Impact of Calendar Anomalies on Stock Price: A Study of KSE-100 Index

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Abstract

This research focuses on the month-of-the-year impact of calendar anomalies at the Pakistan Stock Exchange by using KSE-100 index data for the period running from January 2019 to August 2024. The objectives of this study are, first, to check for the existence of monthly anomalies in the stock market and their influence on stock returns; second, the way calendar anomalies affect financial experts and investors. By performing comprehensive statistical analysis, the research work has done descriptive statistics and Analysis of Variance, through which it identified important fluctuations in returns across different months. To be more precise, April, October, and November always gave positive returns; February and March were found to have a negative trend. In support of this, the results of ANOVA also showed that differences in returns across months are significant, hence establishing the month-of-the-year effect as a noteworthy phenomenon on the KSE-100 index. Practical implications of the findings are such that it suggests awareness of these anomalies can help in enhancing investment strategies by timing investments to receive optimal returns. It also adds to the academic literature in terms of empirical evidence that calendar anomalies exist in emerging markets like Pakistan, thus rejecting the efficient market hypothesis. However, it is confined to the KSE-100 index and a specific period. Hence, there exists a need for further research in different settings. Such an extension into more markets or longer periods should be considered in future research to contribute to a deeper understanding of calendar anomalies and their consequences for financial markets.

Keywords: Calendar Anomalies, Day of the week effect, Month of the week effect

Background of study

A stock exchange is an organized market for the trade of securities, and assets like commodities or currency stocks that are sold to companies that will buy them at a profit. This offers an orderly atmosphere for exchanging the securities of companies and often called "the market" that businesses use to gain capital from investors. More specifically, the stock market allows for securities transactions (selling and buying of owning a share in businesses) which provides companies with an environment that is regulated by laws to make their trade receptive only on dealing fairly when raising capital.

Regulatory Structure

Pakistan Stock Exchange is regulated by SECP which ensure the protection of investors' funds. The PSX complies with strict regulatory requirements as well as procedures to maintain openness and fairness in trading among partners.

Introduction to Calendar Anomalies

Definition of Calendar Anomalies

Seasonal effects, another name for calendar anomalies, are erratic stock return patterns that seem connected to the calendar. Hence also known as seasonal effects. The efficient market theory states that stock prices should represent all available information and not be influenced by predictable patterns, these anomalies imply that certain days, months, or periods offer different average returns than others.

Relevance to Financial Markets

Financial analysts and investors care about calendar anomalies because the binary nature of these patterns could affect trading strategies or investment decisions. Knowing these stock market anomalies helps develop better timing plans to buy/sell stocks, reducing risk and increasing revenue.

Importance of Understanding Market Anomalies

Market anomalies contradict the efficient market hypothesis, meaning these patterns create opportunities for certain investors to achieve extraordinary returns based on recurring tendencies in a given context or period. Understanding these irregularities can help investors:

Optimize Trading Models: Improving trading strategy around existing anomalies boosts investment performance.

Understand Risk Better: Knowing when returns are low or volatility is high helps manage risk exposure.

Calendar anomalies call into question the efficiency of markets (EMH), which holds that asset prices reflect all available information. This contributes to the ongoing debate on market efficiency by revealing that markets are not always efficient due to these anomalies.

Academic and Real-World Relevance

The study of calendar anomalies contributes to the growing body of knowledge on market dynamics and behavior. For industry practitioners, it has practical applications in trading and portfolio management.

Market Efficiency

Market efficiency is the primary mean through which the capital market allocates funds and economic research to productive sectors. These sectors can only do so when security traders are compensated on a fair basis in the market. The random-walk theory and the efficient-market hypothesis have a connection. As early as 1900, Bachelier was the first to contend that asset values may be a random walk pattern in finance. The random walk theory posits that a feasible reason for the distributed independent price compromises is because of the random walk theory. Stock prices represent all the available information, and as a result, a market is said to be efficient.

The market efficiency has been divided by Fama (1970) into the three following categories:

1. Weak Form of Efficiency: This is called Random Walk Theory as well. It tells about the information that existed in the historical sequence of price returns about the equal mean, and how this information is captured in the current stock prices.

2. Semi-Strong Form of Efficiency: According to this theory, current prices of stocks by the meandering are flat out on the publicly accessible information about the company as well as all previous prices that have been consistent with it.

