

# Effect of Psychological Factor on the Individual Investor's Risk Tolerance at Listed Service and Manufacturing Companies in Tanzania

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**Abstract**— one of the important factors in financial and investment decision is risk. The main objective of this study is to examine the effect of psychological factor on the individual investor's risk tolerance at financial and manufacturing companies in Tanzania. The study was use Co-operative Rural Development Bank (CRDB) and Tanzania Cigarette Company (TCC) as study area of the research. The study used a sample of 80 respondents from the selected companies. In addition, the study used secondary data which were obtained from different literatures such as reports, published and unpublished papers and other related documents. Descriptive statistics, factor analysis, and linear regression were used to check both association and influence of psychological factors on individual investors' risk tolerance. The findings show that overconfidence, loss aversion and mental accounting were positive and significantly related to the risk tolerance of individual investors. This study recommends that stakeholders should take into consideration key factors such as gender and income, loss aversion, mental accounting and overconfidence in investing in companies. The study further recommends that, the Government and Regulatory Authority should make use of the findings obtained from this study when formulating and implementing various policies related to investment decision.

**Keywords**— Psychological Factor, Individual Investor's, Risk, Risk Tolerance, Service Companies, Manufacturing Companies, Tanzania

## I. INTRODUCTION

One of the important factors in financial and investment decision is risk [2]. Before making decisions on investment, individual investors first do consider what they will earn as well as the risk associated with investment [19]. Risk is the variability in future returns having two components, namely uncertainty and exposure [15]. Uncertainty occurs when there is a condition of not knowing if something is true or false or if one is aware or unaware of it [10]. Exposure is the condition which is based on three factors namely what could happen, how likely is that scenario to take place and what would the consequence be if a certain event occurs [13]. Risk tolerance is defined as organizations' or stakeholders' readiness to bear the risk after risk treatment in order to achieve its objectives [4]. It is an important factor for both investors and investment managers before making any investment decisions [1].

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However, for individual investors, risk tolerance differs from one person to another and from one country to another, and further, between the developed and developing countries [17]. Several studies conducted in developed countries focused on demographic and psychological factors. According to [12] conducted study in Parkistan basing on gender, education, income and number of dependents. The results obtained from his study reveals that male, high income earners and middle level of education individuals to be more risk tolerant. Furthermore study done by [3] from India using over confidence, mental accounting, gender, marital status and income variables came out with the results showing that individuals who are female, unmarried and overconfident are more risk takers. However, further studies conducted in India by [9] taking into consideration number of dependants, age, education level, gender, mental accounting and overconfidence reveals that individuals with few number of dependants, young stars and overconfident do take more risk hence invest more than individuals with older age and little confidence. In addition, [16] attempted a study in Turkey focus on mental accounting, loss aversion overconfidence as variables affect risk tolerance and came out with the results that individuals who are overconfident are the ones who can tolerate risk and invest in large investments.

In developing countries decisions made by local and foreign investors are affected and influenced by the investment associated risks. As such, investors need to tolerate risk when running investments in emerging economies [5]. Little studies have been conducted in developing countries [6]-[9] concerning factors affecting investors risk tolerance in investment. The studies used demographic and psychological factors variables to determine the factors affecting investors risk tolerance in investment. The study conducted by [7] in Kenya focused on loss aversion, over confidence, gender, experience and education noted that female investors, experienced and those with higher academic qualifications are more risk tolerant than men, less experienced and low academic qualification individuals. Further the study conducted in Nigeria by [14] concentrated on gender, education, number of dependants, mental accounting, loss aversion and overconfidence and the results reveals that few

dependants, high level of education and overconfidence influence more risk tolerance in investment than individuals with many dependants, low confidence and low education qualifications. Observations have shown that there is lack of consistence in determining which variables do exactly influence investors risk tolerance. The empirical literatures reviewed have revealed how various factors influencing investors risk tolerance in various countries of the world [4, 7, 10, 14, 17, 19]. Many studies conducted by researchers have been done in developed countries and little conducted in developing countries and Tanzania has not been one of them. Therefore, this study aims at filling the gap taking CRDB and TCC companies listed in Dar es Salaam stock exchange by adopting geographical and psychological variables that were used in various researches so as to discover the situation in Tanzania.

