

# Seasonal Anomalies and Firms Financial Distress; Evidence from Nairobi Securities Exchange, Kenya

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**Abstract** Stock market generally accepted as security exchange has immensely attracted so much interests from various stakeholders around the world as they endow exceedingly to the growth of the world economy. Kenya's stock market, Nairobi Securities Exchange, being an emerging market, this study focused on seasonal anomalies as a type of market anomalies which is operationalized monthly. When there is seasonal anomalies, firms tend to exhibit unhealthy financial position which is financial distress. Financial distress takes a huge chunk of challenges which firms face in their day to day operations and is measured by Z-Score. This study takes a departure from the previous studies and assesses listed firms which are trading, under suspension or delisted from the stock markets while at the same time relating seasonal anomalies to financial distress which created a scholarly gap. This study adopts descriptive research design. It also embraced secondary data from 2007 to 2017 from a target population of 67 listed firms which had been licensed by the Capital Market Authority. It was found that there was indeed a relationship between seasonal anomalies and firms' financial distress. The study recommends that the management must have well thought risk mitigants so as to avoid the harsh repercussions of the seasonal anomalies effects. Investors ought to engage finance experts on investment decisions so as to only invest in financially healthy firms. Policy makers and regulators should have the capability and capacity of unearthing the infamous practice of tax evasion or tax fraud by firms. They should also make sure that information dissemination is done in accordance and within the precincts of the law so as to benefit of all the stakeholders.

**Keywords:** securities exchange, financial distress, seasonal anomalies

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## 1. Introduction

Securities are tradeable financial assets which are grouped into equity securities (stocks), debt securities (bonds) and derivative securities. Securities can be traded on an exchange or over the counter. Security exchange is a place whether physical or electronic where securities in listed firms are bought and sold, [1]. This study focused on equity securities which are also known as stocks. Stocks are categorized as a security that represents ownership interest in a firm.

Stock market has immensely attracted so much interests from various stakeholders around the world as they endow exceedingly to the growth of the world economy. Stock trading therefore permits firms to raise capital to settle debt, launch contemporary products and enlarge if not diversify its operations. For investors, stocks give the opportunity to profit from yields in stock value in addition to company dividend payments. As an economic institution, stock market performs an important responsibility

in the economy which improves the effectiveness in capital origination and allotment, [2].

Anomalies are referred to as when the opportunities of trading arise from the strategies by which trading in stock give birth to above-normal returns, [3]. According to [4], financial anomaly refers to a price pattern conduct that is not in conformity with the traditional forecasts of markets efficiency, logical expectations pricing theory. Market anomalies are considered to be cross-sectional and time series designs in assets or stocks yields which are unpredictable by a principal view. There are different types of market anomalies such as fundamental, technical, seasonal and size effect anomalies. Kenya's stock market, Nairobi Securities Exchange being an emerging market, this study thus focused on seasonal anomalies.

Seasonal anomalies, commonly known as calendar anomalies came into existence simply because there was departure from how stocks behaved normally with respect to time periods. It can also be said to be the market anomalies that have a relationship with specific time period. This can be seen in the changes of stock prices from day to day, month to month and year to year. Such

price changes are categorized into turn-of-year, turn-of-week effect, weekend effect, Monday effect and January effect, [5]. Watchel became the first researcher to report on seasonal anomalies in stock earnings, [6]. When price of certain stock does not follow what is expected in the period being taken into consideration, gives a totally different price against the norm, then this is seasonal anomaly. This influences performance of firms and hence financial distress.

Stock returns display some regular forms during particular moments of the day, week or month, [7]. At times some days in a week give lower earnings in comparison to other days and this is regarded as days of the week effect, [8]. Monthly patterns is also one of the most common patterns and this is when particular months give more returns as compared to the rest of the months and this is referred to as the month of the year effect. The presence of seasonality in stock markets violates a very vital theory in the realm of finance that is Efficient Market Hypothesis (EMH), which forms an integral paradigm in the field. The EMH correlates with how expeditiously and precisely the market responds to new information, [9].

