Articles

Impact of Psychological Variables on Investment Decision: Empirical Evidence from Bangladeshi Investors

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Abstract

Investors' (in fact, human) psychology is mysterious to comprehend. The ultimate aspiration of this study was to find out how psychological variables manipulate investors' rational investment decisions into irrational decisions. Traditional finance by and large ignores psychological aspects of investors' investment decisions though it has an enormous impact on investment decisions. In this study researcher tried to demonstrate how investors' psychological variables play imperative role on investment decision. To conduct this research, 200 investors (From DSE and CSE) were considered as sample to collect primary data through a structured questionnaire consisting 30 questions on dependent and independent variables to analysis and interpret their psychological aspects on investment decision. Mainly, regression analysis was adopted to analyze and interpret data using statistical tool like 'Statistical Package for the Social Sciences' (SPSS). From the results of the analysis, researcher found that psychological variables play immense role to be irrational behavior on investment decision of the investors in Bangladesh. This paper also suggested some courses of action to the investors, policymakers and researchers to consider in the future.

Keywords: Psychological Variables, Investment Decisions, Investors, Bangladesh.

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1.0 Introduction

Behavioral aspect of finance is being emphasized across the world. Since traditional aspect of finance does not pay attention to the psychological behavior of investors, behavioral finance has been griping a big part of investors' investment decision. As per conventional financial theory investors are considered that they are rational and wealth can maximize in financial decisions. However the idea of fully rational investors that have perfect control on their decisions to maximize their utility is becoming less popular. In efficient markets investors are considered as rational, unbiased and consistent who make optimal investment decisions without the effects of psyche and emotions. Investors do not make always rational decision while making investment decision. Different anomalies are observed when investors try to make their investment decisions. On other hand, Efficient Market Hypothesis (EMH) states that markets are always efficient, but in reality markets are not always efficient. An abnormal market behavior can occur, such as the January effect, Monday effect, which means that human behavior influences securities prices and, therefore, markets - Pompian, M. M. (2006).

Different psychological variables contribute to be irrational investment behavior in investors in Bangladesh. Basically, this paper deals with five independent psychological variables i.e. overconfidence, representativeness, mental accounting, regret aversion and loss aversion long with a dependent variable investment decision. In Bangladesh investors were found irrational behavior in terms of their investment decisions. Markets were found volatile, again and again market crash took place, investors left from this kind of markets immediately due to market behavior which led by irrational behavior of investment decision - Molla, M. E. (2018).

Figure 1: Prospect Theory, Kahneman, D., & Tversky, A. (1979)
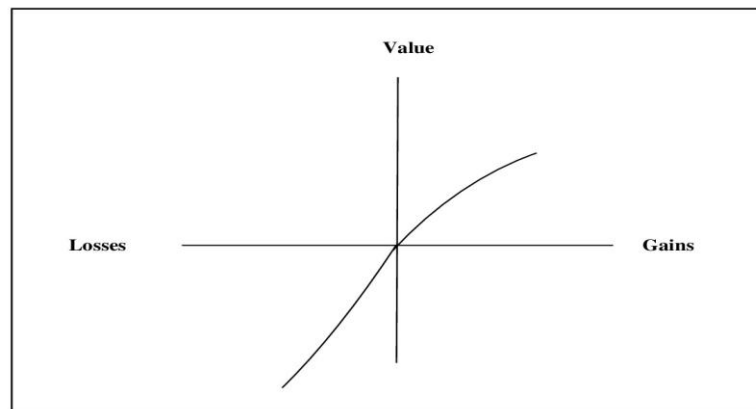
Reference dependence and loss aversion are ingredients of prospect theory claimed by Kahneman, D., & Tversky, A. (1979); Kahneman, D., & Tversky, A. (1992), wherein individuals maximize a weighted sum across states of the states of the world of value functions (utilities), value depends on gains or losses rather than levels, and where the weights are functions of probabilities. In the figure 1, suggesting that value is an S-shaped function of gain or loss (dual risk attitudes) resulting in risk aversion in the gain domain and risk seeking in the loss domain. Loss aversion is reflected in a kink in the value function at zero gain or loss.