Due to little studies conducted in Africa [7-9] and very little evidence on available study done in Tanzania on factors affecting investor's risk tolerance. Therefore, this study fulfills this gap by adopting various variables from other studies to assess the factors affecting investors' risk tolerance in Tanzania Listed Companies by using CRDB and the TCC as the case study. These variables will be grouped into two factor namely demographic factor (gender, income, education level, education, age, marital status and number of dependents) and psychological factor (overconfidence, loss aversion and mental accounting). Risk tolerance is an imperative concept that has an implication for both providers and consumers of financial services. The ability of risk tolerance is a major factor for any job related to investment. Risk tolerance of individual investors depends on many factors such as gender, age, education, income, marital status, number of dependents and work other factors include overconfidence, loss aversion and mental accounting. These factors have been grouped into two categories such as demographic factors and psychological factors. There have been many types of researches investigating this problem and presented many different results about factors affecting the risk tolerance of individual investor. Several studies conducted in developed and developing countries revealed that investors' risk tolerance has close linkage with individuals' psychology and attributes which directs common financial and investments practices [7, 13, 19]. Other studies conducted in developed countries explained that different levels of risk tolerance such as high and low risk tolerance of an individual investor can be grouped according to various factors such as demographic, psychological and economic [2, 5, 9, 11, 17].

Furthermore, Studies indicated that men are less risk tolerance than women but the background of education shows that heterogeneous results on risk tolerance [6, 9] presents no impact on risk tolerance. Thus, the results of research on the factor of Education affecting the risk tolerance of individual investors are not consistent. In addition, other studies indicated that individuals employed in professional occupations are more risk tolerant than those employed in non-professional occupations [3] self-employed individuals are more risk tolerant than those employed by others [14] and

high income earners are more risk tolerant than lower income earners [9]. However, there are research data not supporting these beliefs. Therefore, more research is needed to test this assumed relationship. The empirical evidence to determine factors influencing risk tolerance of an individual investor especially in listed companies is inadequate. Moreover, to the best of my knowledge and understanding, none of the studies in determine factors influencing individual risk tolerance in Tanzania listed companies are available in the international economic literatures. Most studies related to determinants of individual risk tolerance come from European countries, Australia, the United States and other African countries. Therefore, more empirical studies are needed to accurately identifying psychological factor on the individual investor's risk tolerance especially in listed companies.

## II. LITERATURE REVIEW

According to [18] conduct a study in India to examine the empirical analysis of financial risk tolerance and psychological features of individual investor of 300 respondents working at two Universities of Kerala and Mahtama Ghandi University in 2010. Using six independent variables (anchoring, overconfidence, representatives, mental accounting, cognitive bias and loss aversion) and one dependant variable (financial risk tolerance) it is found that the psychological bias or factors that play a significant role in determining financial risk tolerance are loss aversion, mental accounting, overconfidence while representative and anchoring was not influencing financial risk tolerance. According [1] conducted a study in India on exploring into the role of psychological biases in financial investment decisions by individuals and their financial risk tolerance where psychological biases (overconfidence, loss aversion and mental accounting) were termed to be the major. The study examined the relationship between psychological variables and personality traits on investors' attitude towards risk. The author ascertained that there is a positive relationship between loss aversion, mental accounting and risk tolerance level while overconfidence had a negative association with risk tolerance.

## III. RESEARCH METHODOLOGY

This study adopted explanatory research design which provides the explanation of the effect and causes correlation between study variables. The study was conducted in CRDB and TCC public companies with shares listed on the Dar es Salaam Stock Exchange. The companies were chosen as the representative of service and manufacturing industries because they are characterized with number of individual investors compared to other companies. The study population was formed from individual investor who current invested in CRDB and TCC who constituted individual investors. This study used random sampling technique to select investors of CRDB and TCC for data collection. The study used a sample of 80 Investors from the selected companies. In addition, the study used secondary data which were obtained from different literatures such as reports, published and unpublished papers and other related documents. Descriptive statistics, factor analysis, and linear regression were used to check both

association and influence of psychological factors on individual investors' risk tolerance. The study will ensure data validity by pilot study in each phase also the researchers will ensure data reliability by conducting Cronbach's Alpha test when is greater than 0.7 is more acceptable. According to this study the Cronbach's Alpha is 0.835 for 13 items. In this study the researcher ensured ethical consideration by informed consent of the participants by observing their voluntary participation also researcher maintained anonymity (no mentioning of names by using codes or numbers). Before Data analysis the following parametric tests was done to ensure data validity and data reliability as following results.

**A. Preliminary Test (Diagnostic Checking)**

In the construction of statistical models, model validity is critically imperative to ensure unbiased and valid statistical inferences. Therefore many model diagnostic tests have been formulated for checking and detecting model misspecification. The study undertakes normality tests, heteroscedasticity and multicollinearity.

