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Detecting Market Anomalies: Do Evidences Hold in Nigeria?

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Abstract

In this study, we presented robust analyses of the Nigerian equity market using weekly stock prices of 140 listed companies in Nigeria over the period of Jan 1 2006 to Dec 27 2012. We adopted two sets of tests. The first set comprises Llliefors, Cramer-Von-Mises, Anderson-Darling and Ljung-Box which confirmed that stock prices are not normally distributed. But the second set includes size/rank variance ratio tests and TGARCH in mean technique. The tests jointly revealed strong presence of inefficiency as anomalies can be traced to persisted volatility, lack of randomity, significant effects of information and heteroskedasticity/leptokurtic nature of stock prices. We therefore conclude that the information plays significant role in Nigerian stock market.

Keywords: Anomalies; Normality; Volatility; Heteroskedasticity; Randomity; Information

Introduction

Market anomalies are basically referred to inefficiency or failure of any of the pricing models to hold. Precisely, irregularities such as presences of volatility, normality, linear dependency, serial correlations, autocorrelation and absence of randomity in stock prices or their first differences are common evidences of anomalies. Anomalies make prediction, speculation and arbitraging possible which induces addition earnings to an investor at the detriments of others. It is important to know that anomalies cannot be completely averted; once they appear in well-functioning markets they quickly die off through the activities of professional arbitrageurs. The question is how long do they persist? If they persist in a short time, the efficient status of markets may not be distorted to considerable heights but a long time situation is a serious issue. Therefore, investigating the sources of anomalies and their life spans are currently raging issues in finance.

The studies on market anomalies have been mixed to date; for example Fama and Schwert [1] discovered that excess returns on the NYSE were predictable; while in the study of Fama and French [2], it was concluded that dividend yield could be used in predicting stock returns. Also, Oran and Shiller [3] indentified excess volatility as a potential anomaly. In the perspective of Silver, anomaly financial market could be seen as a stock market in which the movements of returns deviate from the assumptions of efficient market hypothesis or cannot be explained by any of the widely known acceptable market principles. Madiha et al. [4] emphasized that the basic types of anomalies in the world financial markets were fundamental, technical and seasonal anomalies. The most critical of these three is the fundamental that span into future time horizon. Kadir [5] arguably pointed that the most commonly seen anomalies were the volume, volatility, cash dividends, equity premium puzzle and predictability.

Obviously, there are different conclusions on the various types of anomalies as revealed by Silver and Kadir. But the egregious shortcoming of these studies is that they are all conceptual studies, a mere review of the literature which poses doubts to their conclusions. Therefore, the needs to carry out a thorough empirical study and to identify the types of anomalies in the stock markets based on methodological frameworks are the driving forces behind this study. Although, studies on market anomalies have not be essentially carried out in Nigeria; this further justifies the needs for this study. Overall we are motivated to employ batteries of tests in a compacted form which are somewhat different from those used in the studies that associate with African emerging countries, to detect the types and duration of anomalies in the Nigerian equity market. The paper is structured as follows: section one has already discussed the introduction while section two stresses on literature review, in section three we present the methodology and data, finally sections four and five deal with results and conclusion respectively.

Literature Review

The issues of how market frictions influence stock prices and thereby artificially creating apparent anomalies to persist have received increasing attentions in finance. Fama and Schwert Used data set ranging from 1953–1971 and documented a reliable negative relationship between aggregate stock returns and short-term interest rates. Since market efficiency theory is presumed upon the maxim that the higher the risk the higher the return, therefore the negative risk-return relationship is an indication of an anomaly.

Shleifer and Vishny [6] have argued that agency problems coupled with professional money managers including transactions costs could cause mispricing to persist and that many anomalies were as a result of such market irregularities. It has been documented that poor stock return performance will generally lead to higher leverage, due to the fact that the value of the firm's debt will exceed the value of the stock and many of the stocks earning the highest returns have the lowest prices, whereas highly priced stocks produce low returns; this anomaly was indentified in the work of Ball et al. [7].