1.1 Problem Statement

In this study psychological variables were considered to find out the impact of these variables on investment decision of Bangladeshi investors. While collecting data it was found that the current subject matter seemed to be unknown to the investors. They actually did not know how would react on the variables of research questions. Some investors were found unwilling to share their information to researcher. Few investors even did not want to talk for a single moment and reacted badly. For being psychological variables it was tough to

analyze and interpret all the variables during the research work. Since, Bangladeshi investors' psychological aspects were considered to examine in this current field, researcher needed to have sufficient secondary data on this field from previous studies. But researcher found inadequate data while searching available secondary data sources on Bangladeshi investors' in this research field.

1.2 Significance of the Study

This paper shows how behavioral aspects of finance can be impactful on investors' investment decisions. Many countries like Bangladesh investors have been experiencing a number of times massive market collapses. Researchers usually used to investigating and relating the reasons and consequences of the market behavior using traditional finance tools like time value of money, risk and return calculation, capital budgeting technique, cost of capital etc. for the investors investment decision. In contrast, investors' psychological aspects were generally ignored by the researchers, investors and other agencies in Bangladesh, practitioners and related agencies - Molla, M. E. (2018). As a result, this study would have been considered an empirical evidence to contribute in the field of behavioral finance.

1.3 Scope of the Study

Understanding investors' psychological impact on investment decision, this paper would contribute splendidly. As it has been observing that concentrating and practicing behavioral aspects of finance has been inadequate in Bangladesh, this study will certainly unlock the current situations to concentrate and practice more behavioral finance as a basic courses for the students, investors, researchers and concerned parties.

1.4 The Study Objectives

The main objective of this study was to explore how actually psychological variables impactful on investors' investment decisions in Bangladesh. To some extent precise objectives of this paper were;
a. To know the major psychological variables.
b. To find out how psychological variables play crucial role on investment decision.
c. To analyze data, interpret on findings and present some recommendations to concern parties.

1.5 Research Gap

The most common way cross pragmatic cams is to spot various gaps in the literature - Sandberg, J., & Alvesson, M. (2011). Especially in Bangladesh, researchers emphasize and pay attention on traditional finance. Therefore, adequate research works relating to traditional finance were available in this country. On the other hand, behavioral or psychological aspects of finance were somehow ignored over the years. Even in the higher studies students were being taught a little on behavioral finance. Psychological aspects always play a big part of financial decisions that should be remembered by all stakeholders of the country. As, in this field was ignored for a long period of time by the researcher and policymakers, no remarkable research works had been conducted on this current field in Bangladesh. Therefore, researcher tried to contribute on behavioral aspects of finance as much as possible.

1.6 Limitations of the Study

Collection of data sets was somehow seemed to be inconsistent because the respondents (investors) were reluctant to convey their opinion for the sake of confidentiality. If they conveyed their opinion perfectly this would have made the study more exact and factual. Opinion of respondents was collected from Dhaka metropolitan areas for the convenience sampling of the study though it was thought that geographic, demographic sates would largely contribute to change psychological behavior of the investors. Therefore, the opinion presented in this study might be seemed as a prejudiced one. Besides, Psychological variables were actually hard to interpret. Therefore, anyone could make their opinion differently.

2.0 Review of Literature

A review of prior, relevant literature is an essential feature of any academic or research work. An effective review creates a firm foundation for advancing knowledge. It facilitates theory development, closes areas where a plethora of research exists, and uncovers areas where research is needed - Webster, J., & Watson, R. T. (2002). As per understanding the impact of psychological variables and investment decision, researcher should review sufficient studies on the research filed. There were different books, published articles; seminar & conference papers and research reports had been reviewed in this part of this paper. This would be helpful to highlight the research gap of the study.

