Effect of Over-Optimism Bias on Investments at the Rwanda Stock Exchange

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Abstract: **Behavioural biases have been identified to affect the investor's investment especially with the emergence of behavioural finance as an alternative to analysis of investor choice. It was therefore useful for investors to understand common emotional behaviours, from which they justify their reactions for better returns. The main objective of this study was to establish the effect of over-optimism biases on investment in the Rwanda Stock Exchange. The prospect theory, heuristics theory and herding theory formed the foundation of this study. The underlying epistemology of this research was positivist; focusing on examining earlier established theories under the assumption that reality is objectively given and can be described by measurable properties independent of the observer and the instruments. The study used cross-sectional descriptive survey research design to ascertain and establish the effect of over-optimism biases on investment in the Rwanda stock exchange. The target population comprised of 13,543 individual, group investors at the Rwanda Stock Exchange. Random sampling was used where the targeted population was individual investors to finally yield a sample size of 374 respondents. A questionnaire was used to collect the primary data. A pilot test was undertaken by carrying out a small scale trial run of the research instrument. Data analysis involved the use of descriptive and inferential statistics. A Linear regression model was used to predict the probability of different possibility outcomes of dependent variables, helping to predict the probability of an investor to invest in RSE. The results confirmed that there was a significant positive linear relationship between over-optimism bias, and Investment in Rwanda stock market. The study also concluded that most investors suffered from some of the behavioural biases in investment in stock markets. The study further recommends that the individual investors to seek the advice of stock brokers/fund managers to advise them accordingly in terms of performance of a specific security in which an investor would wish to invest in.**

Keywords: **Rwanda Stock Exchange (RSE), stock brokers/fund managers.**

1. INTRODUCTION

Background of the study:

Behavioural finance is the new field that seeks to combine behavioural (aspirations, cognition, emotions) and cognitive psychological theory. It explains why investors makes a rational financial decisions on the stock market (Lodhi, 2014). It describes the outcomes of interactions between investors and managers in financial and capital markets; and it prescribes more effective behaviour for investors and managers. The investment is mostly influenced in a large proportion by psychological and emotional factors (Sukanya & Thimmarayappa, 2015).

Investment is not an easy process, since the assumption is that investors always expect to maximize the returns although not all investors are so rational (Sukanya & Thimmarayappa, 2015). Traditional financial theories assume that investors are rational and risk averse, and hold diversified, optimal portfolios (Bhamra & Uppal., 2015). However, this doesn't work in reality since investors must consider the behavioural biases in investing as this can help the investors to avoid some unnecessary mistake made in investment in order to maximize the return and minimize the risk (Sukanya & Thimmarayappa, 2015; Bhamra & Uppal., 2015).

The traditional theory of finance assumes that people are guided by reason and logic and therefore view investment 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. Behavioural finance recognizes that emotions, herd instincts and social influences play an important role in influencing investment leading to discrepancies between market price and fundamental value. Investor behaviour looks at how behaviour impacts the investment performance (Nyamute, Lishenga & Oloko, 2015).

Pompian (2012) found that, behavioural biases refer to the tendency of decision making that result in irrational financial decisions caused by faulty cognitive reasoning and /or reasoning influenced by emotions. The interest in biases caused by faulty cognitive reasoning or emotions that affect individual financial outcomes has seen the emergence of research on behavioural finance as a concept.According to Shefrin (2007) bias is nothing else yet the inclination towards failure. Bias is tendency to make decisions while the decision maker is already being subjected to an underlying credence or belief. There are so many biases in human psychology (Shefrin, 2010). These biases lay impact on individuals in such a way that they frequently deed on an obviously silly way, routinely disregard conventional ideas of risk aversion, and make foreseeable lapses in their conjectures and judgments (Sewell, 2007).

These biases play their part in shaping individual's choices, financial decisions in corporations and financial markets. Unreasonable choices hamper the investor's wealth and the execution of companies and additionally the productivity of business sector. Scholars have identified so many biases (Kafayat, 2014). Kahnemann and Tversky, (1979) wrote a paper in which they stated different states of mental biases that may impact the investment process; they are risk aversion, regret aversion and self-attribution and the locus of control (Barberis & Thaler, 2003).

