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The Relationship between Investor Behavior and Portfolio Performance at the Nairobi Securities Exchange

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Abstract
Extreme unpredicted momentum in global indices and security prices associated with uncertainty and unexplained stock price movements have made life difficult for a rational investor who relies on market fundamentals to make investment decisions. This study attempted to determine the contribution of investor behavior in influencing investor portfolio performance at the Nairobi Securities Exchange using a sample of 385 individual stock investors. The relationship between investor behavior and portfolio performance was tested using multiple regression. The overall model was statistically significant indicating that investor behavior influences portfolio performance with herding and disposition effect having a positive effect on portfolio performance while overconfidence has a negative effect on performance. The findings provide an eye-opener and basis of appreciation of the effect of behavioral biases on the results of trading activities. Stock market players can use these findings to understand the market dynamics and incorporate behavioral factors in analysing capital markets performance.

Keywords: Investor behavior, herding, overconfidence, disposition effect and portfolio performance

Introduction
The key tenet of modern portfolio theory is that if one wishes to increase the performance and reduce the risk in an overall investment portfolio, they should combine investments that are non-correlated with one another. The traditional theory of finance assumes that people are guided by reason and logic and therefore view investment decisions through the transparent and objective lens of risk and return. It argues that markets are efficient and therefore security prices are an unbiased estimate of their intrinsic value. Behavioral finance recognizes that emotions, herd instincts and social influences play an important role in influencing investment decisions leading to discrepancies between market price and fundamental value. Investor behavior looks at how behavior impacts investment decisions and how these decisions impact their portfolio performance. Overconfidence is a behavior where investors overestimate the accuracy of their forecasts due to an illusion of knowledge and of control future outcomes. Disposition effect refers to the behavior where investors are averse to risk and therefore tend to ride the losers as they are reluctant to realize losses treating unrealized paper loss and realized loss differently although from a rational economic point of view they are the same. Herding behavior is the tendency of investors to follow actions of others usually due to the fact that they rely on collective information more than private information which can result to price deviation of the securities from the fundamental value. The capital markets in Kenya have experienced unexplained volatility in the past where prices of stocks have moved in directions opposite to those expected from fundamentals with initial public offers attracting interest leading to under or excessive over subscription.

Research Objective
The research sought to determine the relationship between investor behavior and portfolio performance at the Nairobi Securities Exchange.

Literature review
People suffer from self-deception where they tend to think that they are better than they really are and hence they end up over simplifying complex situations due to heuristic driven biases. Such people suffer from overconfidence which makes them believe that they can obtain large returns, thus they trade often and they underestimate the associated risks. Barber and Odean (2000, 2001) and Odean (1999) find that individual investors who trade excessively,

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expose themselves to a high level of risk, and make poor ex post investing decisions. Odean (1999) finds that stocks that individuals sell outperform stocks that they buy. One form of heuristic simplification is mental accounting, where the mind keeps track of gains and losses related to decisions (Thaler, 1980). According to Jagadeesh and Titman (1993), mental accounting may explain the disposition effect where people want their good decisions to be recognized immediately in their mental accounts, but they postpone acknowledging their bad decisions.

Investors may sell stocks that have performed well so that they can feel good about themselves, or so they can boast to others about their ability to pick good stocks. At the same time, investors may hold on to their poorly performing stocks because they are not ready to acknowledge that they made a mistake and because they are afraid that the stocks may recover. Odean (1999) finds empirical support of disposition effect where individual investors are more unwilling to recognize their paper losses but are more than willing to recognize paper gains.

Kumar (2005) investigate the price trends of stocks bought by more than 62,000 households at a discount brokerage during a five-year period. They find that these stocks increased by 0.6% on average during the week before the purchase. The increase was 1.2%, 2.2%, and 7.3% for the two weeks, one month, and three months respectively before the purchase. The buying of past winners has also been identified by flows into equity mutual funds where investors like to buy past winners because they believe that the past price trend is representative of the future price trend.

