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Abstract: The main behavioral bias important in order to understand the trading puzzle is overconfidence. Investor overconfidence behavior is the tendency to be more confident in our ability to act ethically than is objectively justified by our abilities and moral character. Investor overconfidence behavior shows why investors trade the way they do and the judgements they make in their investment decision making leading excessive trading. The objective of the study was to determine the effect that investor overconfidence behavior on stock market reaction in Kenya. The target population was 67 listed companies at the Nairobi Securities Exchange. A sample of 48 listed companies was used for analysis. Secondary data extracted from Nairobi Stock Exchange historical data of listed companies for the period 2004 to 2016 was used for analysis. The study adopted quantitative research design. Unit root results showed that the variables were stationary. Panel data regression was used to analyze data. Panel Dynamic Least Squares technique was used in this analysis. Results were statistically significant with a t-statistic value of -2.187990 and the p-value was found to be 0.0293. In conclusion, investor overconfidence variable has a significant effect on stock market reaction.

Keywords: Overconfidence Behaviour, Stock Market Reaction, Behavioral Finance and Stock Market Efficiency.

1. INTRODUCTION

Overconfident investors overestimate the precision of their own valuation abilities, in the sense that they overestimate the precision of their public and private information. Stock market reactions appear to be consistent with the implications induced by investor overconfidence behavior. ((Daniel, Hirshleifer & Subrahmanyan, 1998); (Chuang & Lee, 2006); (Deaves, Lüders, & Schröder, 2010); (Chou, & Wang, 2011); (Chen, Kim, Nofsinger & Rui, 2007); (Glaser, Langer & Weber, 2005) (DeBondt & Thaler, 1995); (Chuang & Lee, 2006); (Odean, 1999); (Barber & Odean, 2000, 2001, and 2002); (Griffin, Nardari & Stulz, 2007); (Griffin & Tversky, 1992).

Problem Statement

Kenya’s stock market has witnessed cases of stock market reactions as a result of extreme price volatility which point to the possibility of underlying inefficiencies which impacts on the shareholder value. Such market reactions are as a result of irrational behavior leading to market inefficiencies. Overconfident investor behavior in the stock market leads to stock prices to overreact or underreact. When noisy public information is received by investors, it results in inefficient deviation of stock price. Stock prices overreact to private information signals and underreact to public signals. The market’s tendency to over- or underreact to different types of information allows us to address the remarkable pattern that the average announcement date returns in virtually all event studies are of the same sign as the average post-event abnormal returns. An investor behavior model is needed to explain the observed pattern of returns that explains stock market reactions. The research will measure investor behaviour to determine predictability of abnormal returns in Kenya. This research will determine the effect of investor overconfidence behavior on stock market reactions in Kenya.

Research Objective

To determine the effect of investor overconfidence behavior on stock market reaction in Kenya.

Research Hypotheses

H0: Investor overconfidence behavior has no significant effect on stock market reactions in Kenya.

2. LITERATURE REVIEW

Theoretical Literature

This anomaly of human judgment was demonstrated in several experiments by psychologists. Kahneman and Tversky (1979) explained that there was no problem in
judgment and decision making which was more prevalent and more potentially catastrophic than overconfidence. Plous (1993) explains discrepancies between accuracy and confidence were not related to a decision maker's intelligence. Daniel, Hirshleifer and Subrahmanyam (1997) proposed a theory based on investor overconfidence and biased self- attribution to explain several of the securities returns patterns that seem anomalous from the perspective of efficient markets with rational investors. Daniel, Hirshleifer and Subrahmanyam (1998) explained the aspect of the theory is overconfidence about the precision of private information. Odean (1998) develops a theoretical model which considers of overconfidence by if market participants overestimated their ability to interpret information. Shefrin (2000) explains that overconfidence and anchoring appear to be part of the explanation underlying post-earnings-announcement drift and showed that overconfidence appeared to be a fundamental factor promoting the high volume of trade observed in speculative markets.