According to Lam (2004) the investors' predictions of the market fluctuations with certain methods, may be technical or fundamental analysis used to predict money market. Technical analysis is used in forecasting stock price fluctuations while fundamental analysis attempts at differentiating the investment approach (Ince & Trafalis, 2007).

Some of the common mistakes made by investors in designing their investment are identified as follows: investors fail to design their investment avenues systematically; investors fail to diversify their investment choice (Sukanya & Thimmarayappa, 2015); investors generally overestimate their skills, attributing success to ability they don't possess and seeing order in information or data where it doesn't exist i.e., investors are overconfident while making investment; investors blindly follow the crowd (herd mentality) while making investment which leads to wrong investment; investors anchor on historical information; investors think that good times are permanent (Nofsinger, 2016). They feel that ones they earn a good profit from their investment avenue ,the investment would give them good returns permanently; investors are greed and they want to earn money quickly (instant gratification) which also leads to wrong investment. Finally, investor's generally make short term investments rather than long term investments (Shefrin, 2002).

Behavioural motivations have been advocated as a main driving force in investment choice globally. Nielsen & Riddle (2009) shows that irrational behaviours among investors do exist and collectively this irrationality can affect the movement of the stock market. According to Kumar & Goyal, (2015), markets and market agents are efficient and systematic. Investors have to choose a course of action among various alternatives in the world of uncertainty.

The Rwanda Stock Exchange (RSE) started in January 2011, replacing Over the Counter Exchange in existence from 2008, with only Bralirwa stock, a brewery manufacturing firm trading (Mwangi, 2016). Rwanda's Stocks Exchange is young compared to the other markets in EAC, like Nairobi Security Exchange (NSE) which was established in 1954, Dares Salaam Security Exchange in 1996 and Uganda Stock Exchange in 1997. Currently RSE has only three Initial Public Offering (IPO), Bralirwa, Bank of Kigali and Crystal Ventures as primarily listed in Rwanda and four IPO as secondarily listed in Rwanda includes: Kenya Commercial Bank Group and Nation Media Group, which are primarily listed in Nairobi Stock Exchange and cross listed on the Rwanda Stock Exchange (Kidd, 2012). Others include; Uchumi Supermarkets and Equity Group Holdings. The RSE operates in close association with the Nairobi Stock Exchange in Kenya, the Dares Salaam Stock Exchange in Tanzania and the Uganda Securities Exchange in Uganda since regional integration is only one aspect of the financial policy agenda for Africa (ADB, 2012).

However, the Rwanda stocks exchange has largely attracted the large investors (group or organizations), institutional investors and a few individual investors (Kumar & Goyal, 2015). The influence of behavioural biases especially emotional ones will be analysed in an attempt to decipher their effect on investment in the Rwanda stock exchange in terms of whether they affect the investment.

Statement of the Problem:

The government of Rwanda has a goal to develop the economy by 2020 therefore it has to encourage participation and growth of the stock market, thereby facilitating the growth, flow, and regulation of the stock market (Mauwa, 2016). The government has ensured that investors in the Rwanda Stocks Exchange are protected, by advising and guiding companies seeking investment through provision of important infrastructures and conducive environment for business development (Mauwa, 2016).

Despite these efforts, investment in the Rwanda stock exchange is low and the Rwanda Stocks Exchange is not growing at the pace expected. Currently there are approximately 13,543 registered investors, all these investors are composed by the individual investors, group investors and institutional investors. The market capitalization of Rwanda Stocks Exchange is USD 3.7 billon with 7 listed companies (RSE, 2015). In comparison with Nairobi Securities Exchange, there are approximately 66 listed companies with a total market capitalization of approximately USD 23 billion (Mwangi, 2016).

Few studies have been conducted to establish the effect of behavioural biases on investment in the Rwanda Stock Exchange. Mwangi (2016) studied on the effect of financial structure and financial performance of listed firms at the East Africa Securities Exchanges. Specifically, the study evaluated the effect of short term debt, long term debt, retained earnings and other shareholders funds on financial performance. Mauwa (2016) b sought to appraise the effect of capital structure on financial performance of firms listed on Rwanda Stocks Exchange. The variable studied was capital structure. Studies on the effect of behavioural biases on investment have been conducted but outside Rwanda.