3. Strong Form of Efficiency: This theory argues that any information, whether it is secret or known to the public, is also manifested in the microstructure of the market, and therefore the form of the market is efficient.

Problem Statement

In developed countries days of the week and months have a great effect on the stock return. Investors mostly behave as per the perception build about these effects. In case of Pakistan it is not studied that how days of the week and months of the weeks effects the stock prices of listed firms on KSE 100 index on Pakistan Stock Exchange.

Importance for Financial Analysts and Investors

Calendar anomalies are important for financial analysts and investors for several reasons:

Investment Techniques: Identifying days with expected gains helps develop trading tactics that increase earnings while reducing risk.

Market Timing: Understanding these anomalies allows investors to time their buys and sells more intelligently, taking advantage of systematic trends in stock return patterns.

Risk Management: Using data from these anomalies, financial analysts can improve their ability to measure market risks accurately and develop effective risk management and portfolio diversification strategies.

Behavioral Insights: Understanding anomalies reveals insights into the psychology of market participants, helping analysts grasp the factors leading to specific market behaviors.

Objectives of the Research

The following are the main objectives;

- To examine existence of monthly calendar anomalies in KSE100 index
- To investigate how monthly calendar anomalies impacts the Pakistan Stock Exchange.
- To examine how these abnormalities, affect financial experts and investors.

Research Questions

The study aims to respond to the following queries:

- Are the Pakistan Stock Exchange's monthly effect impacts noteworthy?
- What impact do these abnormalities have on stock returns?
- What effects do these anomalies have on market analysis and investing strategies?

Significance of the Research

This study is important because it adds to know-how about calendar irregularities in emerging markets such as PSX. It can help improve empirical evidence and practical understanding of market behavior for academic researchers and practitioners.

Literature Review

Abhijeet (2011) examined the impact of time-of-the-month and turn-of-the-month on returns on India's BSE Sensex stock exchange over a ten-year period from 1998-2007. The results showed significant influence of these factors on returns, with the first few days being more significant. However, there were notable differences in returns between different time periods within a month, indicating the presence of calendar effects.

Muhammad (2015) studied calendar irregularities on the Karachi Stock Exchange between 2008 and 2012 using the KSE 100 index. The study examined seasonal abnormalities on weekdays, weekends, and monthly basis. The results confirmed the existence of calendar inconsistencies at the KSE 100 index. Friday had the highest mean average return, supporting the weekend effect. March also showed the biggest positive return, indicating monthly irregularities.

Faisal, M. Shabri Abd. Majid's (2016) study reexamined three calendar anomalies of stock returns in the Indonesian stock market, using data from 2001-2014. The study found that the weekend and turn-of-month effects were present, with unusually high returns on the last trading days of the month and the first four days of the next month. These anomalies impact investor trading behavior and market efficiency, providing guidance for investors to choose the best time to invest and generate above-average profits.

Satish Kumar (2017) Calendar anomaly in India stock exchange. Researcher has analysed the stock returns under the influence of day effect, week effect and January effect. The study findings highlighted that on opening day (Monday) prices have a negative trend while on weekend (Friday) it has positive trend. Similarly, trading days in the month of January yield lower returns as compared to non-TOM trading days. These anomalies were larger in the 1980s and 1990s but have declined in recent times, which is an indication of increased market efficiency.

Fitim Deari and Yasmin Ulu (2023) has conducted study that examines the turn of month effect on the Macedonian Stock Exchange by using daily return data and OLS and pooled regression analysis. Results show that the effect is present for most individual stock returns and is stronger in the case of pooled results. This shows that the daily returns during the turn of the month effect period are significantly higher than during the rest of the month which shows more investment opportunities.

Christos Floros and Enrique (2014) has done study that investigates the calendar anomalies in the cash and stock index futures returns using data from FTSE100, FTSE/ASE-20, S&P500, and Nasdaq100 from 2004-2011. The study uses a Regime-Switching specification to differentiate between high and low volatile periods. Results indicates that seasonal patterns are not consistent because of basis risk and calendar does have the conditioning of market condition. The findings are recommended to financial risk managers who deal with futures markets.

Michael Gibbons and Hess (1981) have conducted study on Day of the Week Effects and Asset Returns, the expected returns on common stocks and treasury notes vary from day to day. The most notable example is the findings on Monday where the mean is very low or even negative.