Calendar anomaly which is also considered as time anomaly goes against the weak form of efficiency. This is so as the weak form efficiency hypothesizes that the stock markets are efficient. Then, this acknowledges that the past prices cannot influence and predict the future prices of the stocks. The existence of seasonality and monthly effects does not support the market efficiency hypothesis which make the investors earn an abnormal return, [10].

The scope of seasonal anomaly is a well-recognized section in the field of weak-form EMH researches. Tax preference theory also fits in well in seasonal anomalies. Seasonal anomalies may be measured daily, monthly or annually. This can be seen in, some seasonal returns that are consistently recurring patterns of stock series which appear per week, per month or annually, [5]. Thus, seasonal anomalies can come up from seasonal returns. In this study due to the nature of the stock market, seasonal anomalies will be operationalized by the frequencies of occurrences on a monthly basis, [5].

The assumption that a certain security will perform well during a particular season brings in financial distress as the expectation is not met, [11]. Seasonal anomalies rebut the weak form efficiency as the later posits that markets are efficient in previous prices and it's impossible to foretell future prices grounded on these foundations. However it is interesting to know that the seasonality effects existence rebut market efficiency theory where investors earn abnormal returns, [10]. The main causes of seasonal anomalies are differences on how taxes are handled, adjustments of cash flow, unspontaneous adjustment to new information, different tax treatments and behavioral limitations of investors.

[12], describe firms in financial distress status as firms that are inefficient producers, have lost the value of the market and possibly are experiencing high fiscal leverage and cash flow difficulties. [13], state that features of distressed firms are; made losses recently, high leverage, low level of cash holdings, volatile and low stock returns. It's puzzling to note that investors have inclination towards returns which are positive and holds onto stocks which are distressed in spite of low returns, [14].

Financial distress affects the survival of firms listed in the stock market as these firms face restructures, being put under receivership, suspension or possibly delisted from the stock markets. Globally all stakeholders are mostly concerned with the financial health of listed firms in the stock markets, [15]. This has then rendered the stock market as a tool which is very effective for economy development of any nation, [2].

Therefore, it is evident that when there is seasonal anomaly, then firms tend to exhibit financial distress. Thus seasonal anomaly and financial distress have a relationship. Finding out the link which exists in this relationship will be a sigh of relieve to all the stakeholders, [16]. According to [17], it was discovered that companies with high credit risk Z-Score reach a minimum downgrade to capture financial distress.

### 1.1. Statement of the Problem

Financial distress takes a lion's share of challenges which firms listed in the Nairobi Securities Exchange are exposed to in their day to day operations. According to [18], the effects of financial distress are so severe to the operations of a firm and its environment which consists of stockholders, credit institutions, investors, management, employees and a whole economy. In Kenya, about 53% of the firms listed in the Nairobi Securities Exchange are financially distressed, [19]. Kenya has seen 21 listed firms which undertook financial restructure, put under receivership, suspended or delisted from the Nairobi Securities Exchange due to financial distress since independence [20]. This study attempts to ascertain if the fundamental anomalies have a significant relationship with financial distress, [21].

### 1.2. Objectives of the Research

The main objective of this study is to examine the relationship between seasonal anomalies and firms' financial distress; evidence from Nairobi Securities Exchange, Kenya.

### 1.3. Research Hypothesis Testing

$H_0$ : Seasonal anomalies have no significant relationship with the firms' financial distress; evidence from Nairobi Securities Exchange, Kenya.

## 2. Literature Review

The January effect was registered by Rozeff and Kinney in 1976 in New York Securities Exchange (NYSE) in the period between 1904 and 1974, [22]. In their study, it emerged that average earnings were higher for the month of January than other months under consideration signifying a pattern in stock returns. As a researcher, Keim also studied seasonality along with size effects in stock returns, [23]. The outcomes of his study was that the earnings of small firms were significantly higher than those of large firms in the month of January. He associated his conclusion to the tax-loss-selling and information assumptions. Surprisingly, [24] was with a

different opinion that the presence of seasonality in the earnings of the stock may not be fully described by tax-loss-selling proposition only.