Nyamute, Lishenga and Oloko (2015) attempted to determine the contribution of investor behaviour in influencing investor investment performance at the Nairobi Securities Exchange. The variables studied were herding, disposition effect and overconfidence. This study was conducted in Kenya. Luong and Ha (2011) studied the behavioural factors influencing individual investors' decisions at the Ho Chi Minh Stock Exchange. The variables studied were herding, market, prospect, overconfidence-gamble's fallacy, and anchoring-ability bias. No study on effects behavioural biases on investment in Rwanda Stock Exchange has been undertaken specifically combining self-serving bias, over-optimism, loss aversion, self-attribution and confirmatory bias as the explanatory variables. This study attempted to fill this gap by analysing behavioural financial biases and their effects on investment in the Rwanda Stock Exchange.

General objective:

The main objective of the study was to establish the effect of over-optimism bias on investment in the Rwanda stock exchange.

Research Hypothesis:

$H0_1$: Over-optimism bias has no significant effect on investment in the Rwandan Stock Exchange.

Scope of the Study:

This study focused on the individual and institutional investors registered at RSE over the period of 2010 to 2015. The study also focused on examination of the effects of over-optimism bias on the investment in the individual and institutional investors. Econometric analysis was used to analyse the behavioural biases in investment and what pushes the investors to invest in stock market. The study further provided some guidelines that may be learned by Rwanda Stock Exchange and attempt to come-up with some strategies to develop the industry and strength the regulatory framework.

2. LITERATURE REVIEW

Theoretical Review:

This research adopted The herding behaviour theory, prospect theory and heuristics theory to discuss the importance of emotional behavioural of investors on investment.

Empirical Literature:

Though the literatures of behavioural finance are very large, some of the empirical cases of behavioural finance, which are based on the psychology, attempt to understand how behavioural biases and cognitive errors influence individual investors' behaviours (Chaudhary, 2013). Kumar & Goyal (2015) argues that the emotions biases affect the investment. The behavioural finance extends this analysis to the role of biases on the investment in the stock market. This type of biases has effect to almost all the decisions made by investors especially related to investment. This study will focus on over-optimism bias.

Over-Optimism Bias:

Kungu (2016) conducted a study on the effect of cognitive biases on individual investment decisions at the Nairobi Securities Exchange. This study sought to establish the cognitive biases which influence individual investment decisions at the Nairobi securities exchange. Descriptive research design was used. A sample of 69 individual investors was used. Primary data was collected using self-administered questionnaires. It was analyzed using SPSS Version 22 to generate frequencies, mean scores, percentages, and multiple regression analysis. Major findings indicated that results of individual investment decisions were significantly correlated to a number of cognitive biases including; random walk anchoring excessive optimism and accounting information. The study concluded that cognitive biases play a significant role in individual investment decisions.

Malmendier and Tate (2008) in a study on CEO over-confidence and the market reactions found that CEOs who are optimistic regarding their organizations future performance have a greater sensitivity to investment, leading to distortions in investments. The authors further found that the optimistic CEOs are 65 percent more likely to complete mergers, are more likely to overpay for those target companies, and are more likely to undertake value-destroying mergers. Finally, optimism-bias is inconsistent with the independence of decision weights and pay-offs found in models of choice under risk, such as expected utility theory and prospect theory.

Prosad (2014) studied on impact of investors' behavioural biases on the Indian Equity market and implications on stock selection decisions. The study found that over-optimism has direct applications in investment, which can be complex and involve forecasts of the future. In addition, over-optimism investors may overestimate their ability to identify winning investments. Traditional financial theory suggests holding diversified portfolios so that risk is not concentrated in any particular area. 'misguided conviction' can weigh against this advice, with investors or their advisers 'sure' of the good prospects of a given investment, causing them to believe that diversification is therefore unnecessary. Finally, one variety of over-optimism is a belief that one knows more than one actually does, which is sometimes labelled "over precision." on the investment which is measured by investment return rate and trading experience.

Qadri and Shabbir (2014) studied the impact of two biases, overconfidence and illusion of control, on the investor's decisions on the Islamabad stock exchange. Researchers used questionnaire for data collection. The study found that over confidence and illusion of control bias has a lot of impact on investors' decision in ISE. The study also showed that Male are more overconfident than female and Investors do not focus much on fundamental or technical analysis while taking their decisions.

