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Effect of Behavioral Finance on the Participation of Investors in the Stock Exchange Market, in Rwanda

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Abstract: ***The purpose of this study was to investigate the Effect of behavioral finance on the participation of investors in the stock exchange market in Rwanda. A survey was conducted on 376 respondents obtained through stratified random sampling technique from 18,764 individuals and group investors in the Rwanda Stock Exchange market. Data was gathered by means of structured self-administered questionnaires and analyzed using regression analysis and descriptive statistics. The results of analysis show that the coefficient R is .780 implying that a strong, positive and linear relationship exists between behavioral finance and stock market participation, further the coefficient for R –squared -.608 suggests that approximately 61 of the variations in the stock market participation can be explained by behavioral finance. Moreover, the P-value obtained (0.000) lower than 0.05 level of confidence confirming that the relationship between behavioral finance and stock market participation is statistically significant. In terms of constructs overconfidence was rated highly with mean score of 4.11, followed by Loss aversion 4.02, constructing portfolio 3.85, while Biases was rated the least important with mean of score of 3.74. In view of the results the study concludes that behavioral finance in terms of the fore stated constructs plays a key role in influencing investors and other key players in the stock exchange market, Rwanda. Thus, the study recommends for development of innovative financial approaches that would encourage more investors in to the stock market exchange.***

Keywords: Investor; Behavioral finance; Stock market; Stock exchange

1. Background of Behavioral Finance

Behavioral finance studies the psychology of financial decision-making. Most people know that emotions affect investment decisions. People in the industry commonly talk about the role greed and fear play in driving stock markets. Behavioral finance extends this analysis to the role of biases in decision making, such as the use of simple rules of thumb for making complex investment decisions. In other words, behavioral finance takes the insights of psychological research and applies them to financial decision making, (Alistair B. & Stephen P. Utkus, 2013).

Behavioral Finance attempted to explain the market magnitude of the psychological market choices and additionally elevated financial decision making by the application of economic and psychological principles. Behavioral Finance rested on two fundamental blocks namely: limits to arbitrage and psychology (Miguel H. 2012). Arbitrage possibilities created through irrational noise investors may additionally be tough to correct by using rational counterparts due to a variety of constraints like cost, risk, etc. Therefore, there existed boundaries to arbitrage. Behavioral economists used psychology to know how investors have been susceptible to biases which was because of the beliefs and preferences of investors (Miguel H. 2012).

Behavioral finance offers an alternative foundation block for each of the foundation blocks of standard finance. According to behavioral finance: People are normal, Markets are not efficient, even if they are difficult to beat, People design portfolios by the rules of behavioral portfolio theory and Expected returns of investments are described by behavioral asset pricing theory, where differences in expected returns are determined by more than differences in risk (Meir S. 2104).

Galanidis (2016), used data for five different capital markets (in Portugal, Italy, Ireland, Greece, and Spain) over the period from January 01, 2010 to December 31, 2015 to investigate the presence of behavioral finance phenomena and concluded that investor's decision-making process is influenced by both psychological and emotional factors, however, the sociological facet speaks to the fact that several financial decisions result from social interaction.

In Malaysia, Jasman T. & Zamri A. (2016), found that behavioral biases have also been highlighted in market level studies. First, overreaction, under reaction, and overconfidence biases due to various events like attention to winners and losers stocks, market rumors, and speculative political issues.

In Kenya, Maina (2016) determined the existence of herding behavior among institutional investors and its effect on stock market performance by using the volume of shares traded and value of shares traded as proxies for investor herding.

Rwanda Stock Exchange Limited was incorporated on 7th October 2005 with the objective of carrying out stock market operations. The Stock Exchange was demutualized from the start as it was registered as a company limited by shares. The company was officially launched on 31st January, 2011, replacing Over the Counter Exchange in existence from 2008, with solely Bralirwa stock, a brewery manufacturing company buying and selling (Mwangi, 2016).

In contrast to the different 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, Rwanda's Stocks Exchange is younger. At present RSE has solely three Initial Public Offering (IPO), Bralirwa, Bank of Kigali and Crystal Ventures as especially listed in Rwanda and four IPO as secondarily

listed in Rwanda includes: Kenya Commercial Bank Group and Nation Media Group, which are in particular listed in Nairobi Stock Exchange and pass listed on the Rwanda Stock Exchange (Kidd, 2012). Others include; Uchumi Supermarkets and Equity Group Holdings. According to (ADB, 2012). The RSE has close operations with the Nairobi Stock Exchange in Kenya, the Dares Salaam Stock Exchange in Tanzania and the Uganda Securities Exchange in Uganda due to the regional integration.

