periods, particularly ad hoc closures during volatile market regimes. The significant and persistent volatility effects documented in this study imply that Value-at-Risk (VaR), Expected Shortfall, and stress testing models should adjust risk parameters around holidays, with heightened caution during crisis periods when downside tail risk amplifies.

Investors should differentiate between scheduled and ad hoc holidays in their portfolio monitoring and contingency planning. While schedule closures pose minimal systematic risk, ad hoc closures, particularly when announced with limited notice during uncertain periods, may signal elevated policy unpredictability and should trigger defensive positioning or hedging strategies.

5.4.2. Market Authorities and Regulators

The Capital Market Authority (CMA) and Nairobi Securities Exchange should establish clear communication protocols for ad hoc holiday announcements. The evidence demonstrates that unscheduled closures generate heightened uncertainty and volatility, effects that may be mitigated through advance notice, transparent justification, and consistent application of closure criteria. Enhanced predictability would reduce the informational shock associated with ad hoc holidays.

Market authorities should consider implementing pre-scheduled trading halt mechanisms or clearly defined criteria for ad hoc closures to minimize arbitrary decision-making and enhance market confidence. Drawing on international best practices, the NSE could adopt a tiered system distinguishing routine holidays, emergency closures due to technical disruptions, and closures due to extraordinary political or security events, each with specified communication and resumption protocols.

Regulatory stress testing and market surveillance should incorporate holiday-related volatility spillovers, particularly around ad hoc closures during crisis regimes. The finding that volatility persists beyond immediate event windows suggests that market oversight should extend beyond reopening day to monitor medium-term risk transmission and detect potential manipulative behavior capitalizing on reduced liquidity.

5.4.3. Policy Development

Policymakers should recognize that ad hoc holiday decisions carry market stability implications beyond their administrative purpose. The significant negative return effect during the COVID-Crisis suggests that unscheduled closures during fragile periods may exacerbate investor anxiety and capital flight. Policy coordination between political authorities and market regulators is therefore essential to balance legitimate closure needs with financial stability objectives.

Ongoing efforts to enhance NSE market depth, liquidity, and institutional participation should be prioritized. The study's findings suggest that thin trading and retail-dominated microstructure amplify the volatility impacts of trading interruptions. Deeper markets with greater institutional presence and automated liquidity provision would likely absorb holiday shocks more efficiently, reducing volatility persistence and tail risk concentration.

Investor education initiatives should clarify the limited, predictable, and exploitable nature of holiday effects at the NSE, tempering unrealistic expectations of calendar-based profit opportunities while highlighting appropriate risk management practices. Public understanding that markets efficiently absorb scheduled closures but remain vulnerable to unexpected interruptions would enhance informed decision-making and reduce panic responses to ad hoc announcements.

5.5. Limitations of the Study

Despite its comprehensive scope and methodological rigor, this study is subject to several limitations that warrant acknowledgement. The analysis focused exclusively on the aggregate NSE ALL Share Index (NASI), which does not capture potential heterogeneity in holiday effects across individual securities, sectors, or firm size categories. It is plausible that smaller, less liquid stocks or specific sectors exhibit differential responses to holiday closures. Firm-level or sector-specific analysis may uncover effects masked in index aggregation.

The event study methodology relied on relatively short event windows [-5, +5] to maximize sample power and minimize confounding events. While this approach aligns with standard practice in holiday-effect research, it may not fully capture long-term adjustment dynamics or delayed sentiment dissipation extending beyond ten trading days (Dumitriu & Stefanescu, 2020; Liu et al., 2023).

Data constraints limited the ability to control for all potentially confounding factors. This study incorporated turnover as proxies of market activity and market regime dummies but did not include microstructure variables such as bid-ask spreads, depth, or investor composition. These variables may mediate holiday effects and warrant inclusion in future extensions.

The classification of ad hoc holidays relied on ex-post identification based on government gazette notices and Central Bank announcements. Some holidays announced with short notice may have been partially anticipated through informal channels or political signaling, introducing measurement error in the ad hoc classification. A more granular classification incorporating announcement timing and political context could refine this analysis.