Brav and Gompers [8], also Brav et al. [9] have examined the returns to initial public offer (IPO) firms over the 1975–1992 [10] periods and discovered that underperformance was mainly concentrated in small firms with low book-to-market ratios and concluded that Fama and French [11] indicated this same behavior in their tests of the three-factor model and that the IPO anomaly was a reflection of a general problem in pricing small firms with low book-to-market ratios. Brav et al. also studied seasoned equity offerings (SEOs) and stressed that momentum helped to explain the behavior of returns after SEOs. In the same way, Eckbo [12] have shown that the reduction in leverage that occurs when issuing new equity declines subsequent equity risk exposure thereby contributing to the apparent anomalous behaviors of returns following SEOs.

Booth and Keim [13] demonstrated that the turn-of-the-year anomaly was not significantly different from zero in the DFA 9–10 portfolio returns over the 1982–1995 periods. They said that the lowest-priced and least-liquid stocks apparently explained the turn-of-the-year anomaly. This means that the costs of illiquidity as one of the market microstructure effects play an important role in explaining some anomalies. Bostancı [14] specifically affirmed that anomalies are the observed market movements that are not explained by the arguments of the efficient market hypothesis. Bostancı [14] and Oran [15] said that If investors are rational as stated in the efficient market hypothesis, they do not have to trade too much except when they are in need of liquidity and have desire to re-construct their portfolios but evidences have shown today that the volumes of transactions are consistently increasing without any moment of decrease over the years in both transitioned and emerging capital markets. This arbitrarily repositions these markets for various forms of anomalies. Oran also confirmed that there were too many cases of excess volatility observed in stock markets that could not be explained in the perspectives of the market efficiency.

Daniel and Titman [16] proposed several methods for constructing more appropriate test portfolios and designing more powerful tests than the set of recent papers on conditional CAPM. They revealed that the tests on the empirical validity of their proposed models were rejected at high levels of statistical which indicated inefficiency or anomaly since the prepositions on which the models stood did not hold.

The study by Chandra and Islmia (2009) examined the calendar effect anomalies in Bombay Stock Exchange (BSE) and showed that the turn of the month and time of the month effects were significant in the return of the BSE 30 securities. Guidi, Gupta, and Maheshwari (2010) employed the autocorrelation analysis, runs test and variance ratio test to test the weak form of the efficient market hypothesis for Central and Eastern Europe (CEE) equity market over 1999-2009 periods and discovered that the stocks in these markets did not follow the pattern of a random walk. They also applied the Generalized Autoregressive Conditional Heteroskedasticity in Mean (GARCH-M) model for these stocks and further confirmed the inefficiencies of these markets. Therefore, according to them, an informed investor could make abnormal profits by studying the past prices of the securities in these markets. The holiday effect and turn-of-the-month effect are significant in the Portuguese stock market [17]. Deev and Linnertova [18] examined intraday and intraweek market returns on the Czech stock market for the search of time and seasonal anomalies. Their results revealed that time-varying nature was present in the index of the Czech stock market which has implication for changing the efficiency of the market. Additionally, they found that there was significant hour-of-the day effect that is open jump effect in this market index [19].

Hsieh and Hodnett [20] affirmed that when the firm size was proxied with price-insensitive fundamentals there was tendency that the effect of the size anomaly dissipated in the global equity market. Yan and Zhao [21] examined the nexus between the post-earnings announcement drift and the value-glamour anomaly over the period June 1984 to December 2008 on the United State stock markets; taking the size effects into consideration, they confirmed that value stocks responded more swiftly to positive earnings surprises and more slowly to negative earnings surprises. They then concluded that value stocks may manifest large information uncertainty. Hsieh and Hodnett [22] re-examined the Johannesburg Stock Exchange (JSE) over the period 1993 to 2009 based on overreaction hypothesis and revealed that the strength of mean reversals was stronger when investor sentiments were lower. They claimed that this situation was particularly so during financial market crises. Furthermore they argued that since mean reversals of stock prices were as a result of investor overreaction to changes the timing of mean reversals might be cyclical in nature.

Methodology

We employ two types of models in this study: parametric and non-parametric. The non-parametric models have been pervasively used in the literature in detecting market anomalies or efficiency. However, a critical discussion of a few of these models is presented below.