Barber and Odean (2001) compared trading activity and average returns in brokerage accounts of men and women. The authors found that men, in particular single men, trades far more actively than women, consistent with the greater overconfidence among men. People tend to overestimate the precision of their beliefs or forecasts, and they tended to overestimate their abilities. Such overconfidence might be responsible for the prevalence of active versus passive investment management itself an anomaly to adherents of the efficient market hypothesis. Statman, Thorley and Vorkink (2006) argue that investor overconfidence is a driver of the disposition effect because overconfidence encourages investors to trade asymmetrically between gains and losses. Daniel and Hirshleifer (2015) discussed the role of overconfidence as an explanation asset prices to displaying patterns of predictability that are difficult to reconcile with rational expectations-based theories of price formation. The finding indicates anomalies in financial markets are unprofitable due to the perspective of traditional purely rational models.

Empirical Literature

Jlassi, Naoui and Mansour (2013) findings showed that overconfidence still exists even during the recession period, but at different levels. Metwally and Darwish (2015) results are presented using the five lag selection criteria of the VAR model. It is found that that one criteria (Schwartz Criteria) is supporting the result at lag 2, while the other four criteria are all significant at lag Boussaidi (2013) results indicated that the overconfidence/overreaction hypothesis was confirmed only for one third of the firms composing our sample. The sum of the lagged coefficients associated to turnover is positive and significant.

Tariq and Ullah (2013) results indicated that return volatility has significant impact on returns but it hasn’t got any significant impact on turnover and previous days returns have significant positive impact on today’s turnover. Ko and Huang (2007) findings indicate that overconfidence generally improves market pricing provided the level of overconfidence is not too high. Statman, Thorley and Vorkink (2006) report that there is little difference in the trading patterns implications between the miscalibration version of overconfidence and the better than average one. Yeoh and Wood (2011) findings were that overconfident participants undertook smaller but more frequent trades. Adel and Mariem (2013) results achieved, through the application of tests and VAR modeling ARMA-EGARCH indicated the importance of confidence bias in the analysis of characteristics of the Tunisian financial market. Huisman, Sar and Zwinkels (2010) results indicated that the expected volatilities resulting from the Pearson-Tukey measure are even lower than those from the Parkinson (1980) measure. Results confirm that surveyed retail investors exhibit a significant overconfidence bias.

Daniel and Titman (1999) suggested that investor overconfidence can generate momentum in stock returns and that this momentum effect is likely to be strongest in those stocks whose valuations require the interpretation of ambiguous information. Grinblatt and Keloharju (2009) findings indicate that overconfident investors and those investors most prone to sensation seeking trade more frequently. Bias, Hilton, Mazurier and Pouget (2005) conducted univariate analysis using miscalibration and observation methodology. The empirical results show that miscalibration reduced and self-monitoring enhanced trading performance. The effect of the psychological variables was strong for men but non-existent for women. Barber and Odean (2001) document that men trade 45 percent more than women. Trading reduced men’s net returns by 2.65 percentage points a year as opposed to 1.72 percentage points for women. Durand, Newby, Tant and Trepongkaruna (2013) findings indicated that personality traits are associated with overconfidence and overreaction in financial markets. Scott, Stumpp and Xu (2003) results were consistent investor overconfidence behavior across different countries and trading environments. Zaiane and Abaoub (2009) based on the work of Statman, Thorley and Vorkink (2006) and by using VAR models and impulse response functions, the results indicate a little evidence of the overconfidence hypothesis when volume (shares traded) was used as proxy of trading volume.

3. RESEARCH METHODOLOGY

Quantitative research design therefore is useful in the study where cross-sectional and time series data analysis is required (Gujarati, 2003). The target population for this study comprises 67 listed companies in Kenya trading in equity stocks in the period 2004 to 2015 at the NSE. All the 67 listed companies were used as the population for this study in order to determine how the investor behavior has an effect of stock market reactions in Kenya. The sample for this study was 48 listed companies in Kenya from 2004 to 2016 because these were the companies that had traded for more than 3 years during this period of study. Sampling frame involves identifying samples from which to infer about the population. The dependent variable is the Stock Market Reactions and investor overconfidence behavior variable as the explanatory variables. NSE historical data on stock returns for the 13-year period 2004 to 2016.
Measurement of Study Variables

Stock Market Reactions

Stock market reaction was measured using abnormal returns. Excess return ARit are computed as the difference between the stock return and the market portfolio return to get market adjusted return. Market adjusted returns was measured as follows:

\[
AR_{it} = R_{it} - R_{m,t}
\]

Where:

- \(t\) is the monthly period,
- \(R_{m,t}\) is the equal-weighted return of the entire 20 share index.