Brounen and Hamo (2007) worked on several developed countries market and results also confirmed presence of calendar anomalies in these markets. Investigating a number of European real estate indices (securitized). Anwar and Mulyadi (2009) found that Indonesia and Malaysia experience positive abnormal returns on Fridays. However, Singapore did not exhibit

positive returns on Fridays. Additionally, none of the countries showed any Monday effect.

Santana et al. (2006) did not find any evidence of a day-of-week influence in their European market investigation. While their findings did point to short-term market inefficiencies, Ali and Akbar (2009) offered proof that there are no weekly or monthly impacts in the Pakistani equities market. Studies on the January effect are conflicting; some substantiate its existence while others do not.

Salman, Imran and Hunjra(2015) conducted research that investigates the impact of economic fundamentals, technical trading rules, and calendar events on equity market returns from 1992 to 2013. It found mixed results, with the Day of the Week effect appearing from 1992 to 1997 but becoming insignificant afterward, and the January effect not present. The study suggests investors and policy makers should consider these trends when developing strategies to benefit from market anomalies.

Alexandra and Gabriel (2024) conducted research that investigates the January effect, a market anomaly where security prices are distorted in January compared to other months, is studied using data from American stocks from the 1980s to 2023. The findings show that the January effect primarily affects small-cap stocks with high book-to-market values that do not pay dividends, primarily through regression analysis using dummy Ordinary Least Squares.

Shehadeh and Zheng (2023) carried out research with the help of the GJR-GARCH (1,1) methods to study the seasonality in stock market returns of seven countries in the Middle East. The research investigates calendar time anomalies such as day of the week, month of the year, turn of the month effect and half month effect. There is major evidence for these anomalies in all stock markets. The study makes a contribution to understanding calendar anomalies through out-of-sample testing as well as adding to the understanding of seasonal patterns in emerging stock market returns. The results are contrary to the efficient market hypothesis (EMH) and mean that calendar anomalies are still considered a major challenge to the EMH.

Anwar and Halari (2013), conducted study using both the Gregorian and Islamic calendars to investigate monthly calendar irregularities in the Pakistani stock market. It makes use of quantitative analysis of 106 firms' returns from 1995 to 2011 and qualitative interviews. Respondents saw trends in January and Ramadan, with lower volatility in the latter month because of investor mood. Quantitative results point to substantial monthly return variances and robust return volatility patterns, which may imply inefficiencies in the market. The study's conclusion, which provides guidance for investing

strategies, is that volatility exhibits monthly seasonality more so than mean returns.

Muhammad, Rossi and Khan (2017) this study examines the impact of the "Ramadan effect" on the Pakistani equities market's seasonal trends. The holy month of Ramadan influences the Karachi Stock Exchange (KSE) due to religious rituals and slower economic activity. Data from the KSE 100 index points from January 2001 to December 2010 is used to examine the effects of Ramadan on the market's performance.

Alex, Gupta, Sibande and Wohar (2019) conducted study examining the evolution of calendar anomalies in the US stock market from 1900 to 2018, using various statistical methods. Results show that the middle of the 20th century was the "golden age" of calendar anomalies, but all oddities vanished in the 1980s, supporting the Efficient Market Hypothesis. The study also uses trading simulation approaches.

Karim and Rasheed (2024), conducted study using artificial intelligence to analyze calendar anomalies in the Pakistan stock exchange. It uses Support Vector Machines (SVM), Decision Trees (DT), and Artificial Neural Networks to predict daily stock prices. The KSE100 index data from 1994 to 2023 is used as input and output. The study found that SVM outperforms DT and ANN in stock price prediction, indicating a weakly inefficient market and defying the efficient market theory.

Wuthisatian (2022) conducted study investigating calendar anomalies in the Thai stock market, focusing on January and DOW effects, a topic not extensively studied. It uses various composite indexes and data from 2014 to 2019, providing current insights into Thai stock returns trends. The Thai stock market exhibits daily seasonality and a recurring monthly pattern, with January showing higher returns than other months, and Monday showing lower returns than other trading days.

Guglielmo and Valentina (2017) made a research study aimed at investigating if calendar abnormalities, like January, day-of-the-week, and turn-of-the-month effects, characterize the Russian stock market. Using data on a daily basis from the MICEX market index, the study finds that when transaction costs, as measured by bid-ask spreads, are taken into account, there are no calendar anomalies and no suggestion of any profits that could possibly conflict with the efficiency of the market.