Variance ratio (VR) model specification

The specification of the VR model is a non-parametric model that was developed by L_o and Mackinlay [23]. Generally, the VR mechanism test the hypothesis that a given time series is iid compliant and it can be defined as:

$$VR_{z(q)}=\frac{VR(h)-1}{\theta\sqrt{(h)}}\sim\mu(0,1) \qquad (1)$$

$$VR_{z(q)}=\frac{VR(h)-1}{\theta(h)0.5}\sim\mu(0,1) \qquad (2)$$

$$.\theta(h)=\frac{2(2h-1)(h-1)}{3h(nh)}. \quad (3)$$

Where: $VR_{Z(h)}$ represents the computed variance ratio; θ(h) means the asymptotic variance of the variance ratio order under the assumption of homoscedasticity and n(h) implies the number of observation. According to Darrat and Zhong [24], it was affirmed that if the computed variance ratio ($VR_{Z(q)}$) is smaller than one, it indicates negative serial correlation but if $VR_{Z(q)}$ greater than one, that means positive correlation; however, if $VR_{Z(q)}$ is equivalent to one, there is evidence of homoskedasticity implying that the null hypothesis of no heteroskedasticity or presences of random walk cannot be rejected for the specified series [25].

Cramer-von-mises non-parametric model

The Cramar-Von Mises' specification is essentially hinged on both cumulative distribution function (LDF) and ECDF because it draws a comparison between the two; thus it can be expressed as:

$$z_{cvm}=\int_{-\infty}^{\infty}\left[F_n(X)-F^*(X)\right]^2 d_f{}^*(X) \qquad (4)$$

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Where: Z_{cvm} represents the Cramer-Von mises statistic or criterion

F_n is the ECDF

F^* is the CLDF

x is the time series of stock return/price.

Lilliefors' model specification

Lilliefor [26] proposed a test of normality that can be explicitly derived as follows:

Given a sample of N observations, and x time series (x_t), the sample mean (x) can be expressed as:

$$X=1/N\Sigma^{Nt} \quad (5)$$

The sample variance (δ^2) can then be defined as:

$$\delta^2 = \frac{\Sigma^{N1}(Xt-X)^2}{N-1} \quad (6)$$

While the standard deviation (δ) is given as:

$$\delta = \frac{\sqrt{\Sigma^{N1}(Xt-X)^2}}{N-1} \quad (7)$$

Note that in all cases t=1…………..N.

The first step of the Lilliefors test of normality is to transform the X_t time series to z scores. Therefore,

$$Z_t = \frac{Xt-X}{\delta} \quad (8)$$

Thus the probability associated with Z_t time series can be expressed as:

$$P(Z_t) = \int Zt_{-}\alpha 1/\sqrt{2\pi e^{X}\left(-1/2Z^2 t\right)} \quad (9)$$

Finally, the Lilliefors test (L) is given as

$$L = Max_t[(F(z_t) - P(z_t)\ (F(z_t) - P(z_t{}^{-1}))] \quad (10)$$

Where: $F(z_t)$ is the frequency of the Z_t time series. Other terms had already been defined.

Auderson-darling non-parametric model

Anderson and Darling [27] proposed a non-parametric specification for testing the assumption of normality in time series behavior. Also, their specification depend on the cumulative distribution function (F^*)

$$AD_{Zst} = N - 1/N\Sigma_{i=1}^{N}(2i-1)\left[InF^*(Xi) + In\left(1-F\left(X_{n-i+1}\right)\right)\right]$$
(11)

Where: AD_{Zst} signifies the Z-statistic for AD (i.e. A^2 statistic)

N is the size of the sample

F^* is the cumulative distribution function for the specified series

i is the ith sample when the data series is arranged/sorted in ascending order.

The arch-garch and tgarch model specifications

The ARCH and GARCH frameworks employed in this study are rooted in the time-varying volatility models of Taylor and Bollerslev [28,29]. These specifications can be expressed as:

$$wsp_t=\alpha+\alpha_2 vwsp_t+e_t,\ e_t \sim e(o, \delta^2{}_t) \quad (12)$$

Note that equation 12 is basically referred to conditional mean equation; it can be extended by relating the conditional variance of stock prices to the one lag square of the error term ($e^2{}_{t-1}$) as:

$$vwsp_t=b_0+b_1e^2{}_{t-1} \quad (13)$$

Equation (13) is the ARCH Specification.