In the study of seasonality of the Australian stock market, there was a proof of the December-January and July-August seasonal effects, with the latter due to a June-July tax year, [25]. In a rejoinder, Raj and Thurston in their study came up with a conclusion that the January and April effects in the New Zealand stock market were not statistically significant, [26]. In a study of calendar effect, for a period between 1986 and 1992, Mill and Coutts, found out that indeed there was the presence of the calendar effect, [27]. There was no trace of seasonal effect in the stock returns of the Jamaican stock market, [28]. There was the January effect on the UK and the US stock returns but none was documented in the German stock market, [29].

According to [30], seasonal patterns in earnings were noted in 18 stock markets. Logically, January effect in most of the developed nations like U.S and U.K are assigned to the tax-loss-selling theory, settlement processes and insider trading information. Window dressing is another effect that is associated with organizational trading. In order not to incur losses in the firm's portfolio selection associated by the end of the year, firms need to dispose-off their losers in December. After which these stocks are bought after reporting date in January as this will make them hold onto their intended portfolio form once more.

Half-month effect has also been recorded by various researches in literature. To this effect, during the first half of month, daily stock returns have been documented to be higher than last half of the month. This has been manifested in the research of [31] who carried out a research using United States stock market indices between 1963 and 1981. According to [32], such effects are reflected in various global markets. During the first and the last four days of the month, stock market earnings were continually higher, [33].

Turn-of-the-year effect is another form of seasonal anomaly. According to [34], this anomaly exhibits how the increase in the stock prices and volume of trading in the stock market happens in the last week of December and the first half month of January. In the study conducted by [23] and [24] exposed that considerable amount of the abnormal profits to firms that are small are quantified relative to the Capital Asset Pricing Model (CAPM) more often than not this comes into play during the first two weeks of the month of January. This anomaly is favoured to be referred to as the "turn-of-the-year effect". The January effect is the situation in which the stocks of small firms have the ability to produce more returns than the stocks of big firms in the market and this takes place in the first two to three weeks of January. Due to high liquidity in the month of January, January effect bounces in action, [35].

According to [11], the propensity of increase of stock prices in the last two and the first three days of every month is called turn-of-the-month effect. This means that the stocks prices have a possibility of increasing in the last trading day and the first three days of the following month, [34]. When investors buy stocks on days when the prices are abnormally low and sells them on days when the

prices are abnormally high, this is referred to as the day-of-the-week effect, [36].

When the stock market performs better on any day that precedes a holiday, then this is known as the holiday effect. This shows that there are better returns in trading days close to holidays, mostly in the pre-holiday periods. Higher returns were recorded during the preholiday trading days in every year in the U.S stock market, [37,38,39]. During the month of Ramadhan, [40], recorded a decline in stock returns, though the mean return did not indicate a significant change.

The Monday effect came into the limelight in the early of 1920s. The data was based on a three year analysis of the US stock market which picked out that on Monday is the worse day to buy stocks, [41]. In a different study which was performed by Hirsch in 1968, he reported that Monday did not give any positive returns, [42]. The mean returns of the S&P 500 for the period between 1953 and 1970 for Friday proved to be higher than mean return on Monday, [43]. Another study by Gibbons and Hess in 1981 on the Day of Week (DOW) effect in US stock returns of S&P 500 and CRSP indices while using a sample of data from 1962 to 1978, found out that there were negative returns on Monday and coincidentally higher returns on Friday, [44]. Of great interest was that [45] recorded same findings.

[46], discovered that in the stock markets, the minimum returns happened on Monday in U.K and Canada markets. However they discovered that the same occurred on Tuesday in Japanese and Australian markets. Thailand, Malaysia, Philippines, South Korea and Taiwan, which form part of Southeast Asian stock markets, it was discovered that neither Philippines nor South Korea had significant calendar effects, [47]. However, they recorded that on Monday there was a significant positive return while on Tuesday there was significant negative return in Thailand and Malaysia, [47].

[48], researched on 11 Eastern Europe major stock market indices between 1990 and 2002. They reported that there was negative returns on Monday in six stock markets and while the remaining nations had positive returns. After studying the European markets, the researchers went ahead to study seasonal effects in an Asian nation, India. While studying the presence of seasonal effect in BSE Sensex, India, the researchers discovered that indeed there was the presence of January effect in the stock market, [49].