Chen, G. (2007) et al. found that investors were highly overconfident to make investment decision which led to poor returns from their investments. Doukas, J. A., & Petmezas, D. (2007) claimed that overconfidence played a greater role in higher order acquisition deals predicting lower wealth effects for higher order acquisition deals. Researcher also suggested that overconfident bidders realized lower announcement returns than rational bidders and exhibited poor long-term performance. Erceg, N. et al. (2014) explored that the occurrence of the overconfidence bias and the conjunction fallacy in betting behavior among frequent and sporadic bettors and to test whether it was influenced by the task format (probability vs. frequencies). Pompian, M. M. (2006) described that overconfidence could be summarized as unwarranted faith in one's intuitive reasoning, judgments and cognitive abilities. Scott, J., Stumpp, M., & Xu, P. (2003) suggested that overconfidence variable most likely to occur. Besides, researchers found that people (investors) were particularly overconfident on their abilities. Winman, A. (2004) et al. demonstrated that overconfidence bias occurred when investors produced intervals for an uncertain quantity was abolished when they evaluated the probability that the same intervals included the quantity. Zaidi, F. B., & Tauni, M. Z. (2012) showed that there was a high degree of association between overconfidence and investors irrational investment decisions.

Chan, W. S. (2004) examined a central psychological bias, representativeness, which was underlying many behavioral-finance theories. Researchers added that representativeness bias formed in individuals predictions about future outcomes based on how closely past outcomes fit certain categories. Chen, G. (2007) et al. found that investors were highly found representativeness biased to make investment decision which led to poor investments decisions with poor returns from their investments. Coval, J. D., & Shumway, T. (2005) explained if traders afflicted with a representativeness bias view morning trading conditions as overly reflective of those they (traders) could expect to face in the afternoon, profitable mornings were followed by amplified afternoon risk-taking. Hirshleifer, D. (2015) claimed that by the representativeness heuristic investors seemed to fixate on that pattern and overcorrect. Researcher also described that combination of effects generated return momentum and reversal, and an overcorrection pattern in response to trends in public value signals (e.g. earnings news sequences). Molla, M. E. et al. (2018) found that investors were biased due to behavioral variables that formed in their (investors) predictions about how future outcomes would be based on close past outcomes fit certain categories that was why investors lost their capital over the years. Pompian, M. M. (2006) summarized that some investors tended to rely on stereotype when making investment decisions. Individuals prone to sample-size neglect were quick to treat properties reflected in such small samples as properties that accurately described universal pools of data. The small sample that the individual had examined, however, might not be representative whatsoever of the data at large.

Thaler, R. H. (1990) found in empirical evidence that investors tried to save their money in the different accounts i.e. pension fund, savings account and so on which might cost them high level of return from investment in the portfolios. Prelec, D., & Loewenstein, G. (1998) proposed a double entry mental accounting theory that described the natures of reciprocal interactions between pleasure of consumption and pain of paying and drew out their implication on investors' investment behavior. Pompian, M. M. (2006) stated that mental accounting would describe how distinct financial decision (investment decisions) might be evaluated

jointly (i.e. as though they pertain to the same mental accounting) or separately. Grinblatt, M., & Han, B. (2005) found that if the relevant accounts were profits in individual stocks, mental accounting would generate a disposition effect. Due to that in risk attitudes, investors subjected to mental accounting have a greater tendency to sell stocks that had gone up in value as purchased. Soman, D. (2004) claimed that traditionally thought investors were rational but practically they were irrational in terms of considering different accounts rather than investing in a profitable portfolio. Cherry, T. L. (2001) proposed that investors behaved different way over money from different sources with investors possessing different marginal propensity to consume for every element of wealth.