The mission of Rwanda Stock Exchange (RSE) being to provide the main platform for promotion of savings and raising funds for long term investments in Rwanda and beyond, it needs to influence high participation level of investors. It is in this aim that it conducted various activities as follows: Public education and investment awareness campaigns; Conferences and workshop; Capacity building; Corporate social responsibility (CSR), RSE 2018.

2. Statement of the Problem

Few studies have been conducted to establish the effect of behavioral finance on stock market participation in 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 behavioral biases on investment have been conducted but outside Rwanda. Niyoyita M. J. (2017) conducted the study on Effect of Over-Optimism Bias on Investments at the Rwanda Stock Exchange.

3. Theories and Literature

Behavioral finance captures the role of behavioral biases in investor decision making. Shefrin (2000) broadly classifies these biases into two types: heuristic driven biases and frame dependent biases.

- **Heuristic driven biases:** Shefrin (2000) recognizes that financial practitioners use rules of thumb or heuristics to process data and make decisions. For instance, people believe that future performance of the stock can be best predicted by past performance. The author categorizes such biases under heuristic theme which includes over-confidence, anchoring and adjustment, reinforcement learning, excessive optimism and pessimism.
- **Frame dependent biases:** The decision process of financial practitioners is also influenced by the way they frame their options. This theme includes biases like narrow framing, mental accounting and the disposition effect.

Behavioral biases are also categorized by Pompian (2011) into cognitive and emotional biases. The *cognitive* biases include overconfidence, representativeness, anchoring and adjustment, framing, cognitive dissonance, availability, mental accounting, etc. The *emotional* biases include endowment bias, loss aversion, optimism and status quo.

4. Prospect Theory

A concept given by Kahneman and Tversky (1979). This theory analyses the decision making process of individuals under risk. Here the choices are determined in terms of loss and gains. It suggests that same level of joy and pain does not have equal effect on people. An average individual tends to be more sensitive towards losses than gains. This tendency is called loss aversion.

The use of prospect theory is more appropriate in behavioral finance research as suggested by prominent scholars in this area (Barberis, 2013). To be specific, the prospect theory postulates that individuals behave differently in their decision making that is risk-seeking in losses domain and risk-averse in gains domain with the middle point being the reference points. Due to the expected heterogeneity behavior of investors at the individual security and market level, the nonparametric and nonlinear statistics are best suited for inferential analysis in behavioural finance (Nawrocki & Viole, 2014).

Overconfidence and stock market participation
When people overestimate the reliability of their knowledge and skills, it is the manifestation of overconfidence (DeBondt & Thaler, 1995, p. 389, Hvide, 2002, p. 15).

Many researchers studied overconfidence and analyzed the unsafe outcomes of overconfidence with the aid of investors; these studies printed that investors had been overconfident in their investing capabilities and such will result in making investment mistakes (P. Bolton, M. K. Brunnermeier, and L. Veldkamp, 2013). Therefore, in accordance to preceding researchers the overconfidence element is one of the most harmful biases that an investor can show, and this is because buyers behavioral are naturally underestimating downside risk, trading too frequently, and conserving below assorted portfolio (F. Squintani, 2013).

Those studies measured overconfidence by dividing its thought into numerous dimensions: Chaffai (2014) measured the overconfidence by the usage of two dimensions (stock retained periods, amount of information to be collected).

L. Xu, X. Shi, P. Du, K. Govindan, and Z. Zhang 2019, analyzed the impact of the retailer's overconfidence on pricing and supply chain performance. They found that the selling price charged by the retailer is increasing with the overconfidence level, and overconfidence does not necessarily damage the supply chain performance.

Loss Aversion and stock market participation
People are more willing to take risks (or behave dishonestly; e.g. Schindler & Pfattheicher, 2017) to avoid a loss than to make a gain. Loss aversion has been used to explain the endowment effect and sunk cost fallacy, and it may also play a role in the status quo bias. People's cultural background may influence the extent to which they are averse to losses (e.g. Wang et al., 2017).

During the past several decades, many psychological studies have shown that humans have innate behavioral biases that cause them to make irrational choices. The behavioral biases

unveiled by such studies increasingly have been applied to decision making in the financial markets. One of the key findings in behavioral economics is loss aversion, a bias revealed by psychologists Daniel Kahneman and Amos Tversky. In studies of human decision making, they discovered that the pain people feel from a loss is about as twice as strong as the pleasure felt from an equivalent experience of gain—referred to as loss aversion. Dirk H. & Lisa Emsbo-M. 2013

Constructing portfolio and stock market participation
Mental accounting: Mental accounting sets the basis for segregating different investments in separating different investments in separate accounts each to be considered alone. A reference point in each mental account determines whether the current position is considered a gain or loss (John R. N. 2016).