Darko, Dusan, Eugene and Stosic (2022),conducted research using multifractal analysis to investigate if calendar anomalies, such as day-of-the-week effects, affect market returns. It found that different days of the week have unique multifractal features, with Monday returns showing more persistent activity and richer multifractal structures. This habit persists during

financial crises, prompting further research on calendar anomalies for different market regimes.

Rashid and Kausar (2019), conducted research that investigates the Pakistan Stock Exchange's monthly calendar irregularity using aggregate and firm-level stock returns for the period from January 2000 to December 2017. The study divides sample companies into low-, medium-, and high-beta categories to examine the monthly stock return anomaly for companies with varying degrees of systematic risk. Results show a January impact on market and business stock returns, more pronounced in high-risk and low-risk companies. The December impact exists for risky enterprises, possibly due to year-end bonuses. The study suggests investors can achieve abnormal returns by predicting stock return patterns and creating investment strategies considering these factors.

Saeed (2018), conducted study focusing specifically on monthly anomalies in Pakistani energy sector companies. Monthly anomalies are used to assess changes in stock returns for 20 companies in the energy sector from January 1, 2001, to December 31, 2016. They discovered persisting evidence of monthly anomalies in Pakistan's energy industry by using the ARCH and GARCH models with dummies.

Farah, Barea and Kanwal (2022), conducted study examining the impact of three calendar anomalies on commodities traded on the Pakistan Mercantile Exchange (PMEX): gold, silver, natural gas, oil, and platinum. The research uses simple OLS regression and advanced models of Autoregressive Conditional Heteroscedasticity. Results show significant day-of-the-week anomalies in oil and silver, month-of-the-year anomalies in all commodities except oil, and significant turn-of-the-month effects in all top traded commodities.

Shahid and Sattar (2017), conducted study examining the Adaptive Market Hypothesis (AMH) using five calendar effects in the Pakistan stock market, examining daily returns of the KSE-100 index over 24 years. The research links Gregorian and Islamic calendar anomalies with the AMH, allowing for fluctuating performance over time. The study finds that all five calendar anomalies evolve, supporting the AMH. The study also reveals the presence of these anomalies in different market conditions, suggesting AMH better clarifies calendar effects behavior than Efficient Market Hypothesis.

Qureshi and Salman (2018), conducted study that examines the Day of the Week and January effect on stock returns, analyzing market efficiency theory and anomalies. Data from 1992-2013 shows varying effects, with the first impact from 1992-97 and the second from 2013-2013.The findings indicate that there is no January impact. Investors and policymakers should

consider these tendencies when formulating policies to influence market trends and profit from these anomalies.

Shahbaz, Nida and Ahmad (2021), conducted study that investigates if the Pakistani stock market experiences the "turn-of-the-month-effect (TOME)," a brief spike in registered share prices. The selection takes into account the secondary data, which consists of the "KSE-100 Index" ending prices for the years 2013 through 2018. Results show the TOME is significant only from 2013 to 2016 and disappears in 2017 and 2018. The study suggests that stock market crises may cause the anomaly to disappear.

Sattar and Shahid (2017), conducted study that examines the Adaptive Market Hypothesis (AMH) using five calendar effects in the Pakistan stock market, examining daily returns of the KSE-100 index over 24 years over the period from January 1992 to December 2015. The research links Gregorian and Islamic calendar anomalies with the AMH, allowing for fluctuating performance over time. The study finds that all five calendar anomalies evolve, supporting the AMH. The study also reveals the presence of these anomalies in different market conditions, suggesting AMH better clarifies calendar effects behavior than Efficient Market Hypothesis.

Khan, Nasir and Rossi (2017), conducted study that focuses on the daily KSE 100 index points from 2001 to 2010 to investigate the impact of Ramadan on the Pakistani equities market. The impacts of Ramadan are analyzed using OLS and GARCH models in this research. Results point to a slower pace of economic activity during Ramadan, with the stock market showing a little positive influence and less volatile behavior throughout the holy month.