Zeelenberg, M. et al. (1996) explained that the large disparity often observed between the minimal amount that people were willing to accept to give up a good they owned and the maximal amount they would be willing to acquire it. Seiler, M. (2008) presented that regret aversion needed to explain behavior in low-payoff settings would imply absurd level of regret aversion in high-payoff settings. Pompian, M. M. (2006) claimed that people exhibiting regret aversion avoid taking decisive actions because they feared that, in hindsight, whatever course they select would prove less tan optimal. Molla, M. E. (2018) found that investors did not want to invest due to regret aversion behavior because already they got several devastating experience from their investment in the stock market. Zeelenberg, M., & Pieters, R. (2004) explained that investors tried to avoid investing due to regret aversion. They felt that if loss took place of their investment that might not be tolerable and they actually did not expect be.

Kahneman, D. (1991) et al. concluded that the study of risky choice had been such choices explained by assuming the significant carriers of utility were not states of wealth or welfare, but changed relative to a neutral reference point. Another central result was that changed making things worse (losses) loom larger than improvements of gains. Tversky, A., & Kahneman, D. (1991) demonstrated that losses and disadvantages had greater impact on preferences than gains and advantages. Implications of loss aversion for economic behavior were considered. Pompian, M. M. (2006) stated that the possibility of a loss was on average twice as powerful a motivator as the possibility of making gain of equal magnitude that was a loss-averse person might demand, at minimum, a two-dollar gain for every one dollar placed at risk. Genesove, D., & Mayer, C. (2001) showed that loss aversion was an important feature in explaining sellers' behavior in the housing market. Besides, it was mentioned that the larger the prospective loss, the smaller the marginal mark-up of list price over expected selling. Li, Y. J., Kenrick, (2012) revealed that mating motives selectively erased loss aversion in men. In contrast, self-protective motives led both men and women to become more loss averse. Overall, loss averse appeared to be sensitive to evolutionary important motives, suggesting that it might be a dominant-specific bias operating according to an adaptive logic of recurring threats and opportunities in different evolutionary domains.

3.0 Development of Conceptual Framework

In this study, especially five psychological variables were considered as independent variables along with one dependent variable of investment decision. These variables were examined by the thirty (30) specific questions relating to the individual variable. To some extent, the study focused on why and how overconfidence, representativeness, mental accounting, regret aversion and loss aversion variables persuade investors' investment decision. Following model was developed by the researcher specifically for this study that might open the unexplored gates of behavioral finance.

Figure 2: Conceptual Model for understanding of psychological variables on investment decision
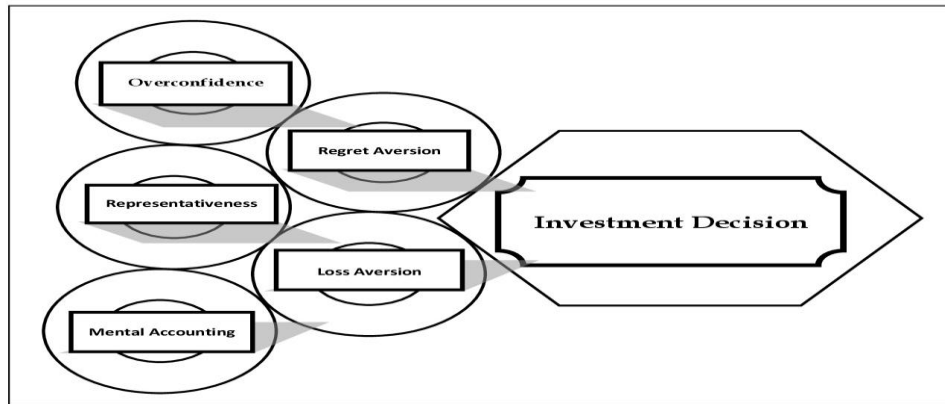
In the above figure 2, researcher tried to showcase different psychological variables on investment decision. Overconfidence represents cognitive behavior, by the variable researcher explained that investors overestimate on decision making capability but underestimates risk. Besides, representativeness indicates cognitive behavior. It was mentioned, investors believe that past and present performance would consistently continue in the future. Mental accounting prescribes as cognitive behavior. By the variable it was meant, investors maintain different accounts of a particular amount of funds. On the other hand, regret aversion prescribes as emotional behavior. By which, investors avoid taking decisive actions of an investment on account of fear of making less than optimal decision and finally, loss aversion explains as emotional behavior of the investors. It was elucidated that investors feel stronger impulse to avoid losses than to acquire gains.