Market return constant Rmt is subtracted from Rit. There is no risk adjustment except for movements of the market as a whole and the adjustment is identical for all stocks (De Bondt & Thaler, 1985); (Boussaidi, 2017).

Overconfidence

Investor overconfidence will be measured using trading volume and number of deals to ascertain turnover rate. Turnover rate will be used as a measure of volume of transactions and number of deals (Adel & Mariem, 2013). Excessive trading of shares on investor confidence contributes to excessive volatility (Adel & Mariem, 2013). Overconfidence is measured by turnover as follows:

<table>
<thead>
<tr>
<th>Method</th>
<th>Statistic</th>
<th>Prob.**</th>
<th>Cross-</th>
<th>Obs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levin, Lin &amp; Chu t*</td>
<td>-23.7412</td>
<td>0.0000</td>
<td>46</td>
<td>462</td>
</tr>
<tr>
<td>Breitung t-stat</td>
<td>-3.52203</td>
<td>0.0002</td>
<td>46</td>
<td>416</td>
</tr>
<tr>
<td>Im, Pesaran and Shin W-stat</td>
<td>-6.62687</td>
<td>0.0000</td>
<td>46</td>
<td>462</td>
</tr>
<tr>
<td>ADF - Fisher Chi-square</td>
<td>265.142</td>
<td>0.0000</td>
<td>46</td>
<td>462</td>
</tr>
<tr>
<td>PP - Fisher Chi-square</td>
<td>353.634</td>
<td>0.0000</td>
<td>46</td>
<td>476</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Method</th>
<th>Statistic</th>
<th>Prob.**</th>
<th>Cross-</th>
<th>Obs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levin, Lin &amp; Chu t*</td>
<td>-13.3815</td>
<td>0.0000</td>
<td>46</td>
<td>473</td>
</tr>
<tr>
<td>Breitung t-stat</td>
<td>-1.69881</td>
<td>0.0447</td>
<td>46</td>
<td>427</td>
</tr>
<tr>
<td>Im, Pesaran and Shin W-stat</td>
<td>-2.57013</td>
<td>0.0051</td>
<td>46</td>
<td>473</td>
</tr>
<tr>
<td>ADF - Fisher Chi-square</td>
<td>147.715</td>
<td>0.0002</td>
<td>46</td>
<td>473</td>
</tr>
<tr>
<td>PP - Fisher Chi-square</td>
<td>204.879</td>
<td>0.0000</td>
<td>46</td>
<td>476</td>
</tr>
</tbody>
</table>
The results from the unit root test for all the variables in Table 1 above shows that all the 48 cross sections of the investor overconfidence and stock market reaction variable were stationary. The first part of the table presents the common unit root test developed by Levin, Lin and Chu (2002). The test shows that considered simultaneously all the cross section are all stationary for the investor overconfidence variable. In other words, they do not have the unit root problem since the null hypothesis of unit root is rejected as depicted by the significant p-values of 0.0000.

The lower section presents yet another three tests of stationarity in panel data setting. These are Im, Pesaran and Shin (2003), ADF - Fisher Chi-square Maddala, and Wu (1999), PP - Fisher Chi-square (Choi, 2001). These tests assume the test of unit root on individual cross sections. As depicted by the p-values which are very statistically significant, the null hypothesis of non-stationarity was rejected. The interpretation is that the Investor overconfidence variable is stationary in the two cases of test. In conclusion, the test of stationarity is important because it helps to identify the order of integration of a variable and avoid spurious regression. In this case, the investor overconfidence and market Reactions variables are integrated of order zero (0).