Valija, Vaida and Egle (2021) conducted study that examines calendar irregularities in Baltic stock markets to test the Adaptive Market Hypothesis (AMH). It uses rolling windows and sub-sample GARCH regression with Kruskal-Wallis statistics. Three calendar anomalies—Friday, MoY (July and January), and ToM (turn-of-the-month)—were verified. The study found that during the 2007-9 financial crisis, anomalous returns on investing strategies were no longer possible.

Research Methodology

In this study methodology used to investigate the month of the year effect on the KSE-100 index using data from January 2019 to August 2024. The research utilizes secondary data obtained from the Pakistan Stock Exchange website. The statistical analyses performed include descriptive statistics and Analysis of Variance (ANOVA) using Microsoft Excel. The data for this study was collected from the Pakistan Stock Exchange website. The dataset comprises daily closing prices of the KSE-100 index from January 2019 to

August 2024. The data was organized in Excel for further analysis. Microsoft Excel was used for all calculations and analyses in this study. The Data Analysis Toolpak in Excel facilitated the computation of regression and ANOVA.

The following techniques were used to analyze the data:

The data set being used by this study is the daily closing values of KSE-100 index from 1st January 2019 to 6th August 2024

The daily stock returns are computed as follows

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

Where,

R_t= Daily returns of KSE-100 index

Ln= Natural log P_t = Index closing value at time 't'

P_{t-1}=Index closing value at time t-1**Month of the Year Effect Analysis**

The month of the year effect analysis was conducted to determine if there are significant differences in the returns of the KSE-100 index across different months.

Steps:

1. Calculate Monthly Returns: Monthly returns were calculated using the formula:

((The closing price of current month- closing price of previous month)/closing price of the previous month) × 100

2. Organize Returns by Month: The calculated returns were then grouped by month (January, February, etc.).

ANOVA (Analysis of Variance)

- Deviation of monthly return were calculated (by using MS Excel) to find the difference in return over months. To investigate the calendar anomalies at the Karachi stock exchange, in KSE 100 index the study intends to test the following hypothesis.

- Null Hypothesis (H0): There is no significant difference in the mean return in different months of the year.

- Alternative Hypothesis (H1): There is a significant difference in mean returns across different months of the year.

Data Analysis

A comprehensive analysis conducted for the calendar anomalies focusing on the month of the year effect on the KSE-100 index data from January 2019 to August 2024. The "month of the year effect" is a type of calendar anomaly in the stock market where returns vary depending on the month. The analysis contains three major subsections: Descriptive Statistics, Month-of-the-Year Effect Analysis, and ANOVA. These present the ideas of the trends in monthly returns, whether anomalies exist, and the significance of such trends.

Descriptive Statistics

The monthly returns for each year from 2019 to 2024 are summarized in the table below:

Table 1:   *Monthly Return for Each Year*

| MONTH	2019	2020	2021	2022	2023	2024
January	7.38%	2.20%	6.01%	1.75%	0.62%	-0.76%
February	-4.28%	-8.76%	-1.12%	-2.01%	-0.40%	4.19%
March	-1.04%	-23.04%	-2.78%	1.05%	-1.26%	3.76%
April	-4.83%	16.69%	-0.73%	0.71%	3.95%	6.12%
May	-2.20%	-0.53%	8.21%	-4.80%	-0.60%	6.72%
June	-5.76%	1.45%	-1.13%	-3.57%	0.30%	3.38%
July	-5.79%	14.05%	-0.64%	-3.35%	15.88%	-0.71%
August	-7.10%	4.72%	0.77%	5.48%	-6.31%	-0.89%
September	8.11%	-1.31%	-5.31%	-2.89%	2.73%	
October	6.62%	-1.68%	2.86%	0.33%	12.30%	
November	14.86%	2.96%	-2.41%	2.63%	16.59%	
December	3.68%	6.54%	-1.06%	-4.55%	3.17%	
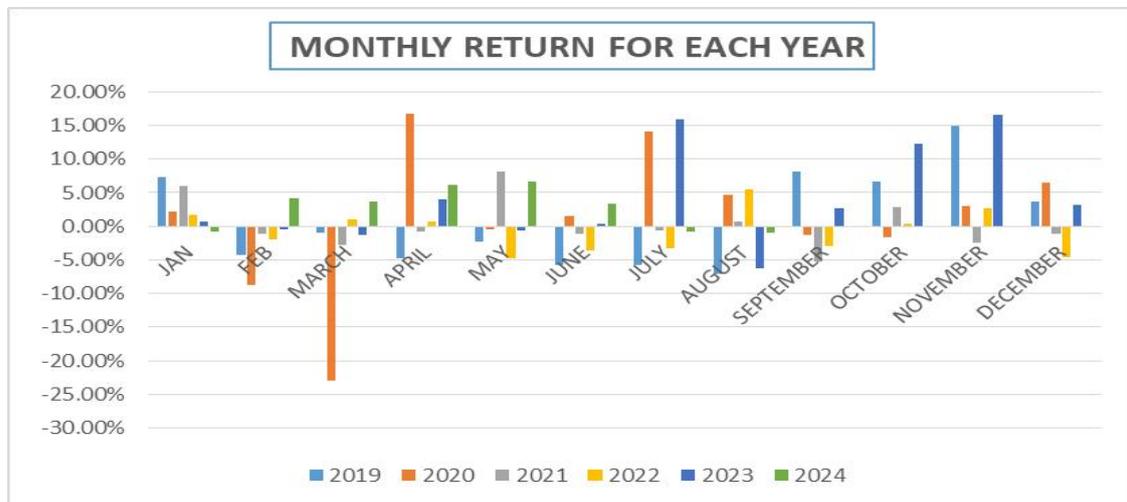
Figure 1:   Monthly Returns for Each Year