4.0 Development of Hypotheses

To conduct further study, some hypotheses were developed to know the impact of psychological variables on investors' investment decision. H_0, indicated that null hypothesis which might be accepted or rejected as per results of developed model.

$H_0 1$: There would be no significant impact of overconfidence on investors' decision making.

$H_0 2$: There would be no significant impact of representativeness on investors' decision making.

$H_0 3$: There would be no significant impact of mental accounting on investors' decision making.

$H_0 4$: There would be no significant impact of regret aversion on investors' decision making.

$H_0 5$: There would be no significant impact of loss aversion on investors' decision making.

5.0 Methodology of the Study

Both primary and secondary data were collected to conduct this research. This paper emphasized on quantitative and qualitative data to analyzed. Primary data were collected through a structured questionnaire from the investors in Bangladesh which administrated personally towards investors consisting 30 questions. In which five independent variables (overconfidence, representativeness, mental accounting, regret aversion and loss aversion) consisted 25 questions and one dependent variable (investment decision) consisted 5 questions. The questionnaire was developed by using 5 point Likert Scale, where: 1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree and 5= Strongly Agree. Basically, population (investors) of this study was considered to Dhaka Stock Exchange (DSE) and Chittagong Stock Exchange (CSE) those who were investing at least last ten consecutive years precisely from 2010 to 2018. Around 500 investors (from both DSE and CSE) were considered as population for this research. Statistical tests of significance tell, the likelihood that experimental results differ from chance expectations, effect-size measurements tell that the relative magnitude of the experimental treatment - Thalheimer, W., & Cook, S. (2002). Among them 200 (from DSE 120 and CSE 80) were picked up from Dhaka city which partitioned into 4 strata or batches to conduct this research. Elements were selected according to each spectrum or batch by a random sampling technique. In contrast,

secondary data were collected from scholars' research articles of different impactful international and national journals, books and other authentic web links relating to psychological variables and investors' investment decisions.

In this study, popular statistical methods were applied to test of hypotheses and variables to relate with the objectives of the research. Linear regression models, their variants and extensions are among the most useful and widely used statistical tools for research - Fox, J. (1997). Mainly, test of reliability, regression analysis were considered to carry out this research using software tool like 'Statistical Package for the Social Sciences' (SPSS) - 23 version.

6.0 Data Analysis and Discussion on Findings
Results are the most important part of the paper. It is required to present them clearly by avoiding long and confusing sentences. Presenting analyzed data shorter in tables and figures, the better - Alexandrov, A. V. (2004). In this section, data were analyzed and discussed on findings. A set of tests had been applied to understand impact of psychological variables on investors' investment decision in Bangladeshi investors. It is mentionable that all outputs of model information were generated from 'Statistical Package for the Social Sciences' (SPSS) software.

6.1 Data Reliability Test
The question of reliability rises as the function of scales is stretched to encompass the realm of prediction. One of the most reliability statistics in use today is Cronbach's alpha - Santos, J. R. A. (1999). Cronbach's alpha is the convenient test used to estimate reliability or internal consistency of a composite score. Usually it gives a result 0 to 1 but sometimes negative results may provide. Negative result indicates data in not fit for the test. On the other hand, general rule of thumb, Cronbach's alpha .70 and above is the good result, .80 and above better result and .90 and above is the best. Therefore, in the Table 1, Cronbach's alpha for the thirty items was .90, suggesting that the items had the best internal consistency of the independent variables (overconfidence, representativeness, mental accounting, regret aversion and loss aversion) on dependent variable of investment decision to carry out further analysis.