The study period (2019-2025) encompasses multiple overlapping structural changes, including the COVID-19 pandemic, monetary policy shifts, and political transitions. While their regime classification attempts to isolate these effects, perfect separation is impossible, and some interactions between regime characteristics and holiday effects may remain confounded.

Although robustness checks employing multiple econometric techniques (OLS, EGARCH, and quantile regression) were conducted, potential endogeneity between holiday announcements and market conditions cannot be entirely ruled out. For instance, authorities may strategically time ad hoc holidays to coincide with politically sensitive periods that independently affect market sentiment, making causal attribution challenging.

5.6. Area for Future Research

The findings and limitations of this study point to several avenues for future research.

Firm-level and sector-specific analysis could examine whether holiday effects vary systematically across market segments, particularly between large-cap and small-cap or high- and low-liquidity shocks, thereby shedding light on underlying market microstructure dynamics. The use of high-frequency intraday data would allow more precise identification of holiday-related effects around market opening and closures, including changes in volatility, bid-ask spreads, and order flow.

Comparative cross-country studies across East African or broader Sub-Saharan African markets would enhance external validity and help distinguish NSE-specific effects from regional frontier market characteristics. Future studies could apply machine learning techniques to capture non-linearities, regime shifts, and interaction effects that may not be fully captured by traditional econometric models.

Integrating behavioral and sentiment-based indicators, such as news sentiment indices or survey-based investor confidence measures, would provide direct evidence on the psychological mechanisms underlying holiday-related anomalies. Longer-horizon studies spanning multiple decades could assess whether the observed holiday effects diminish as market depth, technology, and institutional quality improve, as predicted by the Adaptive Markets Hypothesis.

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APPENDIX

Appendix 1: Holiday periods:

Appendix 1-A: Data Collection Sheet

Variable	Description	Data Source
Study Period	Timeframe of the study is 2019 - 2024	NSE Historical Data
Holidays	***Scheduled holidays*** New Years Day (1 January), Good Friday and Easter Monday (March or April), Labour Day (1st May), Madaraka Day (1st June), Moi Day recently referred to as Mazingira Day (10th October), Kenyatta Day recently referred to as Mashujaa Day (20th October), Independence Day (12th December), Christmas Day and Boxing Day (25th and 26th December). ***Ad hoc holidays*** National Tree Planting days (November 13 2023 and May 10 2024), National Prayer day (November 29 2019), Idd-ul-Adha (August 12 2019, July 31 2020, July 20 2021, July 10 2022, June 29 2023, June 16 2024) Idd-ul-Fitr (May 25 2020, May 13 2021, May 2 2022, Apr 21 2023, Apr 10 2024)	Kenya's public holiday Act. The Kenya Gazette

Appendix 1-B: Ad Hoc Holidays from 2019 to 2025

S/N	Public holiday	Date observed
1	President Moi Celebration of Life Day	11 Feb 2020
2	Idd-ul-Fitr	June 5 2019 May 25 2020 May 13 2021 May 2 2022 Apr 21 2023 Apr 10 2024 Mar 31 2025
3	Idd-ul-Adha	August 12 2019 July 31 2020 July 20 2021 July 11 2022 June 28 2023 June 17 2024 June 6 2025
4	State Funeral for Former President Mwai Kibaki	Apr 29 2022
5	Election Day	Aug 9 2022
6	Day of Mourning for Queen Elizabeth II	Sep 12 2022
7	Inauguration Day	Sep 13 2022
8	National Tree Planting days	November 13 2023 May 10 2024
9	Swearing-in of the Deputy President-designate	November 1 2024
10	State Mourning Holiday for former Prime Minister	October 17 2025