Investors in emerging markets are less familiar with how equity markets work and they may therefore view investment in stocks as being very risky. According to Merton (1987) individual investors tend to hold only a few different common stocks in their portfolios. He posits that gathering information on stocks requires resources and suggests that investors conserve these resources by actively following only a few stocks. If investors behave this way, they will buy and sell only those stocks that they actively follow and reduce the chances of impulsively buying stocks that they do not follow thus supporting the herding behavior. Academic researchers pay their attention to herding because its impact on stock price changes can influence the attributes of risk and return models and this has impacts on the viewpoints of asset pricing theories. Herding can contribute to the evaluation of professional performance because low-ability professionals may mimic the behavior of their high-ability peers in order to develop their professional reputation. Herding investors act the same way as prehistoric men who had a little knowledge and information of the surrounding environment and gathered in groups to support each other and get safety (Brahmana et al., 2012).

Methodology
Population, Sample and Data
The population constituted all individual retail stock investors at the Nairobi Securities Exchange estimated 2.4 million retail investors based on Central Depository & Settlement Corporation limited investor data base as on December 31, 2014. The study covered the decisions made by the investors from January 1st, 2010 up to December 31st, the year 2014 on a sample of 385 individual active investors. The study relied on primary and secondary data collected from the 385 individual investors. The primary data on investor behavior was collected using a questionnaire that was administered to

investors while data on performance was extracted from investment statements provided by the investors. The 91-day Treasury bill rate was collected from the Central Bank of Kenya web site and from records in the CBK's research department where these were not available on the web site. The Central Bank of Kenya 91-day rate was used as a proxy for the risk free rate. Investor behavior was operationalized into overconfidence, herding and disposition effect while performance was measured using the Sharpe ratio.

Data Analysis
Unlike the other measures of performance, the Sharpe ratio does not assume that the returns of the portfolio must be well diversified. This study makes no assumption of the diversification of the individual investor's portfolio since the investors are assumed to suffer from behavioral biases hence the Sharpe ratio is appropriate as it does not assume that a portfolio should be well diversified and hence uses the standard deviation as a measure of risk.

The **Sharp ratio** was calculated as follows:
Number of shares x Price = The capitalization value which represents the Net asset value; denoted by **NAV.** This was determined at the beginning and at the end of each month over a period of five years. The beginning value was denoted by NAV_0 while the value at the end of the month was denoted by NAV_1. The returns for the period (month) were determined by comparing the net asset value of each investor at the beginning with that at the end of each month. Possible dividends paid during the month form part of the returns of the investor hence they were added to the numerator. The result is then divided by the beginning net asset value to determine the return for that period (month) as follows:

$$Period\ Returns\ (PR) = \frac{NAV_1 - NAV_0 + DIV}{NAV_0} \ldots\ldots\ldots\ldots (1)$$

Where
(PR) is the monthly return for the investor,
NAV_1 is the net asset value at the end of the month,
NAV_0 is the net asset value at the beginning of the month,
DIV represent dividends paid during the month,
The average returns ($\overline{PR}$) for each investor over the period of five years(60 months) were calculated by dividing the sum of the holding period (monthly) returns for each investor by the number of months (=60 months). The standard deviation of each investor was then calculated as follows

$$\sigma_i = \sqrt{\sum_{i=1}^{n} \frac{(PR - \overline{PR})^2}{n=60}} \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Sharpe Ratio was then computed using the average monthly returns of each investor, the standard deviation, and the risk free rate. The 91-day Treasury bill rate for the respective periods was taken as the risk free rate.

$$Sharpe\ Ratio\ for\ each\ investor = \frac{\overline{PR} - R_F}{\sigma_i} \ldots\ldots\ldots (3)$$

$\overline{PR}$ is the average monthly return for each investor,
R_F is the risk free rate as measured by the 91-T bill,
σ_i is standard deviation of the returns for each investor,
The relationship between investor behavior and portfolio performance was tested as follows:

$$Performance = \beta_0 + \beta_1 Herding + \beta_2 Disposition\ effect + \beta_3 Overconfidence + \alpha \ldots\ldots\ldots (4)$$

The following hypothesis was generated from the objective of the study.

Hypothesis 1(H1): There is a relationship between investor behavior and portfolio performance at the Nairobi Securities Exchange.

Multi-collinearity test showed that the variables were not correlated indicating their suitability for multiple regressions. The test of goodness of fit model of investor behavior subscales (herding, overconfidence and disposition effect) as predictor variables and portfolio performance as the dependent variable was carried out. Tests of the model overall significance was done using the F-test and model regression coefficients were tested for significance using the t-test.