Table 1: Test of Reliability through Cronbach's Alpha

Reliability Statistics	
Cronbach's Alpha	Number of Items
.898	30

6.2 Regression Analysis: Independent Variables on Dependent Variable
Statistical data analysis programs commonly compute the p-values during the execution of hypothesis test. Adjusted R-squared, on the other hand, gives the percentage of variation explained by only those independent variables that in reality affect the dependent variable.

6.2.1 Overconfidence on investment decision ($H_0 1$)
A simple linear regression was calculated to find out whether independent variable (overconfidence, a psychological variable) had significant impact on dependent variable (investment decision). Null hypothesis ($H_0 1$) was stated that there was no significant impact between independent variable on dependent variable. In the Tables 4, 5: b = .93, t (198) = 2.76 and p < .05, on the other hand, results shown in the tables by calculations in the Tables 3, 4: F (1, 198) = 1169.24, p < .001, with an adjusted R^2 = .85. The linear regression equation is; Y = a + bX (where, Y = dependent variable, b = slope, X = independent variable and a = constant). Therefore, the equation was found as, Y = .33 + .93X. The regression model states that if p value (probability value) is lesser than alpha value (standard level of significance, α =.05) then the model is significant. In this study, developed model was highly significant with p value (p < .001) at the standard level

of significance level (α =.05). On the other hand, adjusted R^2 (adjusted R^2 indicates that the percentage of variation explained by only the independent variables that actually affect the dependent variable) .85 or 85% of variance in dependent variable (investment decision) could be explained by independent variable (overconfidence). Precisely, it was found that there was significant impact on independent variable (overconfidence, a psychological variable) on dependent variable (investment decision). So, Null hypothesis was rejected. Finally, it was concluded that overconfidence had significant impact on investment decision.

Table 2: Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Overconfidence[b]	.	Enter

a. Dependent Variable: Investment Decision, b. All requested variables entered.

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.925[a]	.855	**.854**	.270

a. Predictors: (Constant), Overconfidence

Table 4: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	85.091	**1**	85.091	**1169.238**	**.000[b]**
	Residual	14.409	**198**	.073		
	Total	99.500	199			

a. Dependent Variable: Investment Decision, b. Predictors: (Constant), Overconfidence

Table 5: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	**.329**	.119		**2.758**	**.006**
	Overconfidence	.923	.027	**.925**	34.194	.000

a. Dependent Variable: Investment Decision

6.2.2 Representativeness on investment decision (H₀2)

A simple linear regression was calculated to find out whether independent variable (representativeness, a psychological variable) had significant impact on dependent variable (investment decision). Null hypothesis (H₀) was stated that there was no significant impact between independent variable on dependent variable. In the Tables 8, 9: b = .87, t (198) = 4.72 and p < .05, on the other hand, results shown in the tables by calculations in the Tables 7, 8: F (1, 198) = 613.928, p < .001, with an adjusted R^2 = .76. The linear regression equation is; Y = a + bX (where, Y = dependent variable, b = slope, X = independent variable and a = constant). Therefore, in this study, the equation was found as, Y = .70 + .87X. The regression model states that if p value (probability value) is lesser than alpha value (standard level of significance, α =.05) then the model is significant. On the other hand, adjusted R^2 (adjusted R^2 indicates that the percentage of variation explained by only the independent variables that actually affect the dependent variable) .76 or 76% of variance in dependent variable (investment decision) could be explained by independent variable (representativeness). Precisely, it was found that there was significant impact on independent variable (representativeness, a psychological variable) on dependent variable (investment decision). So, Null hypothesis was rejected. Finally, it was concluded that representativeness had significant impact on investment decision.

Table 6: Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Representativeness[b]	.	Enter

a. Dependent Variable: Investment Decision, b. All requested variables entered.