Introducing the lag one of conditional variance term into equation (13) leads to the GARCH specification. Thus,

$$vwsp_t=c0+c_1e^2{}_{t-1}+c_2\ vwsp_{t-1} \quad (14)$$

Both equations 13 & 14 are called conditional variance equations.

wsp_t=is the weekly average prices at time (t).

$vwsp_t$ is the conditional variance of prices at time t

b_1 and c_2 are the coefficients of the ARCH and GARCH terms respectively. If they are significant it implies the rejection of the null hypothesis that there is presence of random walk exhibiting stock prices/returns.

Glosten, Jagannathan and Runkle [30] extended the GARCH model and renamed it Threshold GARCH (TGARCH) Model. In this study, we refined their specification as presented below:

$$vwsp_t=a_0+a_1e^2{}_{t-1}+a_2De^2{}_{t-1}+a_3vwsp_{t-1} \quad (15)$$

Where: D stands for dummy variable; it takes the value of one when e_{t-1} is positive which implies good news but zero, if e_{t-1} is negative which means bad news. However, if the coefficient of the dummy variable is priced it means information plays significant role in the market and this is a case of anomaly or inefficiency [31].

Box-jenkin Q statistic specification

The BJ [32] statistic was credited to Box and pierce [33] and Ljung and Box [34] as a portmanteau test for linear dependence in time series and it can be expressed as:

$$Q^*=T(T+2)\Sigma^{NL=1}\frac{A^{\wedge 2L}}{T-L} \sim X^{2N} (16)$$

Where: Q^* implies the computed statistic for the BJ

T is the sample size

N is the maximum lag length

L is the lag operator

$A^{\wedge}{}_L$ is the Autocorrelation coefficient at a given lag length which is given

as:

$$A^{\wedge L} = \Sigma^{n-Li=1}\frac{(Xi-E(X))(Xi+L-E(X))}{\Sigma^{ni=1}(Xi-E(X))^2} (17)$$

Where: X_i is the series under investigation

E(X) is the expected value or mean of the series.

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Data

Weakly raw security prices of 140 companies continuously listed in Nigerian Stock Exchange (NSE) were collected over a period of January 2006 to December 2012.

Results

The best way to detect market anomalies is to test the efficient market hypothesis in the weak-form. Rejection of this hypothesis implies that the market is informationally inefficient or characterized with anomalies which make predictions of future occurrences possible. In view of this, we employed variety of tests such as: Lilliefors, Cramer-Von-Mises, Anderson-Darling, Ljung-Box, Variance ratio and Threshold GARCH techniques to investigate if there are anomalies in the behaviors of stocks in Nigeria. The results of these tests are discussed as follows starting from the descriptive property and heteroscedastic nature of these stocks.

The nature of stocks property

The descriptive properties which stocks exhibit can be examined by estimating their mean values, standard deviations, skewness, kurtosis and the volatility nature of their residuals (i.e. the ARCH effect). Thus, Table 1 presents the results of all these properties.

Variable	mean	SD	Skew	Kurt	AR(4)	MA(4)	ARCH-LM(4)
W_{sp}	22.44	4.76	0.06	(25.52)*	1.00*	0.26*	(46.85)*

Lag 4 was selected by Schwarz Information Criterion and Hannan-Quinn Information Criterion. AR(4) and MA(4) indicate Auto regression and Moving Average Specification with 4 lags while ARCH-LM(4) stands for the Lang range multiplier test for Auto regression Conditional Heteroskedasticity with 4 Lags.

The summarized statistics for weakly stock prices over Jan 5, 2006 to Dec 27, 2012 periods are reported in Table 1. The mean value of the stock prices (22.44) is appreciably high. This positive value means that the stock prices have a rising tendency. However, the data are not significantly skewned but they are leptokurtic in nature. Evidences have equally shown that the pattern of stock price distribution in Nigeria follows Autoregression (AR) and moving average (MA) forms as revealed by the significant coefficients of AR & MA at Lag 4. The Langrage multiplier (LM) Statistic is also significant at Lag 4 which indicates that stock prices exhibit very strong conditional heteroskedasticity implying that there is ARCH effect or presence of volatility in the Nigerian stock prices behaviors.

Detecting outliers

Outliers are sudden rises in volatility and they are indications of anomalies in a stock market. Figure 1 below shows the movements of stock price volatility from Jan 5, 2006 to Dec 27, 2012 and we discover the presences of outliers during the periods toward the ending of 2007 up to nearly the middle of 2009. Obviously, these periods coincided with the recent global financial crises of which Nigerian stock market was not spared.