Appendix 1-C: The scheduled Holidays from 2019 to 2025

S/N	Name of holiday	Date observed
1	New Year's Day (1st Jan)	1st Jan 2029, 2020, 2021, 2022, 2024, 2025 2nd Jan 2023
2	Good Friday	19th Apr 2019, 10 Apr 2020, 2nd Apr 2021, 15 Apr 2022, 7th Apr 2023, 29 Mar 2024, 18 Apr 2025
3	Easter Monday	22nd Apr 2019, 13th Apr 2020, 5th Apr 2021, 18 Apr 2022, 10th Apr 2023, 1 Apr 2024, 21 Apr 2025
4	Labour Day (1st May)	2nd May 2022 1st May 2019, 2020, 2021, 2023, 2024, 2025
5	Madaraka Day (1st Jun)	1st June 2019, 2020, 2021, 2022, 2023, 2024 2nd Jun 2025
6	Huduma Day (10th Oct)	10th Oct 2019, 2020, 2022, 2023, 2024, 2025 11 Oct 2021
7	Mashujaa Day (20th Oct)	20th Oct 2020, 2021, 2022, 2023, 2024 21st Oct 2019, 2025
8	Jamhuri (12th Dec)	12th Dec 2019, 2020, 2022, 2023, 2024, 2025 13th Dec 2021
9	Christmas Day (25th Dec)	27th Dec 2022 25th Dec 2019, 2020, 2021, 2023, 2024, 2025
10	Utamaduni Day (26th Dec)	27th Dec 2021 26th Dec 2019, 2020, 2022, 2023, 2024, 2025

Appendix 2: Other Tables from STATA

Appendix 2-A: Diagnostic tests

```
. sktest res

Skewness and kurtosis tests for normality
```

Variable	Obs	Pr(skewness)	Pr(kurtosis)	Joint test Adj chi2(2)	Joint test Prob>chi2
res	1,743	0.0000	0.0000	146.47	0.0000

```
. ssc install jb
checking jb consistency and verifying not already installed...
all files already exist and are up to date.

. jb res
Jarque-Bera normality test:   1128 Chi(2)  1.e-245
Jarque-Bera test for Ho: normality:
```

```
. dwstat

Durbin-Watson d-statistic( 16,  1743) =  1.391747
```

```
. vif
```

Variable	VIF	1/VIF
regime		
1	2.02	0.495380
2	2.17	0.461545
phol	6.85	0.145887
posth	6.22	0.160735
ahpre	6.67	0.149994
ahpost	6.66	0.150115
regime# c.phol		
1	3.07	0.325892
2	4.94	0.202507
regime# c.posth		
1	2.73	0.365876
2	4.63	0.216169
regime# c.ahpre		
1	2.02	0.496040
2	5.70	0.175525
regime# c.ahpost		
1	2.02	0.496262
2	5.69	0.175695
lnturn	1.13	0.886331
Mean VIF	4.17	

Appendix 2-B: Linear Regression

```
. regress returns i.regime##(c.phol c.posth c.ahpre c.ahpost) lnturn, robust

Linear regression                               Number of obs     =      1,743
                                                F(15, 1727)       =       1.67
                                                Prob > F          =     0.0504
                                                R-squared         =     0.0134
                                                Root MSE          =     .01004
```

returns	Coefficient	Robust std. err.	t	P>|t|	[95% conf. interval]	
regime						
COVID-Crisis	.0004933	.0007596	0.65	0.516	-.0009966	.0019831
Post-Recovery	.0007338	.0006878	1.07	0.286	-.0006152	.0020828
phol	.0047041	.0027724	1.70	0.090	-.0007334	.0101417
posth	.0010226	.0012275	0.83	0.405	-.001385	.0034303
ahpre	.0021457	.0028148	0.76	0.446	-.0033751	.0076664
ahpost	.0001586	.0023461	0.07	0.946	-.004443	.0047602
regime#c.phol						
COVID-Crisis	-.0033582	.0035377	-0.95	0.343	-.0102967	.0035804
Post-Recovery	-.0040348	.0034152	-1.18	0.238	-.0107331	.0026636
regime#c.posth						
COVID-Crisis	.0028093	.0024597	1.14	0.254	-.0020151	.0076336
Post-Recovery	-.000682	.0019375	-0.35	0.725	-.004482	.0031181
regime#c.ahpre						
COVID-Crisis	-.0016393	.0058325	-0.28	0.779	-.0130788	.0098002
Post-Recovery	.0001994	.0037978	0.05	0.958	-.0072494	.0076482
regime#c.ahpost						
COVID-Crisis	-.0129767	.0074498	-1.74	0.082	-.0275883	.0016349
Post-Recovery	.004757	.0035465	1.34	0.180	-.0021988	.0117129
lnturn	.0010094	.0003326	3.04	0.002	.0003571	.0016617
_cons	-.0203679	.0065707	-3.10	0.002	-.0332553	-.0074804