Table 7: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.870[a]	.756	**.755**	.350

a. Predictors: (Constant), Representativeness

Table 8: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	75.236	**1**	75.236	**613.928**	**.000[b]**
	Residual	24.264	**198**	.123		
	Total	99.500	199			

a. Dependent Variable: Investment Decision, b. Predictors: (Constant), Representativeness

Table 9: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	**.704**	.149		**4.719**	**.000**
	Representativeness	.843	.034	**.870**	24.778	.000

a. Dependent Variable: Investment Decision

6.2.3 Mental Accounting on investment decision (H$_0$3)

A simple linear regression was calculated to find out whether independent variable (mental accounting, a psychological variable) had significant impact on dependent variable (investment decision). Null hypothesis (H$_0$) was stated that there was no significant impact between independent variable on dependent variable. In the Tables 12, 13: b = .96, t (198) = 2.02 and p < .05, on the other hand, results shown in the tables by calculations in the Tables 11, 12: F (1, 198) = 2354.95, p < .001, with an adjusted R^2 = .92. The linear regression equation is; Y = a + bX (where, Y = dependent variable, b = slope, X = independent variable and a = constant). Therefore, in this study, the equation was found as, Y = .18 + .96X. The regression model states that if p value (probability value) is lesser than alpha value (standard level of significance, α =.05) then the model is significant. In this study, developed model was highly significant with p value (p < .001) at the standard level of significance level (α =.05). On the other hand, adjusted R^2 (adjusted R^2 indicates that the percentage of variation explained by only the independent variables that actually affect the dependent variable) .92 or 92% of variance in dependent variable (investment decision) could be explained by independent variable (mental accounting). Precisely, it was found that there was a high impact on independent variable (mental accounting, a psychological variable) on dependent variable (investment decision). So, Null hypothesis was rejected. Finally, it was concluded that mental accounting had high impact on investment decision.

Table 10: Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Mental Accounting[b]	.	Enter

Table 11: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estima
1	.960[a]	.922	**.922**	.197

a. Predictors: (Constant), Mental Accounting

Table 12: ANOVA[a]

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	91.783	**1**	91.783	**2354.950**	**.000**[b]
	Residual	7.717	**198**	.039		
	Total	99.500	199			

a. Dependent Variable: Investment Decision, b. Predictors: (Constant), Mental Accounting

Table 13: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	**.176**	.087		**2.023**	**.044**
	Mental Accounting	.955	.020	**.960**	48.528	.000

a. Dependent Variable: Investment Decision

6.2.4 Regret Aversion on investment decision (H_04)

A simple linear regression was calculated to find out whether independent variable (regret aversion, a psychological variable) had significant impact on dependent variable (investment decision). Null hypothesis (H_0) was stated that there was no significant impact between independent variable on dependent variable. In the Tables 16, 17: b = .97, t (198) = 3.32 and p < .05, on the other hand, results shown in the tables by calculations in the Tables 15, 16: F (1, 198) = 3289.868, p < .001, with an adjusted R^2 = .94. The linear regression equation is; Y = a + bX (where, Y = dependent variable, b = slope, X = independent variable and a = constant). Therefore, in this study, the equation was found as, Y = .24 + .97X. The regression model states that if p value (probability value) is lesser than alpha value (standard level of significance, α =.05) then the model is significant. In this study, developed model was highly significant with p value (p < .001) at the standard level of significance level (α =.05). On the other hand, adjusted R^2 (adjusted R^2 indicates that the percentage of variation explained by only the independent variables that actually affect the dependent variable) .94 or 94% of variance in dependent variable (investment decision) could be explained by independent variable (regret aversion). Precisely, it was found that there was a high impact on independent variable (mental accounting, a psychological variable) on dependent variable (investment decision). So, Null hypothesis was rejected. Finally, it was concluded that regret aversion had significant impact on investment decision.

Table 14: Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Regret Aversion[b]	.	Enter

a. Dependent Variable: Investment Decision, b. All requested variables entered.