**B. Normality Test**

Most of the parametric tests such as T-test and regression are holding the presumption of typical dissemination. Subsequently, analyze the typical appropriation of the model must not be overlooked. While ordinariness presumption expects that unsettling influences or mistake terms of the model are regularly appropriated. Since mistake terms are the factors that have been overlooked, the effect of the precluded factors must be little and, best case scenario, arbitrary. On the off chance that this suspicion doesn't hold, this prompts mistaken outcomes and draw deluding translations. There are two different ways to check ordinariness normally the realistic strategy utilizing diagrams to imagine the dispersion and normality test. Normality, test is sensitive enough at a low sample size or very sensitive to large sample size. This study used Jarque-bera test for testing normality, the test rejects the hypothesis of normality when the p-value is less than or equal to 0.05. From Table 1 indicated that, the data are normally distributed since the p-value (0.0678) for the Jarque-Bera (test for normality assumption) is greater than 0.05, hence there is no sufficient evidence to reject the null hypothesis at 0.05 significance level.

**Table 1: Jarque-Bera (Test for Normality Assumption)**

Variab le	Obs	Pr(Skew ness)	Pr(Kur tosis)	adj chi2(2)	Prob>c hi2
G	80	0.0567	0.0348	0.648	0.0678

Source: Study Findings (2020)

**A. Multicollinearity**

Multicollinearity happens when at least two free factors are profoundly related, consequently can't precisely mirror their individual commitments towards the needy variable (Pesaran, 2015). Multicollinearity is brought about by information assortment strategy, over-characterized model, model detail

and limitations on model or in the population. This study carried out multicollinearity test using the Variance Inflation Factor (VIF) method. The VIF estimates how much the variance of a regression coefficient is inflated due to multicollinearity in the model. The VIF was calculated by taking an independent variable and regressing it against every independent variable in the model. This gave R-squared values which were plugged into the VIF formula.

$$VIF_i = \frac{1}{1 - R_i^2}$$

Where  $R_i^2$  is the R-squared value from regressed independent variables. The rule of thumb states that there is evidence of collinearity if the mean VIF is greater than unity or if the largest VIF is greater than 10 [6]. From Table.2 the results indicated that, there is no multicollinearity since the average VIF is 3.85 which is below 10 mean VIF.

**Table 2: VIF Test of Multicollinearity**

Variable	VIF	1/VIF
2.Gender	1.17	0.854181
Age		
2	1.3	0.76648
3	1.94	0.514861
Education		
2	10.07	0.099334
3	11.77	0.084985
4	6.73	0.148651
Dependents		
2	2.48	0.402729
3	3.8	0.263297
2.Marital	1.33	0.749217
2.Employment	1.16	0.859083
Income level		
2	2.78	0.359228
3	1.62	0.617524
<b>Mean VIF</b>	<b>3.85</b>	

Source: Study Findings (2020)

**A. Heteroscedasticity**

When the variance of error term differs with each observation in such case heteroscedasticity is said to exist. A unequal variance may violate the assumption of classical linear regression model and cause the model to be inefficient. These can be caused when data collection method improved, presence of outlier observation and according to human behavior. This study used Cameron and Triyedi's decomposition of IM test to check for heteroscedasticity. Also, the test provides the result on normality of data.

**Table 3: Heteroscedasticity-Cameron & Trivedi's Decomposition of IM-test**

Source	chi2	Df	P
Heteroscedasticity	68.58	51	0.0507
Skewness	15.07	12	0.2378
Kurtosis	1.8	1	0.18
<b>Total</b>	<b>85.45</b>	<b>64</b>	<b>0.0379</b>

Source: Study Findings (2020)

The result from Table 3 shows that the model do not suffer with the problem of heteroscedasticity since the p-value (0.0507) for heteroscedasticity is greater than 0.05 and also it show that the model do not suffer with the problem of non-normality assumption since the p-value is greater than 0.05.

## V. RESULTS AND DISCUSSIONS

### PSYCHOLOGICAL FACTOR ON THE INDIVIDUAL INVESTOR'S RISK TOLERANCE AT CRDB AND TCC

Multiple regressions analysis employed to determine influence of over confidence, loss on individual investor risk tolerance at CRDB and TCC in the study area. Result in the table 4.17 below indicates that independent variable included in the model was good predictors of individual investor risk tolerance. About 93.2% of variations of individual investor risk tolerance explained by the variations in the independent variable included in the model. Results further indicated that explanatory variable included in the model had a significant influence on the individual investor risk tolerance ( $F = 346.19$ ,  $P < 0.001$ ).