Detecting linear dependency

Linear dependency is an evidence of autocorrelation in a series which can make a prediction possible thereby causing inefficiency. We employ Ljung-Box (LB) testing procedures to check for linear dependency in the average prices of our selected companies. The results of the LB test are reported in Table 2.

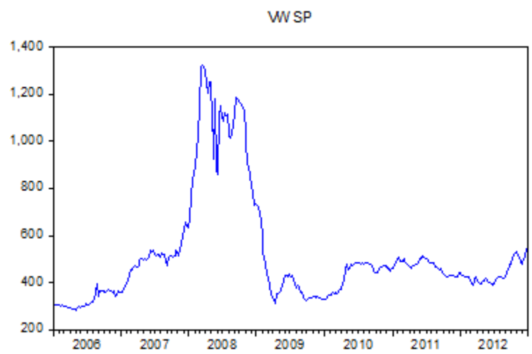

Figure 1: Volatility of Stock Prices for 2006 to 2012.

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
.|*******	.|*******	1	0.99	0.99	360.48	0
.|*******	.|. |	2	0.98	0.022	714.88	0
.|*******	*|. |	3	0.968	-0.121	1061.5	0
.|*******	*|. |	4	0.952	-0.175	1398.1	0
.|*******	*|. |	5	0.936	-0.068	1724	0
.|*******	.|. |	6	0.918	-0.042	2038.3	0
.|******|	.|. |	7	0.899	-0.02	2340.8	0
.|******|	.|. |	8	0.879	-0.06	2630.5	0
.|******|	*|. |	9	0.857	-0.07	2906.7	0

Table 2: Ljung-Box Test Results.

Note that the upper and lower bands are given as ± $(1.96^{*}1/T^{1/2})$ where T is the number of observation in this case 365 therefore the band is -10+10

Table 2 provides the summary of the LB test and it is discovered that all the numeric values of the autocorrelations and partial autocorrelations fall outside the band (-10 to +10). This, by a rule of thumb, the coefficients of the autocorrelations and partial autocorrelation are significant. To corroborate this rule the joint LB test statistics i.e. the observed Q-statistics are larger than the critical x2 statistics at respective lags suggesting that the null hypothesis of no autocorrelation can be rejected at 1% for all numbers of lags. Therefore, the LB test reveals that the successive stock prices are linearly dependent which in turn make prediction possible. This can be considered as a source of anomalies in the Nigerian equity market.

Testing for the presence of a randomity

In this study we employed the rank and size variance ratio tests to examine the validity of the random-walk hypothesis. The test results are indicated in Table 3.

VR Test Type	hp	VR-Ratio	Z-stat	PV
Rank	2	1.32*	6.13	0.00
	4	1.78*	7.97	0.00
	8	2.46*	9.41	0.00
	16	3.23*	9.64	0.00
Size	2	1.26*	4.93	0.00
	4	1.63*	6.39	0.00
	8	2.08*	6.95	0.00
	16	2.62*	7.00	0.00

Table 3: Results of the Rank and Size Variance Ratio Tests. Note: * means significant @ 1%, hp is the holding periods and z-stats are the observed z-statistics for each of the hp's.

Table 3 presents the results of the rank and size variance ratio tests for 2, 4, 8, 16 holding periods. It is clearly observed that in all the periods the observed z-statistics are larger than the critical z-statistic (2.33) at 1%. Therefore, the null hypothesis of randomity can be rejected with 99% confidence. Rejecting randomity is a sign of inefficiency or alternatively an anomaly in the market.

Testing for the presence of normality

Normality exists when a market is inefficient and prices of stocks can be predicted because they follow normal patterns. Therefore, normality is a signal of anomaly, inefficiency and information asymmetry in any stock market. However, we adopted the Lilliefors, Cramer-von-Mises and Anderson-Darling tests for this and the results are presented in Table 4.

Method	Value	Adj. Value	Probability
Lilliefors (D)	0.244445	NA	0
Cramer-von - Mises (W2)	4.656498	4.662877	0
Anderson-Darling (A2)	26.31237	26.36688	0

Table 4: Results of Lilliefors, Cramer-Von-Mises and Anderson-Darling Tests.