Table 15: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.971[a]	.943	**.943**	.169

a. Predictors: (Constant), Regret Aversion

Table 16: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	93.852	**1**	93.852	**3289.868**	**.000[b]**
	Residual	5.648	**198**	.029		
	Total	99.500	199			

a. Dependent Variable: Investment Decision, b. Predictors: (Constant), Regret Aversion

Table 17: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	**.241**	.073		**3.319**	**.001**
	Regret Aversion	.949	.017	**.971**	57.357	.000

a. Dependent Variable: Investment Decision

6.2.5 Loss Aversion on investment decision ($H_0 5$)

A simple linear regression was calculated to find out whether independent variable (loss aversion, a psychological variable) had significant impact on dependent variable (investment decision). Null hypothesis (H_0) was stated that there was no significant impact between independent variable on dependent variable. In the Tables 20, 21: b = .88, t (198) = 3.79 and p < .001, on the other hand, results shown in the tables by calculations in the Tables 19, 20: F (1, 198) = 684.07, p < .001, with an adjusted R^2 = .77. The linear regression equation is; Y = a + bX (where, Y = dependent variable, b = slope, X = independent variable and a = constant). Therefore, in this study, the equation was found as, Y = .56 + .88X. The regression model states that if p value (probability value) is lesser than alpha value (standard level of significance, α =.05) then the model is significant. In this study, developed model was highly significant with p value (p < .001) at the standard level of significance level (α =.05). On the other hand, adjusted R^2 (adjusted R^2 indicates that the percentage of variation explained by only the independent variables that actually affect the dependent variable) .77 or 77% of variance in dependent variable (investment decision) could be explained by independent variable (regret aversion). Precisely, it was found that there was a high impact on independent variable (loss aversion, a psychological variable) on dependent variable (investment decision). So, Null hypothesis was rejected. Finally, it was concluded that loss aversion had significant impact on investment decision.

Table 18: Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Loss Aversion[b]	.	Enter

a. Dependent Variable: Investment Decision, b. All requested variables entered.

Table 19: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.881[a]	.776	**.774**	.336

a. Predictors: (Constant), Loss Aversion

Table 20: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	77.165	**1**	77.165	**684.069**	**.000**[b]
	Residual	22.335	**198**	.113		
	Total	99.500	199			

a. Dependent Variable: Investment Decision, b. Predictors: (Constant), Loss Aversion

Table 21: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	**.557**	.147		**3.791**	**.000**
	Loss Aversion	.872	.033	**.881**	26.155	.000

a. Dependent Variable: Investment Decision

7.0 Conclusion and Recommendation

Conclusions have to be based on the present study findings - Alexandrov, A. V. (2004). The study was begun to understand the impact of psychological variables; overconfidence, representativeness, mental accounting, regret aversion and loss aversion variables influence investors' investment decisions. Through some particular analyses during the study, it was found that data set was more consistent (result of Cronbach's alpha .90) to further analysis. Besides, on the different variables analyzed as per hypotheses using regression model. By the analyses it was understandable that overconfidence, representativeness, mental accounting, regret aversion and loss aversion psychological variables were highly impactful (as highly significant results, $\alpha < .05$) on investment decision among Bangladeshi investors. In addition, adjusted R^2 (the percentage of variation explained by only the independent variables that actually affect the dependent variable) for the all variables were indicating respectively 86%, 76%, 92%, 94% and 77%. Hence, this was clear indication that investors of Bangladesh used to making their investment decision influencing by the psychological variables like overconfidence, representativeness, mental accounting, regret aversion and loss aversion.

In Bangladesh especially investors are required to train up psychologically to make proper decision in the time of investment. The course of behavioral finance should be included as a basic course for all students in education curriculum at least from secondary level. All the related agencies should have basic knowledge on behavioral aspects of finance. Last but not the least, this paper would be helpful for the students, investors, researchers and related stakeholders in future for further studies regarding understanding the impact of psychological variables on investment decision.

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