Research Gaps:

Although there are many reviewed studies contributing to the development of behavioural biases on of investors investment, majority of these studies have focused on the developed world (Baddeley *et al*., 2012). Majority of behavioural finance literature analyses individual investors in developed markets such as USA, UK and Western Europe. As Rwanda is an emerging market and there exists cultural differences compared to USA, UK and Western Europe, it is worth analysing Rwandese investors in terms of investment behavioural biases they exhibit.

Furthermore, many of the research in behavioural finance literature depend on data that is generally limited to the subsamples of overall investor groups in these countries. Many researchers have pointed out that the behavioural biases has a certain influence on the investment (Gomes, 2005; Baddeley *et al*., 2012). However, as stated, there are few studies about investments d in the developing world like Rwanda. Studies such as Sukanya and Thimmarayappa (2015) focussing on impact of behavioural biases in investment process in Sri Lanka have different findings pointing to the fact that affluent investors reported that their own stock-picking skills were critical to the investment performance. This study will be different as the focus will be on the relationship between over-optimism bias, and investment among investors.

3. METHODOLOGY

The underlying epistemology of this research was positivist; focusing on examining earlier established theories under the assumption that reality is objectively given and can be described by measurable properties independent of the observer and the instruments. The study used cross-sectional descriptive survey research design to assess and establish the effect of behavioural biases on investment at the Rwanda stock exchange. The design was suitable for the proposed study because it attempted to determine current status of the phenomenon. The cross-sectional descriptive survey method was suitable for this study since data was collected at one particular time (Silverman, 2013) across the respondents in the Rwanda Stock Exchange.

The target population of this study comprised of individual, group and institutional investors at the Rwanda Stock Exchange which are approximately 13,543 RSE, 2015. There are approximately 10,662 local investors, 2,474 from EAC and 407 registered as foreigner investors, all these investors are composed by the individual investors, group investors and institutional investors (Directory, Rwanda Stocks Exchange, 2015). The sampling frame comprised of a list of 13,543 individual investors which was sought from the Rwanda Stock Exchange. Stratified random sampling was first be used where the targeted population was stratified into three distinct strata Rwandese investors, EAC and foreign investors. According to RSE (2015) there are 13,543 investors registered at the RSE, 10,662 Rwandese investors, 2,474 EAC and 407 foreign investors at the Rwanda Stock Exchange that means 79% of domestic, 18% EAC and 3% foreign investors RSE, 2015. Corresponding samples were drawn from each sample. Stratified random sampling was used and it involved dividing the population into homogeneous subgroups followed by a simple random sample (Kombo & Tromp, 2006).

To determine the sample size for this study in consideration of the population of 13,543 investors the study used the normal approximation to the hyper-geometric distribution. The sample size formula for small (hyper-geometric) populations is shown as follows:

$$n = \frac{NZ^2 pq}{\{E^2(N-1) + Z^2 pq\}}$$ …..…………………………Equation (1) Morris, 2014)

Where; n= is the required sample size

N= is the population size (13,543)

Z= is the level of confidence of the sample size (set at 95%) thus Z=1.96

P and q are the population proportions (Each set to 0.5).

E sets the accuracy of the sample proportions (set to 0.05).

Therefore;

$$\frac{13543 \times 1.96^2 \times 0.5 \times 0.5}{0.05^2 (13543-1) + 1.96^2 \times 0.5 \times 0.5}$$

n = 13006.6972 ÷ 34.8154

Hence, 374 was the suitable sample size for the population of 13543 investors from Rwanda Stock Exchange. The sample size is 374, were selected using the simple random sampling.

The study collected primary data. A semi-structured questionnaire was used to collect the primary data. The semi-structured questionnaire was designed to contain both closed and open-ended questions and a five-point Likert scale. The questionnaire was divided into three parts: (a) demographic information (b) investment (c-g) information on biases.

Descriptive statistics such as mean, standard deviation and the inferential techniques such as regression and correlation were used as well. Data was also analyzed and expressed in terms of charts and tables for quick references. In relation to inferential statistics, the linear and multi linear regression models were utilized to further give inferences to the data obtained using the Statistical Package for Social Sciences (SPSS).

Following the study, the linear regression models were used to test the significance of the overall model at 95% level of significance. Coefficient of correlation (R) was used to determine the strength of the relationship between the independent variable (over-optimism bias) and the dependent variable which is investment in stock exchange. Coefficient of determination (R^2) was also used to show the percentage for which independent variable explained the change in the dependent variable.