According to [34,50,51], beginning-of-the-month effect is when the returns of stocks of a firm are higher in the first few trading days of the month. The beginning-of-the-month effect is considered to be another form of seasonal effects. It is also said to be experienced when the stock earnings in some months are significantly higher or lower than in others, [31,52,53]. A current research by [34], recorded that there was no evidence in 34 international stock markets for the January effect.

Among the most celebrated seasonal anomalies is the day-of-the-week, especially the Monday effect. Monday effects display significantly non-positive average returns in the US stock market, [54,55]. [46] reported the same anomalies as indicated above in the international stock markets. Weekend effect comes into play when the prices of stocks have a high likelihood of falling on a Monday.

This means therefore means that the closing price of stocks on Monday is usually less than the closing stock price of previous Friday, [45].

In emerging African stock markets, [56], researched on day-of-the-week effect in South Africa, recorded higher returns on Monday in years between 2001 and 2006. [57], also explored the South Africa stock market and recorded the presence of the month-of-the-year effect and noticed higher earnings in February in the years between 1997 and 2006. [58], reported lower returns on Friday in South Africa stock markets. [59], through their study did not report any presence of weekend and January effects in South Africa.

[60], while researching on turn-of-the-year effect in the Ghanaian, Nigerian and Zimbabwean stock markets, did not trace seasonality in the Nigerian and Zimbabwean stock markets while recorded seasonality for Ghanaian stock market. January effect was present for Ghanaian while there were no evidence for Nigerian and Zimbabwean stock markets, [60]. [61], on Mondays recorded significant negative earnings while significant positive earnings on Wednesdays for the shares in the Johannesburg Securities Exchange (JSE) between 1978 and 1983. [62], investigated and confirmed that between 1978 and 1998 most of the seasonal anomalies are not present anymore in Johannesburg Securities Exchange (JSE).

[63], investigated seasonality in nine African stock markets. They confirmed significant Monday effects in Botswana and Morocco. They also noticed significant Turn of Month (TOM) effects on the Egyptian and Mauritian stock markets. However the Turn of Month (TOM) effects could not be traced in the Egyptian and Mauritian markets after removal the Turn of Year (TOY) effects. This indicates that TOM effects could be TOY effects in these markets. The TOY effects were evidenced in Egyptian and Zimbabwean but absent in the Mauritian market.

[64], while examining five stock markets in Africa for the Day of the Week (DOW) effect presence recorded that Ghanaian and Nigerian stock markets did not experience significant negative returns. There was presence of negative returns in Botswana and Egypt on Tuesday while in South Africa, the JSE on Wednesday had a negative return. Highest return was seen on Wednesday in Botswana, Ghana and Nigeria but on Monday in South Africa. DOW effects were not evidenced in Botswana, Egypt, Ghana, Nigeria and South Africa between 1997 and 2004, [64]. [65] also noticed the DOW effects on the Mauritius Stock Exchange and the study further revealed that returns on Friday were highest.

In Kenya through Nairobi Securities Exchange (NSE), [66], evidenced that average earnings were significantly negative on Sunday and Monday, while positive for all other trading days. Thursdays had significant positive return that shows significant presence Day of Week (DOW) effect in NSE. This may mean that a probable justification for such a result might be because of the news which is economically positive which trickles at the end of the week. This makes the investors to have confidence and invest in the stocks that end up making Thursdays to have positive returns. Coincidentally, negative economic news is usually presented at the start of the week which makes

investors to dispose-off their stocks which brings in negative returns on Mondays, [66].

[67,68], stated that origin of financial distress in firms were; lack of technical skills-management team is unbalanced, hostile economy which results into demand reduction, interest rates increase and worsening foreign exchange, lack of innovation, natural calamities, bankruptcy of a major customer, low price competition, employees high turnover and government policy changes. According to [69], financial distress arises in firms mainly due to the agents of the firms who are the managers, mostly consider short term profit goals at the expense of the long term ones. Financial distress may out-turn in being without main customers, suppliers and more often than not the key employees, [67]. The management should spend more time in strategizing on the core business of the firm instead of wasting time in managing financial distress.