The monthly returns show significant variability across the years. Noticeable high returns include November 2019 with 14.86%, April 2020 with 16.69%, and July 2023 with 15.88%. Major negative returns include March 2020 with -23.04% and August 2023 with -6.31%.

Analysis of Calendar Anomalies

Month-of-the-year effect analysis

Here is the summary of average monthly return, standard deviation, variance, skewness, kurtosis, number of positive months, maximum return, and minimum return.

Table 2: *Month of the Year Effect*

MONTH	Mean	Std Dev	Variance	Skewness	Kurtosis	Positive months	Max return(%)	Min return(%)
Jan	1.97%	2.27%	0.05%	58.99%	-128.97%	4	7.38	-0.76
Feb	-2.06%	3.93%	0.15%	-22.93%	105.70%	1	4.19	-8.76
March	-3.89%	8.81%	0.78%	-214.08%	493.51%	2	3.76	-23.04
April	3.65%	6.78%	0.46%	110.77%	169.50%	4	**16.69**	-4.83
May	1.13%	4.71%	0.22%	59.49%	-146.71%	2	8.21	-4.80
June	-0.89%	3.06%	0.09%	-34.06%	-79.72%	3	3.38	-5.76
July	3.24%	8.49%	0.72%	79.85%	-173.68%	**2**	**15.88**	-5.79

Aug	-0.55%	4.87%	0.24%	-20.20%	-188.51%	3	5.48	-7.10
Sept	0.27%	4.72%	0.22%	82.06%	-7.65%	2	8.11	-5.31
Octo	4.09%	4.96%	0.25%	79.25%	-17.10%	4	12.3	-1.68
Nove	6.93%	7.45%	0.56%	32.17%	-258.90%	4	**16.59**	-2.41
Dece	1.56%	3.90%	0.19%	-54.38%	-80.66%	3	6.54	-4.55

Figure 2:   Average Monthly Returns

Monthly Return Patterns

January: Exhibits a moderate positive average return of 1.97% with relatively low variability. The skewness and kurtosis values suggest a moderate deviation from normality.

February: Shows a negative average return of -2.06%, indicating a generally poor performance in this month.

March: The most negative average return (-3.89%) and highest standard deviation (8.81%) among all months, indicating high volatility.

April and October: Both months exhibit strong positive average returns of 3.65% and 4.09%, respectively, with relatively higher positive skewness.

November: Shows the highest average return (6.93%) and significant variability, indicating potential for high gains.

July and December: Both months have positive average returns, but with varying levels of standard deviation and skewness.

Conclusion

The analysis reveals significant variations in mean returns across different months. April, October, and November show positive mean returns above 3%, while February and March exhibit negative mean returns. The values of kurtosis and skewness reflect that there is a significant deviation from the normal distribution in quite a few months, particularly during March and November.