$Y = \beta_0 + \beta_1 X_1 + \varepsilon$

Where:

Y= Investment in Rwanda stock Exchange

β_0= Constant

β_1...........β_4=Represents the regression coefficients

X_1= Over-optimism bias

ε = Represents the error term

4. RESEARCH FINDINGS AND DISCUSSION

Descriptive Results of the Study Variable:

This section provides descriptive results on how respondents responded to the statement in the questionnaire. This section presents the findings of descriptive statistics based on the research objectives.

Over Optimism Bias:

The main objective of the study was to examine the effect of over-optimism bias on investment in the Rwandan stock market. The findings in Table 4.1 present the descriptive results on the effect of over optimism bias on investment in the Rwandan stock market.

Table 4.1 Descriptive Results on Over Optimism Bias

	SD	D	NS	A	SA	Mean	Std Dev
Increasing trade volumes persist over a long time	19.4%	20.3%	21.7%	21.1%	17.4%	2.97	1.38
Increasing price volumes persist over a long time	22.3%	19.4%	25.1%	14.9%	18.3%	2.87	1.40
It is always easy to dispose of shares when in need	23.1%	28.3%	14.9%	18.3%	15.4%	2.75	1.40
My investment mostly promise high capital gain	16.9%	23.7%	23.1%	20.9%	15.4%	2.94	1.32
Economic recession persist over very short time periods	19.1%	21.4%	23.7%	21.1%	14.6%	2.91	1.33
Economic boom persist over long periods of time	14.0%	25.4%	22.9%	21.1%	16.6%	3.01	1.30
Government economic policy is mostly helpful in boosting Rwanda Stock Exchange	18.0%	21.1%	19.1%	18.0%	23.7%	3.08	1.43
Companies at Rwanda Stock Exchange are often more profitable than not	17.7%	24.3%	19.7%	24.0%	14.3%	2.93	1.33
The trade omission is so minimal on the level that does not affect my trades	18.6%	20.6%	24.0%	20.3%	16.6%	2.96	1.35
Regulatory actions often yield positive performance at Rwanda Stock Exchange	17.1%	19.7%	27.1%	17.4%	18.6%	3.01	1.34

The study sought to establish whether increasing trade volumes persisted over a long time, the results showed that 21.1% and 17.4% agreed and strongly agreed, while 20.3% and 19.4% strongly disagreed and disagreed. The statement had a mean of 2.97 and standard deviation of 1.38 which confirmed that the respondents had varying opinions on this statement. The findings further showed that 22.3% and 19.4% of the respondents strongly disagreed and disagreed that increasing price volumes persisted over a long time while 14.9% and 18.3% agreed and strongly agreed with the statement.

On whether it was always easy to dispose of shares when in need, 28.3% and 23.1% of the respondents disagreed and strongly disagreed. Those who agreed and strongly agreed were 18.3% and 15.4% respectively. The statement had a mean of 2.75 which further showed that respondents were of the varying opinion. The study further sought to establish whether respondent's investment mostly promised high capital gain, the findings showed that 20.9% and 15.4% strongly agreed and agreed while on the other hand, 23.7% and 16.9% of the respondents strongly disagreed and disagreed respectively.

The study further sought to establish whether economic recession persisted over very short time periods, the results revealed that 21.4% and 19.1% disagreed and strongly disagreed respectively. The statement had a mean of 2.91 confirming the respondents had a varying opinion as far this statement was concerned. The study was further interested in whether government economic policy was mostly helpful in boosting Rwanda Stock Exchange. The finding showed that 18.0% and 23.7% of the respondents agreed and strongly agreed with the statement while 21.1% and 18.0% disagreed and strongly disagreed with the statement. The statement had a mean response of 3.08 and standard deviation of 1.43 which

further confirmed that divided opinion among the respondents and a wide variation in the responses as shown by the standard deviation.

The study further intended to establish whether companies at Rwanda Stock Exchange are often more profitable than not, from the findings 24.3% and 17.7% of the respondents disagreed and strongly disagreed respectively while 24.0% and 14.3% agreed and strongly agreed. The statement had a mean response of 2.93 meaning that those who agreed and those who disagreed were almost in equal proportions. The finding also showed that 20.6% and 18.6% disagreed and strongly disagreed respectively that the trade omission is so minimal on the level that does not affect my trades. Those who agreed and strongly agreed were 20.3% and 16.6% respectively.