[70], while studying financial distress, they linked it to a firm's failure. Failure refers to situation where a company's required rate of return is not met. This means the firm has failed to achieve the set targets at the beginning of the financial year. They also equated financial distress to insolvency which basically means that a firm is not able to meet the liquidity levels required. This may lead to the firm not meeting obligations and contracts which are associated by law suits against the firm. Financial distress prediction has become an integral part of corporate governance as it helps all the stakeholders analyse the company on the direction its taking. Accordingly, Kenya has experienced its fair share of firms which are in financial distress and almost on the verge of collapsing. This therefore begs the question as to whether these crises could have been predicted before the actual events.

There are various theories which can be related to this study. Theories came into existence to justify, foretell and understand a phenomena. In most cases theories also came in to provoke and expand the present knowledge inside the boundaries of crucial present premises. [71], state that a theoretical framework acts as a guide to research, dictates which variables are for evaluation and which statistical associations to be considered in the context of a problem under research. The theories which will be considered are; EMH, Tax Preference Theory of Dividends, Wreckers Theory and Z-Score Model.

## 2.2. Conceptual Framework

[72], points out that conceptual framework brings about main aspects, establishes variables and presupposes association amidst them.



Figure 1. Conceptual Framework

## 3. Research Methodology

[73] categorically points out that research methodology is the general principle that gives direction to the research.

[74] also acknowledge that research methodology concentrates on the demonstration of the techniques used in conducting the study. It comprises of research design, population of the study, scope of the study and sources of data.

### 3.1. Research Design

[75] said that research design is necessary or paramount because it assists in the smooth sailing of the various research operations. This study adopts the descriptive research design. [76], state that a descriptive research design is planned to take the picture as it is basis or the way it naturally occurs. [77], descriptive research enables an in depth study of phenomena or characteristic associated with the subject population such as to who, what, when, where and how of the subject. [78], objectives of a descriptive research are identifying present conditions, needs, studying immediate status of a phenomenon, finding out facts about a problem and explaining the relationships of traits and characteristics.

### 3.2. Population of the Study

Population refers to a whole unit of individuals, events or objects possessing routine visible attributes, [79]. It is the entire group of people, happenings or things of concern that a researcher is investigating, [80]. [81], states that population is the total units from which data is to be collected. In this study census is considered as it all the firms in the Nairobi Securities Exchange. Census is more advantageous as it solves the problem of accuracy which is associated with sampling, [82].

### 3.3. Scope of Study

The study covers a period of 11 years from 1<sup>st</sup> January 2007 to 31<sup>st</sup> December 2017.

### 3.4. Sources of Data

This study relies heavily on the quantitative and secondary data collection methods. In secondary data collection, a researcher simply relies on the works of another to get on moving with their intended study. [84], secondary data must be suitable, adequate and reliable. The study used panel data technique for the 11 year period, 1<sup>st</sup> January, 2007 to 31<sup>st</sup> December, 2017, to explore the relationship between seasonal anomalies and financial distress of listed firms in the Nairobi Securities Exchange. Regression coefficients were made clear by the application of the E-views software output. Annual data encompassing the entire period of study were considered as this was to ensure that there was enough degrees of freedom estimations in the models. The secondary data was acquired from published annual financial reports of all firms in the Nairobi Securities Exchange. Also relevant literature in magazines, websites and other relevant secondary sources formed part of secondary data.

## 4. Results

The results of this study were relayed by the use of

descriptive statistics, correlation analysis, unit root tests and panel regression equation. The interpretation of the regression coefficients were modeled by the utilization of the E-views software output.

### 4.1. Descriptive Statistics

Descriptive statistic is a summary statistic that describes quantitatively the features of data. Descriptive statistics are utilized in the presentation of the quantitative descriptions in a form that can be managed easily, [85]. This study therefore seeks to determine the spread of data that comprise of the calculations of the mean, standard deviation, standard errors, maximum and minimum values of the variables overtime. This further involved finding the correlation matrix in order to ascertain variables which were highly correlated as this would assist in avoiding the issue of multicollinearity which is common occurrence in time series data.