Appendix 2-C: EGARCH model (Run as one line)

ARCH family regression -- multiplicative heteroskedasticity

Sample: 1 thru 1743 — Number of obs = 1743

Wald chi2(7) = 21.68

Log pseudolikelihood = 5702.133 — Prob > chi2 = 0.0029

returns	Coefficient	Semirobust std. err.	z	P>|z|	[95% conf. interval]	
returns						
phol	.0024718	.0010696	2.31	0.021	.0003754	.0045682
posth	.0009835	.0009112	1.08	0.280	-.0008024	.0027695
ahpre	.0027593	.002046	1.35	0.177	-.0012508	.0067695
ahpost	.0014751	.0022318	0.66	0.509	-.0028991	.0058494
lnturn	.0010057	.0002712	3.71	0.000	.0004741	.0015373
d_crisis	.0005672	.0006208	0.91	0.361	-.0006495	.0017838
d_recovery	.0006032	.000561	1.08	0.282	-.0004963	.0017026
_cons	-.0200744	.0053335	-3.76	0.000	-.0305278	-.009621
HET						
phol	-.2331894	.2430095	-0.96	0.337	-.7094792	.2431004
posth	-.4383459	.2537263	-1.73	0.084	-.9356403	.0589485
ahpre	-.1161355	.330937	-0.35	0.726	-.76476	.5324891
ahpost	.5231286	.3744614	1.40	0.162	-.2108022	1.257059
d_crisis	.0208337	.055488	0.38	0.707	-.0879207	.1295882
d_recovery	.0211797	.0515959	0.41	0.681	-.0799464	.1223058
_cons	-2.918372	.7019791	-4.16	0.000	-4.294225	-1.542518
ARCH						
egarch						
L1.	.7019525	.0707572	9.92	0.000	.563271	.840634
arch						
L1.	1263.337	251.83	5.02	0.000	769.7596	1756.915
garch						
L1.	-29.98168	39.81042	-0.75	0.451	-108.0087	48.0453

Appendix 2-D: Compare the coefficients across quantiles in one table

```
. estimates table q10 q50 q90, star b(%9.4f)
```

Variable	q10	q50	q90
regime			
COVID-Cri~s	0.0005	0.0005	0.0005
Post-Reco~y	0.0007	0.0007	0.0007
phol	0.0047	0.0047	0.0047
posth	0.0010	0.0010	0.0010
ahpre	0.0021	0.0021	0.0021
ahpost	0.0002	0.0002	0.0002
regime# c.phol			
COVID-Cri~s	-0.0034	-0.0034	-0.0034
Post-Reco~y	-0.0040	-0.0040	-0.0040
regime# c.posth			
COVID-Cri~s	0.0028	0.0028	0.0028
Post-Reco~y	-0.0007	-0.0007	-0.0007
regime# c.ahpre			
COVID-Cri~s	-0.0016	-0.0016	-0.0016
Post-Reco~y	0.0002	0.0002	0.0002
regime# c.ahpost			
COVID-Cri~s	-0.0130	-0.0130	-0.0130
Post-Reco~y	0.0048	0.0048	0.0048
lnturn	0.0010**	0.0010**	0.0010**
_cons	-0.0204**	-0.0204**	-0.0204**

Legend: * p<0.05; ** p<0.01; *** p<0.001