Panel Dynamic Least Squares (DOLS)

Table 2 presents the results generated by employing the pooled estimation in the context of panel dynamic least square method. Kao and Chiang (2000), describes the pooled DOLS estimator in which ordinary least squares is used to estimate an augmented co-integrating regression equation. This co-integration technique was purely developed to handle variables that are co-integrated of the same order in economics. However, in this research, all the variables were found to be integrated of order zero but never the less they were subjected to the same technique to bring out the difference between this traditional technique and the modern one that was primarily employed in this paper as the primarily analytical tool. It assumes homogeneity in the data. It differs from the (DOLS) in that it employs lead and lags in the estimation process. These leads and lags help to eliminate any asymptotic endogeneity and serial correlation.

**Investor Overconfidence**

From the regression results in table 2 above the long run coefficient of investor overconfidence was found to be -0.26671. This value shows that holding other variables in the model constant, an increase in the investor overconfidence by one percent causes the market reaction to increase by a value of 0.26671 percent. The negative effect shows that there is an inverse relationship between investor overconfidence and market reaction.

The coefficient was also found to be statistically significant with a t-statistic value of -2.187990 and the p-value was found to be 0.0293. In econometrics and statistical analysis, a t-statistic of 1.96 and above is normally accepted to be the threshold for statistical significance. The interpretation was that in Kenya the investor overconfidence has a statistically significant effect on market reaction in the long-run horizon. This implies that increase in Investor overconfidence would cause an increase in market reaction. These findings are consistent with those of Metwally and Darwish (2015) where the investor overconfidence had a positive and statistically significant effect on stock market reaction. Tariq and Ullah (2013) were also consistent because they found a positive effect of investor overconfidence on stock market reaction hence consistent with the results in this study.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over confidence</td>
<td>-0.266471</td>
<td>0.121788</td>
<td>-2.187990</td>
<td>0.0293</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.202545</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.E. of regression</td>
<td>3.079774</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long-run variance</td>
<td>5.885651</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Turnover Rate = \[ \frac{n_{it}}{N_{it}} \]

Where:

n_{it} is the number of shares traded of stock i (volume traded per year);

N_{it} is the number of exchanges of stock i (number of deals per year); t is time; i is listed company.

4. RESULTS AND DISCUSSION

Table 2. Regression Results.

<table>
<thead>
<tr>
<th>Dependent Variable: Market Reactions; Method: Panel Dynamic Least Squares (DOLS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Periods included: 13; Cross-sections included: 48; Total panel (unbalanced); Panel method: Pooled estimation; Cointegrating equation deterministic: C; Fixed leads and lags specification (lead=0, lag=0); Coefficient covariance computed using default method; Long-run variance (Bartlett kernel, Newey-West fixed bandwidth) used for coefficient covariance</td>
</tr>
</tbody>
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<td></td>
</tr>
</tbody>
</table>

Mean dependent var

S.D. dependent var

Sum squared resid

Mean dependent var

S.D. dependent var

Sum squared resid

Fisher Chi-square

Prob.
5. CONCLUSION

The study concluded that in Kenyan stock market, investor overconfidence bias has a significant effect on stock market reaction. The study concludes that the investor overconfidence has a statistically significant effect on stock market reaction. This variable was significant in the primary model that used the pooled mean group as an estimator as well as the other two techniques that consider the pooling and the group aspect separately. This variable was statistically significant in all the five regressions that were ran to reveal the dynamics of the effect of the investor overconfidence on stock market reaction. This shows that investors are likely to purchase more stocks in the market when they are overconfident. Overconfidence therefore causes stock market reaction in Kenya. The investors and stock brokers should be keen on the investor overconfidence in the bias in the market. The investor bias could lead to stock prices moving from its fundamental values causing abnormal returns hence stock market reaction resulting from to variations in returns. In this research, it has been revealed that investor overconfidence has a significant effect on market reaction. It was noted that the investor overconfidence has significant effect on stock market reaction which meant that it leads to the fluctuation of abnormal returns in the market. Since the influence of investor overconfidence was supported by all the results from the different models to be statistically significant, it would be of help to the investors and stock brokers to consider this variable when tracking the prices of securities. CMA and the NSE should work to improve the modelling of stock prices to be able to reflect the information flow and factor in all behavioral factors that may be significant in influencing returns in the market. This will have the effect of increasing transparency and confidence in the market hence attracting more investors and cause more capital flows into the capital markets.

CONFLICT OF INTEREST STATEMENT

The authors declare that they have no conflict of interest.

REFERENCES


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