In this study, the data was changed into their natural logs so as to deal away with the challenges of these large numbers as this will also to see the elimination of heteroscedasticity. It also considered correlation analysis as a mean of checking the variables which are highly correlated with the sole aim of reducing the problem of multicollinearity which is very common face in time series data. It further involved the normality tests which are in the form of skewness, kurtosis and Jarque-Bera, [86].

Table 1. Descriptive Statistics

	LN_Z	LN_SA
Mean	0.919192	2.108684
Median	0.917689	2.302585
Maximum	1.942604	4.564348
Minimum	-0.580257	0.000000
Std. Dev.	0.574154	1.174280
Skewness	-0.030158	-0.352885
Kurtosis	2.264766	2.190527
Jarque-Bera	2.947791	6.247360
Probability	0.229032	0.043995
Sum	119.4950	274.1289
Sum Sq. Dev.	42.52527	177.8824
Observations	130	130

Notations:

LN\_ - Natural log of

LN\_Z - Natural log of Z-Score

LN\_SA - Natural log of Seasonal Anomalies.

#### 4.1.1. Financial Distress

Financial distress is measured through equations 2.3 and 2.4 which result into Z-score, [87]. Out of the 67 listed firms in NSE, financial distress which is the dependent variable had a skewness value of -0.0302 which meant that it was negatively skewed and thus the curve was not normally distributed as the value was not zero. The kurtosis value was 2.2648 signified that the curve was mesokurtic as this value was less than three and thus not

normal. A Jacque-Bera value of 2.9478 meant that this curve was not normally distributed as the value was not close to zero. Thus the data in financial distress is not normally distributed.

#### 4.1.2. Seasonal Anomalies

Seasonal anomalies had a skewness value of -0.3529, which signified that the curve is negatively skewed as the value is not equal to zero. Kurtosis value of 2.1905, meant that this curve was mesokurtic as it was less than three, thus not normally distributed. Jarque-Bera value of 6.2474 meant that data is not normally distributed as the value is not close to zero. Thus, in normality tests, the results showed that the data for seasonal anomalies under consideration were not normal.

## 4.2. Correlation Analysis

Table 2. Correlation Analysis

	LN_Z	LN_SA
LN_Z	1.000000	
LN_SA	0.082999	1.000000

In Table 2, Seasonal anomalies had a coefficient of 0.0830 signifying a weak positive correlation with the Z-score. This is so because the value is below 0.2 which is the threshold. This therefore means that when seasonal anomalies is increased by 0.0830 per year then the Z-score is increased by one percent in the subsequent year. This consequently means that an increase of 0.0830 of a unit of seasonal anomalies attracts an increase of a unit of financial distress in the subsequent year.

## 4.3. Unit Root Tests at Intercept and Level I (0)

In the panel unit root test framework, various tests have been developed. These tests are; Levin, Lin and Chu, Im, Pesaran and Shin, Augmented Dickey-Fuller, Plackett and Pearson and fisher type tests, [88,89,90,91]. The main limitation of these tests based on the assumption of cross-sectional independence across variables. In this section, the study critically analyses the dependent variable, financial distress and the independent variables which include dividend yield and price to earnings anomalies independently with their measures in determination whether the variables possess the unit root or not.

#### 4.3.1. Financial Distress

Financial distress was found to be stationary at intercept and level I (0) because the Levin, Lin and Chu (LLC); Im, Pesaran and Shin (IPS); Augmented Dickey-Fuller (ADF); Plackett and Pearson (PP) had probability values of 0.0000 which were significant at one percent level of significance. Therefore, we fail to accept the null hypothesis that dependent variable, financial distress has a unit root.