Naïve diversification: Evidence suggests that investors use 'naïve' policies of thumb for portfolio building in the absence of higher information. (Alistair B & Stephen P.Utkus, 2013). One such rule has been dubbed the '1/n' approach, where buyers allocate equally to the vary of handy asset lessons or money ('n' stands for the range of options available). This strategy ignores the specific risk-return traits of the investments and the relationships between them. Investors may recognize the importance of diversification, however now not knowing exactly how to achieve it, go for a simple approach. The twist right here is that in spite of the obvious behavioral bias, latest research has shown buyers the use of naïve '1/n' strategies can every so often do higher than the investors who assemble portfolios the use of sophisticated computer models (Alistair B & Stephen P.Utkus, 2013).

Biases and stock market participation
Availability: " the availability of consequences associated with a motion was positively associated to perceptions of the magnitude of the consequences of that action" Jayaraj (2013, p.25). Kudryavtsev et al. (2013) explained that availability heuristic was applied when people estimated the probability of an event based on the ease with which it could be imagined.

Representativeness: Representativeness bias also leads to a psychological error known as the base-rate neglect. That is, when making judgements, people normally do not consider all relevant information that could affect their decisions. They make probability judgments that systematically violate Bayes' rule. The literature also documents that representativeness bias motivates individuals to neglect the effect of sample-size in their decisions. That is, people sometimes erroneously assume that generalized conclusions may be drawn from a small-sample of information (Gabriel. V. Komba, 2016).

This representative heuristic made buyers take speedy decisions at the fee of judging resemblances which had been in basic terms superficial. This heuristic led to undesirable significance given to the similarities between the occasions thereby ignoring the variables vital for determining the probability of the event (Jayaraj, 2013).

The Representative Heuristics is a mental shortcut that helps us make a decision by comparing information to our mental prototypes or stereotypes. It is the tendency to judge the frequency or likelihood of an event by the extent to which it resembles the typical case. Heavy reliance on this leads people to ignore other factors that heavily influence the actual frequencies and likelihoods, such as rules of chance, independence, and norms (Stephen D. 2019).

5. Methodology

A survey was conducted on 376 respondents obtained through stratified random sampling technique from 18,764 individuals and group investors in the Rwanda Stock Exchange market. Data was gathered by means of structured self-administered questionnaires and analyzed using regression analysis and descriptive statistics.

6. Result and Findings

6.1 Source of information on stock market

From the results in table 1; 50% of the respondents get information on stock market via channels like newspapers, public campaign and radio, 16% of total respondents get informed via Internet while the remaining 34% of total respondents get informed via TV. The results suggest that most people get stock market information on channels like public campaign, radio and minority via TV. These findings suggest that many would be investors in stock exchange market do not have adequate knowledge on its benefits of investing in the stock market.

Table 1: Source of information on stock market

Source of information	TV/		Internet/		Other channels/		Total/ Frequency	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Agree	119	34	8	16	25	50	50	100
Disagree	105	30	20	40	15	30	50	100
Non-committal	126	36	22	44	10	20	50	100

6.2 Respondent's opinion on behavioral finance

Results in table 2; rated overconfidence first with a score of (4.22) and a standard deviation (0.825) While, Loss aversion, Constructing portfolio and Biases were rated 2nd, 3rd and 4th with mean scores of 4.02, 3.85 and 3.74 respectively.

Table 2: Respondent's opinion on behavioral finance

No	Respondents opinion Overconfidence	1	2	3	4	5	Mean	Standard Deviation
1	Overconfidence has direct applications in investment in shares, which can be complex and involve forecasts of the future	0%	0%	24%	46%	30%	4.06	0.74
2	Investors with too much confidence in their shares trading skill often trade too much, with a negative effect on their returns	0%	2%	20%	32%	46%	4.22	0.84
3	When you faced with a positive outcome following an equity investment decision, you view that outcome as a reflection of your ability and skill.	0%	0%	36%	30%	34%	3.98	0.845
4	When you faced with a negative outcome, this is attributed to bad luck or misfortune	0%	2	26	24%	48%	4.18	0.896
	General average for overconfidence	0%	1%	27%	33%	40%	4.11	0.825
	Loss Aversion							
	General average for loss aversion Constructing portfolio	0%	1%	32%	30%	37%	4.02	0.856
8	You tend to exhibit a greater tendency to accept short-term losses and their effects by evaluating stock investments and performance at the aggregate level, with a 'wide' frame,	0%	0%	38%	40%	22%	3.84	0.766
9	The portfolio allocations should be based on a combination of 'insurance' (protection against losses) and 'lotteries' (small odds of a large gain)	0%	2%	38%	28%	32%	3.9	0.886
10	You use the mental accounting by organizing your portfolio into separate Accounts	0%	4%	36%	36%	24%	3.8	0.857
	General average for constructing portfolio Biases	0%	2%	37%	35%	26%	3.85	0.827
11	"Availability bias" You are more likely to be fearful of a stock market crash when one has occurred in the recent past.	0%	0%	48%	30%	22%	3.74	0.803
12	"Representativeness bias" You consider the past performance of an investment as an indication of its future performance	0%	2%	64%	18%	16%	3.48	0.789
13	You assume that shares in a high-profile, well-managed company will automatically be a good investment	0%	0%	30%	40%	30%	4	0.782
	General average for biases	0%	1%	47%	29%	23%	3.74	0.758