**Overconfidence;** The overconfidence bias identifies with the conviction that financial specialists hold to the way that they can practice mineral control in their choice than they can truly do. Careless financial specialists put more reliance on their prescient expertise in distinguishing and picking winning ventures. From Table 4 below it is indicated that, over confidence was significant at  $P < 0.05$  and with coefficient of 0.679 implying that as the confidence increased by 1 score the risk tolerance would increase by 0.679 score. Similarly, [18] found that overconfidence and anchoring play essential role in determining the financial risk tolerance and financial risk behaviour such variables fluctuate while mental accounting had weak influence on financial risk tolerance. According to [4] point out as a result of overconfidence, investors tend to overestimate their ability to develop market forecast and force them to enter into either risk investment or less risk investment. These findings comply with [7] found that men exhibit more overconfident characteristics, such as excessive trading and higher risk taking than women. This study had a big proportion of respondents being financially literate and this could explain the high risk taking behaviour leading to over trading due to overconfidence.

**Loss Aversion;** Loss aversion makes hesitance in individuals to settle on choices for change for the simple actuality that they extraordinarily center around what they are probably going to lose than they may wind up picking up. The

circumstance displayed by speculators as a rule terms is that are in control of losing positions, they procure a more grounded want to reestablish their position simply even to an earn back the original investment status. Then again, similar financial specialists would have a danger lenient conduct or be danger looking for when confronting a misfortune and in this manner they could wish to hang on the speculations with the expectation that costs ascend once more. From the Table 4 indicated that, loss aversion influenced individual investor risk tolerance with regression coefficient of 0.284 implying that, as loss aversion score increased by 1 score then individual investor risk tolerance by 0.284 score. These findings are supported by Ahmed *et al.* (2013) who pointed out that, loss aversion and representative are significant influencing the risk decision of investor compared tax rates which had weak correlation to risk tolerance level. According to [2] found that the psychological bias or factors that play a significant role in determining financial risk tolerance are loss aversion and overconfidence while representative and mental accounting (heuristics) was not influencing financial risk tolerance.

**Mental Accounting;** Investor have propensity of building mental edges regarding their ventures. This inclination is known as mental bookkeeping and it depicts conduct in which financial specialists place specific choice into mental records that are gotten from their own shallow attribute. Result from Table 4. showed that, mental accounting was insignificant at  $P < 0.05$  and with coefficient of 0.06249 implying that as the confidence increased by 1 score the risk tolerance would increase by 0.0624 score. The result re consistent to [3] supported ascertained that there is a negative relationship between mental accounting, overconfidence and risk tolerance.

According to [7] revealed that mental accounting was more pervasive in individual financial specialists than institutional speculators. The propensity of financial specialists to make mental edge is fuelled by speculation condition where speculators feel more torment when they are acclimated with a misfortune and apparently they determine more joy when accomplish an increase from a particular investment.

**Table 4: Multiple Regressions for Psychological Factors**

VARIABLES	(1) Score Tolerance
Over confidence	0.679*** (0.121)
Loss aversion	0.284** (0.125)
Mental accounting	0.0624 (0.207)
Constant	1.636 (0.991)
Observations	80
R-squared	0.932

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: Study Findings, (2020)

## VI.CONCLUSION

The study concludes that psychological factors such as overconfidence and loss aversion were significantly and a positive influencing the risk tolerance of individual investors. Majority of investor in CRDB and TCC were characterized will average risk tolerance and below average risk tolerance level since which implies they are not willing to take high risk in undertaking different portfolio. Finally, the study concludes that majority of individual investors in CRDB and TCC comprise or characterized with average and below average individual risk tolerance. This conclusion supported by [4, 7, 11, 18].

The study recommends shareholders, such as investors should take into consideration the effect of psychological biases in their risk decision which indicating their risk taking capacity. The study recommends the capital and securities market authority to have an insight on the influence of psychological biases on influencing the risk taking capacity of investors of listed firms and Also government and other responsible authority are recommended to make use of such information from the study findings to formulate and implement various policies related to taking risk investment factors.

The study suggests further studies to be carried out on a similar topic but in different industries. There is a need to conduct similar studies on commercial banks and other listed sector such as service, manufacturing and others. Also, the study recommends further studies should adopt more factors on psychological and personal traits variables such as social moods, perception, representative bias, and cognitive dissonance. Finally, the study suggest similar studies to be undertaken in evaluating how demographic, psychological and other factors can influence investment patterns of both individuals and institutional investors of listed companies in TANZANIA.

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