Table 3. Panel Root Test for FD

Panel unit root test: Summary				
Series: LN_Z				
Method	Statistic	Prob.	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu	-23.2433	0.0000	48	446
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-5.75092	0.0000	48	446
ADF - Fisher Chi-square	170.348	0.0000	48	446
PP - Fisher Chi-square	188.212	0.0000	48	454

#### 4.3.2. Seasonal Anomalies

According to Table 4 below, the LLC test statistic had probability values of 0.0000 which is significant at one percent level of significance. IPS test had probability values of 0.0000 which is significant at one percent level of significance. Augmented Dickey-Fuller had probability values of 0.0213 which was significant at five percent level of significance. Plackett and Pearson had probability values of 0.0109 which was significant at five percent level of significance. Since the p-values of the results of the tests under consideration were less than the level of significance, therefore we fail to accept the null hypothesis that there was a unit root. This thus meant that seasonal anomaly was found to be stationary at intercept and level I (0).

Table 4. Panel Unit Root Test for SA

Panel unit root test: Summary				
Series: LN_SA				
Method	Statistic	Prob.	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
LLC	-15.5628	0.0000	10	36
Null: Unit root (assumes individual unit root process)				
IPS	-7.22655	0.0000	4	19
ADF	32.1087	0.0213	9	34
PP	34.4997	0.0109	9	34

## 4.4. Panel Regression Equation

The data was lagged by one period since seasonal anomalies experienced in one period tend to have their implications felt in the subsequent periods. In panel regression equation there is the use of Hausman test, which was applicable to all the variables under consideration, [92]. In Hausman test, Chi-square test statistic was considered in determination of the level of significance. This led to decision making on whether to adopt the fixed effects model or random effects model.

$$\gamma_{it} = \beta_0 + \sum_{i=1}^k \beta_i X_{kit} + \epsilon_{it} \quad (1)$$

Where  $X$  is the independent variables;  $X_1$  is seasonal anomaly,  $\gamma_{it}$  is the dependent variable denoting financial distress of firm  $i$  at time  $t$ ,  $X_{it}$  is the independent variable of firm  $i$  at time  $t$ ,  $\beta_0$  is the constant term,  $\beta_i$  is the coefficient of the independent variables.

#### 4.4.1. Hausman Test

Table 6 was used in determination of the most suitable model to be used in this study which is choosing between fixed effects model and random effects model. The Chi-square test statistic was 18.4369 with a significant probability value of 0.0052 which was significant at one percent level of significance. When the probability value is more than 0.05 we accept the use of random effects model and when the value is less than 0.05 then this allows the applicability of the fixed model. Table 5 gave a probability value is 0.0052 which is less than 0.05 and thus the adoption of the fixed effects model.

**Table 5 Correlated Random Effects - Hausman Test**

Correlated Random Effects - Hausman Test				
Equation: EQ02FIRSTDIFFERENCE				
Test cross-section random effects				
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.	
Cross-section random	18.436861	6	0.0052	
Cross-section random effects test comparisons:				
Variable	Fixed	Random	Var(Diff.)	Prob.
DSA	0.006627	-0.008949	0.000030	0.0044

Notations;

- D - First Difference of
- DSA - First Difference of Seasonal Anomalies
- DZ - First Difference of Z-Score.

#### 4.4.2. Fixed Effects Model

This is analyzed in all the independent variables with their measures being taken into consideration as per Table 6.

**Table 6. Fixed Effects Model**

Dependent Variable: FD				
Method: Panel Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DSA	0.006627	0.011076	0.598290	0.5662
C	-0.010649	0.018645	-0.571121	0.5836
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.964596	Mean dependent var	-0.005585	
Adjusted R-squared	0.845108	S.D. dependent var	0.203078	
S.E. of regression	0.079924	Akaike info criterion	-2.164000	
Sum squared resid	0.051103	Schwarz criterion	-0.932374	
Log likelihood	66.95200	Hannan-Quinn criter.	-1.734130	
F-statistic	8.072745	Durbin-Watson stat	3.492419	
Prob (F-statistic)	0.002294			

R-squared is at 0.9646, signifying that 96% of fundamental anomalies are explained by financial distress which leaves only 4% to be explained by other variables. The adjusted R-squared has a value of 0.8451 which depicts that 85% of the fundamental anomalies can be explained by financial distress. Also it is note that the difference between the R-squared and adjusted R-square is 11% which is less than 20% meaning that the fixed effect model is very stable.