Table 3: *ANOVA: Analysis of Variance*

Groups	Count	Sum	Average	Variance
Mean return	12	0.1543539	0.01286283	0.000879549
Std deviation	12	0.6393971	0.0532831	0.000439748

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	0.00980279	1	0.00980279	14.86061944	0.000859	4.3009495
Within Groups	0.01451227	22	0.00065965			
Total	0.02431506	23				

- **F-value**: The calculated F-value of 14.861 is significantly higher than the critical value of 4.301. The result therefore is that there exist significant differences in returns across months, suggesting that there may be a month-of-the-year effect in that some months may have a different average return than others.
- **P-value**: Since this is less than 0.05, I can reject the null hypothesis that all monthly returns are equal, suggesting a month of the year effect in the KSE-100 index.

Discussin

This study attempts to interpret the findings in the context of the month-of-the-year effect on the KSE-100 index from January 2019 to August 2024. This will be done through a proper explanation of the results in the light of research questions and objectives, relating it to their implications for investors and market participants, and highlighting theoretical contributions. Moreover, it will point out the limitations of the study and give recommendations related to future research in calendar anomalies.

Interpretation of Findings

The research tested the presence of a month-of-the-year effect in the KSE-100 index and found it prevalent with certain months indicating significant anomalies.

Objective 1: Existence of Monthly Calendar Anomalies

The analysis proved that there were considerable monthly anomalies to the KSE-100 index, whereby a few months usually ended up with either higher or lower returns. It is of huge importance to note that in most cases, April,

October, and November did yield positive returns, while February and March showed negative returns. This thus goes in line with the research question concerning the impact of monthly effects on stock returns, an aspect which manifests as significant.

Objective 2: Impact on the Pakistan Stock Exchange

Results suggest that the month-of-the-year effect is one phenomenon contributing to the predictability of the Pakistan Stock Exchange. It would be expected to impact trading volumes, investor behavior, and the general trend in financial markets since some months of the year will be considered auspicious or otherwise as favorable times for investment.

Objective 3: Impact on Financial Experts and Investors

These anomalies are therefore of core interest to financial experts and investors in framing appropriate trading strategies. The study here thereby points out that ignoring these calendar effects may mean missing out on opportunities or even facing unexpected losses in those months when returns have turned out to be negative.

Implications for Investors

Practical implications for investors and market participants

For the investors, it offers an opportunity to adapt their strategies for the month-of-the-year effect. It allows the optimization of the investors' portfolio management to be overexposed, preferably in certain historical months, such as April and November, which have yielded a positive return. Meanwhile, the return of February and March has been negative, hence prescribing a careful attitude toward these months. These insights would help the investors time their investments in relation to the expectations for realizing higher returns, and improve the performance of their portfolios for investment.

Academic Significance

This study adds to the body of existing literature by its empirical evidence on the month of the year effect of Pakistan stock exchange. This research serves as a supporting document for the theory that calendar anomalies are not just a phenomenon of developed markets, rather they exist in the developing markets as well like in the case of Pakistan. It adds to the better knowledge about the efficiency of the markets and predictability of stock returns, thus debunking the efficient market hypothesis, which states that all information has already been priced.

Limitations of the Study

The limitations are as follows:

- This study only focused on the KSE-100 index, so the findings cannot be generalized to any other indices or markets.

- This was based on a period from January 2019 to August 2024, which is a short time and may not capture the trend of the long-term evolution. It would not explain any structural change in the market.
- The study did not take into consideration exogenous factors that could influence the observed anomalies. These factors may include macroeconomic conditions, political events, or global market influence.

Recommendations for Future Research

Future research in this area of calendar anomalies may extend the current study by:

- Extending the time period to measure whether the month-of-the-year effect persists over time.
- This could also involve checking other calendar anomalies, such as the day-of-the-week effect or holiday effects, in order to give an explanation of market behavior covering all different aspects.
- How the observed anomalies might have been affected by macroeconomic variables and global market conditions?
- Comparative analysis with other emerging markets to find out whether such patterns are replicated across different geographic regions.

5.7 Conclusion

This chapter has interpreted key findings of the study concerning the objectives and questions of the research. It brings out the existence of significant monthly anomalies in the KSE-100 index. The practical implications for investors has been discussed, together with theoretical contributions made to the academic literature, limitations of the study, and recommendations put forth for future research on calendar anomalies. It therefore follows that calendar effects are important to consider in any current and future academic research or practical investment strategy.

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