Finally, the study sought to establish whether regulatory actions often yielded positive performance at Rwanda Stock Exchange, the findings showed that 19.7% and 17.1% disagreed and strongly disagreed with the statement while 18.6% and 17.4% agreed and strongly agreed respectively. The statement had a mean of 3.01 meaning that those who agreed and those who disagreed were almost in equal proportions while the standard deviation confirmed that the response were varied across the respondents.

The findings of this study implied that we had both investors that suffered from over optimism and those that never relied on over optimism when investing at the Rwanda stock markets. Investors who rely mainly on analytics don't suffer over optimism as those that don't rely on analytics. The finding of this study concurs with Shefrin (2007) who argued that decision makers' preferences tend to be multifaceted, open to change, and often formed only during the decision process itself. Decision makers appear to be adaptive, in the sense that the nature of the decision and the environment in which the decision is made contribute to their selection of a decision process or technique.

Similarly, Baker, Ruback & Wurgler (2005), also found that 68 percent of start-up entrepreneurs believe their company is more likely to succeed than similar companies, while in reality only 50 percent of start-up companies survive beyond three years of activity. Daniel, Hirshleifer & Subrahmanyam (1998) also found that over-optimism bias manifests when investors place too much weight on information they collect themselves due to excessive optimism.

Inferential Statistics Results:

Univariate Regression Analysis:

The study employed a linear regression analysis to test the relationship between independent variable and the dependent variable. According to Kothari (2014), regression is the determination of a statistical relationship between two or more variables. In simple regression, there are two variables, one variable (defined as independent) is the cause of the behavior of another one (defined as dependent variable).

Univariate Regression Results for Over Optimism Bias and Investment in RSM:

The objective of the study was to test the relationship between over optimism bias and investment in Rwanda stock market. The findings of univariate regression are presents in Table 4.15. The findings are presented in Table 2 and table 3. Table 2 contain the regression on the relationship between Over Optimism Bias sub constructs and investment in RSM while table 3 in the univariate regression analysis on the effect of Over Optimism Bias on investment in RSM.

Table 4.2 Regression Results for Over Optimism Bias Sub constructs

	B	Std. Error	t	Sig.
(Constant)	3.02	0.05	60.382	0.000
Overestimate tendency	0.079	0.022	3.622	0.000
Underestimate tendency	0.162	0.022	7.499	0.000
R				0.642
R Squared				0.412
Adjusted R Squared				0.409
F statistic (p value)				121.587 (0.000)

The study conducted a regression analysis to test the effect of Over Optimism Bias subcontracts which included overestimate tendency and overestimate tendency on investment in Rwanda stock exchange. The finding showed that model had R-squared of 0.412 which indicated that 41.2% of the variation in investments in Rwanda stock market can be accounted for by overestimate tendency and overestimate tendency. The model also yielded F-statistics =121.587 with a corresponding p-value = 0.000 which was less than 0.05, meaning that there is a relationship between overestimate tendency and overestimate tendency and Investment in Rwanda stock market.

Investment in Rwanda Stock Market = **3.02** + **0.079** (**Overestimate Tendency**) + **0.162** (**Underestimate Tendency**) + ε

The regression coefficient of overestimate tendency was (β=0.079, p=0.000, <0.05) shows that the effect of overestimate tendency on investment in the Rwandan Stock Exchange was statistically significant relationship. The finding implied that a unit increase in overestimate tendency would results to an increase of 0.079 units in investment in the Rwandan Stock Exchange.

The results further showed that regression coefficient of Underestimate Tendency was (β=0.162, p=0.000, <0.05) indicating that Underestimate Tendency had a positive and significant effect on investment in the Rwandan Stock Exchange. The finding implied that a unit increase in underestimate tendency would results to an increase of 0.162 units in investment in the Rwandan Stock Exchange. The finding concurs with those of Daniel, Hirshleifer and Subrahmanyam (1990) who also found that over-optimism bias causes investors to trade excessively and causes them to believe that they are less at risk of experiencing a negative event compared to others.