## 5. Findings

It has been found out that the data in seasonal anomalies are not normally distributed. This is so as the values of skewness, kurtosis and Jaque-Bera have confirmed so as presented earlier. This finding is not far from the truth as it concurs with both [93,94] findings. Data being not normally distributed can be due to data can never be normal because of asymmetries, discreteness, boundedness and existence of outliers.

This study explored and found out that there exists a negative and significant relationship between seasonal anomalies and financial distress of listed firms in NSE, Kenya. This signifies that in case of any slight change in seasonal anomalies, then the financial health position of the firms listed in NSE also changes and unfortunately the change is for the worse meaning that the financial health of the firms deteriorate. Actually this means that the regulators, Capital Market Authority and Nairobi Securities Exchange must have all it takes to foretell that the firms stocks will have to face the seasons' shocks so as to be prepared to put in place the financial shock absorbers.

In the outcome of the Hausman Test, the Fixed Effect Model was preferred to the Random Effects Model as the result value was 0.0052 which is less than 0.05. The fixed effects model which was as a result of the Hausman Test, was found also to be stable as the difference between the R-squared and adjusted R-squared was less than 20%, in fact actually at 11%.

## 6. Conclusion

The study explored and found out that there was a positive relationship between seasonal anomalies and financial distress of listed firms in Nairobi Securities Exchange and that the relationship was significant. This signified that there was a link between seasonal anomalies and financial distress. Thereby, this confirms the application of the Efficient Market Hypothesis which focuses on the Random Walk Hypothesis (RWH), [95].

The findings of this study confirms the result by [66] while conducting a study on stock market anomalies, Nairobi Securities Exchange, which specifically was about seasonal effects on the average returns of the stocks. They established that in December and January, the stock prices were low and unattractive. Also they found out that due to the negative economic news which was usually presented at the start of the week, it made investors dispose-off their stocks which brought in negative returns on Mondays. The result was a confirmation that indeed there exists a positive relationship between seasonal market anomalies and financial distress in NSE, [66].

## 7. Recommendations

The results have demonstrated that seasonality cannot be avoided. The management should be aware that financial or market risks cannot be avoided but they can only be mitigated. It is therefore recommended that the management has to put in place mitigants so as to avoid

the harsh repercussions of the effects of seasonal anomalies. In such difficult times, the management ought to have put in place measures that will help in safeguarding the firms' financial health.

Before making an investment decision, the investors need to engage experts who will be mandated to carry out due diligence on the listed firms before investing in them. As the study has pointed out that firms which are about to experience can be predicted in two years before this happens, then potential investors should be wary and not invest in such stocks. If they do, then definitely in two years to come, they will lose their wealth. Investors should invest in financially healthy firms. It is also important for the investors to understand seasonal anomalies through experts as they enable investors to take advantage of regular shifts in the market by designing trading strategies.

The conclusions over the relationship of this study will assist the government, through Kenya Revenue Authority (KRA). KRA should have the capability and capacity of unearthing this infamous practice of tax evasion or tax fraud when it comes to paying taxes by firms. The top management do this by successfully by failing to declare dividends to shareholders and converting the same to shares and reinvesting this into the firm's operations. The KRA should work around the clock to prove that this is actually is tax evasion and not tax avoidance as the latter is not illegal while tax evasion is illegal. Tax is a vital component which any government of the day as the funds generated from it are used for development projects in the country.

The government through the media regulatory bodies are supposed to be in full control of the media content as any negative information about the market trends is capable of creating a sense of panic which can be very detrimental to the economy. This can result into the investors moving funds away from stocks to less risky investments. If such an action takes place, then the stock prices are even depressed further. Thus the government through bodies like the Media Council of Kenya, Communications Authority of Kenya and the likes should vet all information especially stocks market information before it is out to the public.

The findings of this study set a ground for further research in a number of areas. Firstly, seasonal anomaly has not been exhaustively dealt with especially in listed firms in NSE. Further research should be carried out to find out the occurrence of seasonality on hourly, daily, weekly and annually basis in the NSE. With this, then researchers and scholars will have a ground to carry out further researches.

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