Table 4 reports the results of the three tests of normality carried out in this study. As shown in the table the values of the three tests are all significant at 1% given that the p-value (0.00) is less than 0.01 for each of the tests. Thus, there are sufficient reasons to reject the null hypothesis of normality and debunk the claims that there are anomalies in the market.

Test for the presence of volatility

The general notion is that efficient market is void of persistent volatility. Hence, the judgment based on this notion is that volatility clustering/pooling is a signal of inefficiency or anomaly in a market. Also, information plays no significant role in a market; if it does, it is an indication of anomaly. We employed the T-GARCH (m) model to provide evidence of anomaly in respect of volatility and information asymmetry as reported in Table 5.

Variable	coefficient	z-stat	PV
vw_{sp}	0.05*	0.04	0
ε^2_{t-1}	0.41*	7.9	0
$w_{t-1}\varepsilon^2_{t-1}$	0.15*	2.08	0.04
$\ln\delta^2_{t-1}$	0.40*	7.19	0

Table 5: Results of the T-GARCH Equation. * Means signification @ 1%, VW_{sp} is the volatility of weakly stock prices, ε^2_{t-1} is the ARCH term, $W_{t-1}\varepsilon^2_{t-1}$ is the asymmetric term and In δ^2_{t-1} is GARCH term.

The summary of the variance equation is reported in Table 5. First, the coefficient of the volatility (i.e. vw_{sp}) which is the risk element is significant and positive confirming a positive risk-return relationship in the market. However, the coefficients of the ARCH and GARCH terms, which are ε^2_{t-1} and Inδ^2_{t-1} respectively, are summed up to 0.81, very close to unity and these two coefficients are significant at 1%. Thus, these reveal that there is volatility clustering and the effects of ARCH and GARCH are strongly present in the market. Furthermore, the asymmetric term ($w_{t-1}\varepsilon^2_{t-1}$) is significant purporting that information plays significant role in the market. Thus, the market is riddled with information asymmetry which is a typical feature of stock market anomaly.

Conclusion

In this study, we present a thorough analysis of the Nigerian equity market based on its efficient status. The distribution channels of the stock prices are not normal as revealed by the Lilliefors, Cramer-Von-Mises and Anderson-Darling tests; also, the Ljung-Box test gives evidence of autocorrelation or linear dependency in our observed series. However, more sophisticated tests on randomity and heteroskedasticity were also carried using the rank and size variance ratio tests including TGARCH technique. The variance ratio tests provide evidence against random walk; while the TGARCH in mean model estimated values reveal persistent volatility over the study period and that the effect of information on the market is highly significant. These findings are previously confirmed in the study of Guidi, Gupta and Maheshwari (2010) who also applied GARCH in mean model for Central and Eastern Europe equity markets. Thus, the source of market anomalies in Nigerian stock market can be traced to volatility clustering, information asymmetry and strong heteroskedastic/leptokurtic nature of stock prices. We therefore recommend that the Securities and Exchange Commission (SEC) should chuck out sound policy measures to contain the activities of insider traders in the market.

Contribution to Knowledge

Most of the previous studies on the existence of anomalies in stock markets are centered on advanced and Asian emerging markets neglecting the African capital markets particularly the Nigerian one to a large extent. Have identified this gap, we employ a battery of compacted techniques with little difference from those ones adopted in any of the studies conducted in the advanced markets, to test if anomaly exists in the Nigerian stock market. Our findings provide overwhelming evidence in support of market anomaly in Nigeria and thus cue behind the study of Guidi, Gupta and Maheshwari (2010).