6.3 Correlation of Financial Behavioral and Stock Market Participation

The model summary table 3; explains the percentage of the dependent variable (stock market participation) that can be determined by the independent variable (behavioral finance). According to the model summary, the independent variables account for 60.8% (R Square, 0.608) of the dependent variable, While the remaining 39.2% can be explained by other factors outside the scope of this model, this implies that the relationship between the dependent and independent variables is statistically significant, thus any change in behavioral finance will also affect the stock market participation. Also, the Pearson correlation coefficient (R) result also shows that positive value of 0.780, which also support the fact that both variables have direct influence on each other.

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.780[a]	.608	.607	.325

b. Predictors: (Constant), Behavioral finance

ANOVA

The ANOVA (Analysis of variance) was conducted to determine if the result of the model summary above can be relied upon and the result established that P- value obtained (0.000) was lower than the alpha level of 5% specified in SPSS for this analysis, therefore, this implies that behavioral finance has significant impact on stock market participation. Thus, any effort by the investors to enhance behavioral finance will have a multiplier positive effect on stock market participation.

Table 4: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	56.977	1	56.977	539.718	.000[b]
	Residual	36.738	348	.106		
	Total	93.714	349			

a. Dependent Variable: Stock market participation
b. Predictors: (Constant), Behavioral finance

Coefficients

Multiple Regression analysis was also conducted to determine if the result shown in ANOVA Statistic is statistically correct, and the result shows that the P-value obtained (i.e.0.000) for the regression coefficient was also lower than the alpha level of significance of 5% specified in SPSS for this analysis, therefore, it can be inferred from this result, that the ANOVA Statistic was correct. Therefore, there is significant relationship between investment in stock market and behavioral finance.

Table 5: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.409	0.095		14.874	0
	Behavioral finance	0.581	0.025	0.78	23.232	0

a. Dependent Variable: Stock market participation

7. Discussions

The study confirmed a significant impact of overconfidence on stock market participation in Rwanda Stock Exchange. This indicates that investors overestimates their own ability, performance, level of control and/or probability of success as found by Luc V. Gasteren, (2016). The loss aversion had

a significant impact of on stock market participation. This means that loss aversion investors can avoid loss by keeping far from investment with high loss probability. This result does not contradict with those of Schindler & Pfattheicher, 2017 who stated that people are more willing to take risks to avoid a loss than to make a gain. The findings also showed that there was significant effect of constructing portfolio on stock market participation. This supports (John R. N. 2016) who found that mental accounting allows investors to organize their portfolio into separate accounts. The findings also showed that there was significant effect of biases on stock market participation. This refers those investors in Rwanda Stock Exchange who assume that assume that shares in a high-profile, well-managed company will automatically be a good investment. This supports (Stephen D. 2019) who assumes the biases is the tendency to judge the frequency or likelihood of an event by the extent to which it resembles the typical case.

8. Conclusions and Recommendations

Drawing from theoretical and empirical evidence the study concludes that there was a significant impact of overconfidence, loss aversion, constructing portfolio and biases on stock market participation in Rwanda Stock Exchange. The results further showed that most people get stock market information on channels like public campaign, radio and via TV. Based on the latter, the study concludes that a majority of would be investors do not have sufficient knowledge on the benefits of stock market exchange against which they can make informed decisions on whether to or not invest on the same.

Thus, in line with the conclusions the current study recommends that financial market players should develop appropriate mechanisms that will ensure dissemination of correct stock market information to the general public as well as public and private learning institutions for enhanced participation. Further the study recommends that information on stock markets through the commonly used channels like the TV, radios, and internet be well designed and packaged for ease of understanding. It is imperative that the investors establish forums to support each other in finding reliable information on stock market

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