Results and Discussions
The overall multiple regression model reveals a statistically significant relationship between portfolio performance and investor behavior with investor behavior explaining 6.6% of the variance in portfolio performance. The results also indicate that herding behavior and disposition effect have a positive and significant relationship with portfolio performance with β of 0.182 and 0.163 respectively. Overconfidence was also found to be a significant predictor of portfolio performance but the relationship was negative with a β of -0.134.

Hypothesis one (**H₁**) explored the relationship between portfolio performance and investor behavior at Nairobi Securities Exchange by suggesting that there is a relationship between investor behavior and portfolio performance at the Nairobi Securities Exchange. Results of this study indicate that the model has a predictive value and therefore we fail to reject the hypothesis (**H₁**) hence it can be concluded that investor behavior does influence the investor's portfolio performance.

The prediction equation can be written as follows:

Performance=-0.886+0.182Herding+0.163Disposition Effect--0.134Overconfidence+ε…………………. (5)

The findings show that overconfidence significantly and negatively affects performance and this can be explained by the fact that overconfidence leads to investors assuming a lot of risks thus making errors in their investment decisions which leads to poor returns. Herding investor behavior on the on the other hand leads to a positive effect on performance an indication that those who adopt a wait and see approach end up avoiding the mistakes that are made by their predecessors and therefore able to make better returns.

These findings are consistent with Gavriilidis (2013) who posits that investors make different types of cognitive errors that include predictable, non-optimal choices when faced with difficult and uncertain decisions because of heuristic simplification that force the brain to shortcut complex analyses. The findings also agree with those of Barber and Odean (2000, 2001) and Odean (1999) who posits that individual investors trade excessively, expose themselves to a high level of risk, and make poor ex post investing decisions. High risk taking is a key characteristic of overconfident investors who underestimate their risk and end up buying or selling securities that negatively affect their performance. Agrawal (2012) also noted that announcement returns were lower for overconfident bidders as compared to rational bidders thus supporting the findings of this study. The findings are also consistent with Alghalith et al (2012) who

found that individual investors were very prone to herding. Merton (1987) notes that individual investors tend to hold only a few different common stocks in their portfolios. He points out that gathering information on stocks requires resources and suggests that investors conserve these resources by actively following only a few stocks. This study did find herding to have a significant effect on portfolio performance.

6. Conclusions and Recommendations
The main purpose of this study was to determine the effect of investor behavior on portfolio performance at the Nairobi Securities Exchange. The study was based on the theory of behavioral finance which presupposes that individuals suffer from behavioral biases in making investment decisions rather than following the traditional finance theory that requires investors to be rational and to consider key fundamentals in making financial and investment decisions. The study has found that investor behavior does influence portfolio performance with herding and disposition effect having a positive effect on portfolio performance while overconfidence has a negative effect on performance. These indicate that those who herd and suffer from disposition effect make better returns than those who are overconfident. The implication here is that overconfidence leads to high risk taking due an illusion of knowledge or control causing investors to ignore fundamental information that affects their returns.

Herding and disposition effect give better returns since the herders follow the cue from others who have already taken the initial risk and are able to decide which cue to follow depending on the indicative performance. Disposition effect allows the investors to avoid regret hence they are unlikely to suffer from the negative consequences of high risk taking. Although herding has a positive effect on performance, it will also require a good cue to herd.

The investors can use these findings to understand how their behavior affects their portfolio performance and thus learn to avoid those behaviors that have a negative impact on the value of their investment. The capital markets in Kenya are drawing attention to potential investors both institutional and individuals as well as foreign and local investors. Companies going public can use the findings of this study to understand how investor behavior influence the price of securities and hence be able to set realistic prices that will attract the investors they target without distorting the market. Stockbrokers and mutual fund companies promise to maximize the wealth of investors who are their clients. More often than not they have failed to meet their end of the bargain as investors have ended up with disappointing returns since the stockbrokers and fund managers look at market fundamentals whereas the investors rely on behavioral biases thereby distorting the pricing system. The findings of this study can help stockbrokers and fund managers to understand investor behavior and advise the investors appropriately. The Capital Markets Authority (CMA), the Nairobi Securities Exchange and other market players can use these findings as a basis of investor education and minimization of noise trading in the Kenyan capital markets.

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