References

1. Fama EF, Schwert GW (1977) Asset returns and inflation. J Financ Econ, 5: 115–146.
2. Fama EF, French KR (1988) Dividend yields and expected stock returns. J Financ Econ 22: 3–25
3. Shiller RJ (1989) Market Volatility. MIT Press, Cambridge, MA.
4. Madiha L, Shanza A, Marian F, Samia F (2011) Market efficiency, market anomalies, causes, evidence and some behavioural aspests of market anomalies. Research J Financ Account, 2: 1-13.
5. Kadir CV (2010) Market rationality: Efficient market hypothesi versus market anomalies. Eur J Econ Polit Stud 3: 23-38.
6. Shleifer A, Vishny RW (1997) The limits of arbitrage. J Financ 52: 35–55.
7. Ball R, Kothari SP, Shanken J (1995) Problems in measuring portfolio performance: An application to contrarian investment strategies. J Financ Econ 38: 79–107.
8. Brav A, Gompers PA (1997) Myth or reality? The long-run underperformance of initial public offerings: Evidence from venture and nonventure capital-backed companies. J Financ 52: 1791–1821.
9. Brav A, Geczy C, Gompers PA (2000) Is the abnormal return following equity issuances anomalous? J Financ Econ 56:209–249.
10. http://mpra.ub.unimuenchen.de/21290/1/MPRA_paper_21290.pdf
11. Fama EF, French KR (1993) Common risk factors in the returns on stocks and bonds. J Financ Econ 33: 3–56.
12. Eckbo BE, Masulis RW, Norli O (2000) Seasoned public offerings: Resolution of the new issues puzzle. J Financ Econ 56:251–291.
13. Booth DG, Keim DB (2000) "Is There Still a January Effect?" in: DB Keim and WT Ziemba (eds.), Security Market Imperfections in Worldwide Equity Markets. Cambridge: Cambridge University Press, 169-178.
14. Bostancl F (2003) Davranisçi Finans. SPK Yeterlilik Etüdü, stanbul .
15. Oran JS (2008) Fildii Kuleler Sars1l1yor,Öneri:Marmara Üniversitesi Sosyal Bilimler Dergisi, 29: 33-42.
16. Daniel K, Titman S (2012) Testing factor model explanations of market anomalies. Financ Rev, 1: 103-139.
17. Silva PM (2010) Calender anomalies in the Portuguese stock market. Anal J, 71: 37-50..
18. Deev O, Linnertova D (2012) Intraday and intraweek trade anomalies on the Czech stock market. Acta univ.agric. et silvic. Mendel. Brun, 60: 79–88.
19. http:mpra.ub.uni-muenchen.
20. Hsieh H, Hodnett K, Rensburg PV (2012) Fundamental indexation for global equities: does firm size matter? J Appl Bus Res 28: 105-114.
21. Yan Z, Zhao Y (2011) when two anomalies meet: the post- earnings announcement drift and the value-glamour anomaly. Financ Anal J,67: 46-60.
22. Hsieh H, Hodnett K (2011) Tests of the overreaction hypothesis and the timing of mean reversals on the Johannesburg securities exchange (JSE): the case of South Africa. J Appl Financ Bank. 1: 107-130.
23. Lo AW, MacKinlay AC (1988) Stock market prices do not follow random walks: Evidence from a simple specification test. RevFinanc Stud, 1.41-66.
24. Darrat AF, Zhong M (2000) On testing the random-walk hypothesis: A model-comparison approach. Financ Rev 35: 105-124.
25. Worthington AC, Higgs H (2004) Random walks and market efficiency in European equity markets. Glob J Financ Econ 1: 59-78.
26. Lilliefors HW (1967) On the Kolmogorov-Smimov Test for normality with mean and Variance Unknown. J Am Stat Assoc 62: 399-402.
27. Anderson TW, Darling DA (1952) Asymptotic theory of certain goodness-of-fit criteria based on stochastic processes. Ann Math Stat 23: 169–313.
28. Bollerslev T (1986) Generalised autoregressive conditional heteroskedosticity. J Economet 31: 307-327.
29. Taylor SJ (1986) Forecasting the volatility of currency exchange rate. Int J Forecasting 3: 159-170.
30. Glosten L, Jagannathan RR, Runkle DE (1993) On the relation between the expected value and the volatility of the nominal excess return on stocks. J Financ 48: 1779-1801.
31. http://www.investopedia.com/articles/stocks/08/market-anomaly-efficient-market.asp
32. Box GEP, Jenkins GM, (1976) Time series analysis: Forecasting and control. (2nd edn), Holden-Day San Francisco, USA.
33. Box GEP, Pierce DA (1970). Distributions of residual autocorrelations in autoregressive integrated moving average models. J Am Stat Assoc 65: 1509-1526.
34. Ljung GM, Box GEP (1978) On a measure of lack of fit in time serials models. Biometrical 65: 297-303.