Table 4.3 Regression Results for Over Optimism Bias and Investment in RSM

	Model 2
Parameters	**Dependent Variable: Investment RSM**
Constant (**p value**)	3.136 (**0.000**)
Over Optimism Bias (**p value**)	0.181 (**0.000**)
R	0.413
R Squared	0.17
Adjusted R Squared	0.168
F statistic (**p value**)	71.424 (**0.000**)

The results showed a relationship R= 0.413, indicating a strong positive association between over optimism bias and investment in Rwanda stock market. R-squared= 0.17 indicated that 17.0% of variation in the investment in Rwanda stock market can be explained by over optimism bias while the remaining percentage is explained by other variables not in the model. The results of ANOVA test show that the F value is 71.424 with a significance of p value = 0.000 which was less than 0.05, meaning that there is a relationship between over optimism bias and investment in Rwanda stock market.

The model $Y = \beta_0 + \beta_1 X_1 + \varepsilon$ therefore became **Investment in Rwanda stock market = 3.136 +0.181 (over optimism bias) +ε.**

The results on the beta coefficient of the resulting model showed that the constant α = 3.136 is significantly different from 0, since the p- value = 0.000 is less than 0.05. The coefficient β = 0.181 is also significantly different from 0 with a p-value=0.000 which is less than 0.05. The results imply that change in over optimism bias will result in 0.181 units change in Investment in Rwanda stock market. This confirms that there is a significant positive linear relationship between over optimism bias and Investment in Rwanda stock market.

These finding supports those of Prosad (2014) whose study found that over-optimism has direct applications in investment. Daniel, Hirshleifer and Subrahmanyam (1990) also found that over-optimism bias causes investors to trade excessively and causes them to believe that they are less at risk of experiencing a negative event compared to others.

However, the findings contradicts those of Baker, Ruback and Wurgler (2005),whose study found that 68 percent of start-up entrepreneurs believe their company is more likely to succeed than similar companies, while in reality only 50 percent of start-up companies survive beyond three years of activity. Similarly, the finding contradicts those of Malmendier and Tate (2008) in a study on CEO over-confidence and the market reactions found that CEOs who are optimistic regarding their organizations future performance have a greater sensitivity to investment, leading to distortions in investments.

5.   SUMMARY, CONCLUSION AND RECOMMENDATIONS

Summary of Findings:

The objective of the study was to examine the effect of over-optimism bias on investment in the Rwandan stock market. The correlation coefficient was found to be significant and positive implying that as over optimism bias increases the investment in Rwanda Stock Market also increases. The results of univariate regression analysis showed indicated that a significant variation in the investment in Rwanda stock market can be explained by over optimism bias.

This confirmed that there was a significant positive linear relationship between over optimism bias and Investment in Rwanda stock market. The coefficient of over-optimism bias in the multivariate regression analysis revealed a statistically significant relationship between over-optimism bias and investment in the Rwandan Stock Exchange. Hence the study rejected the null hypothesis and concluded that over-optimism bias has a significant effect on investment in the Rwandan Stock Exchange.

Conclusion:

This study established that over optimism bias, significantly affected investment in Based on the findings, the study also concluded that over optimism bias affects the financial decision making of many investors at the stock markets. Over-optimism bias occurs majorly when investors place too much weight on past information.

Based on the findings, the study further concluded that investors at the stock market tend to be more regretful about holding losing stocks too long than selling winning ones too soon. This is because to many stock market investors failure depresses them.

Recommendations of the Study:

This study found out that over optimism bias, significantly affected investment in Rwanda stock market. Based on these findings the following recommendations were made;

The study recommended that in order to manage the excesses of over optimism bias influences to stock market investment frequency, training programs that create investor awareness and ability to identify and guard against such biases that lead to bad investment choices should be offered to both potential and existing individual investors.

The study further recommends that the individual investors to seek the advice of stock brokers/fund managers to advise them accordingly in terms of performance of a specific security in which an investor would wish to invest in. The implication is that such brokers/fund managers have the information of the market and are aware of the movers and shakers of securities and therefore provide their advice at a fee.

Suggestions for Further Research:

These results indicated that there is a large over 50% of variation in the investment in Rwanda stock market can be explained by over optimism bias. Therefore, future studies should focus on others factors not included in this study that account for the remaining percentage.

The study further suggested that future studies should focus on behavioural biases on investment at other mature stock market for comparison purposes. This is because Rwanda is one of the youngest stock market in East Africa with a small number of listed companies and low market capitalization, an indicator of low Stock Market development.

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