ILLUSION OF CONTROL, BETTER-THEN-AVERAGE, MISCALIBRATION, DESIRABILITY BIAS AND UNREALISTIC OPTIMISM AGAINST OVERCONFIDENCE BEHAVIOR
(Case Studies on Semarang Investor in Financial Decision Making)

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ABSTRACT

Overconfidence in investment was a bias that affected investor to be too confident when taking financial decision. Sometimes investors are very confidence getting some information and rejecting other contradictive information that in fact is important to be considered before making any financial decision. Physiologists found that humans had a tendency to rely on to unreasonable believes when making decision. Overconfidence itself affected by cognitive biases such as an illusion of control, better-than-average, miscalibration, desirability bias and unrealistic optimism. This study will take a case study on the investor's financial decision.

Research population used was investors Semarang. By calculation of sample from Hair et al, this research used 150 investors as respondents. This research used quantitative method by distributing questionnaires. Questionnaire consisted of 30 questions representing the illusion of control, better-than-average, miscalibration, desirability bias and unrealistic optimism as variables in the research.

The results shown that illusion of control, better-than-average, miscalibration and desirability bias has a positive and significant effect to the overconfidence related in investor's financial decisions. Otherwise, unrealistic optimism indicates negative and significant effect on overconfidence behavior.

Keywords: Behavioral Finance, Overconfidence, Illusion of Control, Better-Than-Average, Miscalibration, Desirability Bias, Unrealistic Optimism, Investor, Multiple Linear Regression Analysis

INTRODUCTION

Mainstream financial theory has become irrelevant nowadays. Mainstream financial theory believe that in doing something related to a financial decision, human considered always to be rational and the market is considered to remain efficient. Mainstream financial theory is not able to reveal the existence of anomalies in financial decisions. According to Ritter (2003) mainstream financial theory has a disadvantage in terms of maximizing expectations of financial decision makers. Then Ritter (2003) revealed that humans are not always rational and the market is not always efficient. This inability creates new research that links psychological actions and inefficient markets known as behavioral finance.

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The theory of financial behavior is a branch of science of economic behavior in terms of financial decisions that relate to aspects of psychology and aspects of sociology (Glaser et al. 2005). Durand et al. (2013) mentions financial behavior related to psychology for explain the phenomena observed in financial markets and conclude psychology underlies the motivation of an investor's behavior. Rostami (2015) explains in financial behavior model, economic actors cannot really renew their ideas. In other words they use multiple choice questions and are not consistent with the expected subjective thinking. Ricciardi (2000) explains that financial behavior takes two main parts in financial theory namely first discussing cognitive psychology which analyzes how people think and second discusses arbitration limits when the market becomes inefficient.

One of the influential aspects of the theory of financial behavior is overconfidence. Overconfidence is an aspect that makes economic actors dares to bear the risks to be taken (Pompian, 2006). Byrne and Utkus (2013) revealed in psychology research it was found that humans tend to have unwarranted beliefs in decision making. Barber and Odean (1999) revealed that researchers have told economic actors to assess their own abilities in any case for example in driving a vehicle, and found that most of them rated themselves above the average of most people and only a few considered themselves lower than average. In testing model assumptions, overconfidence is widely known through research conducted by Barber and Odean (2001) which analyzes trading activities conducted by investors. The study found that the more investors trade stocks, the worse things will happen, and on average male investors trade more often than female investors. Then a different way is done by Ritter (2003) who explains overconfidence by testing model predictions at the individual level. The research resulted that overconfidence can be viewed from three different ways including (1) too high ability, performance and opportunity for success, (2) believing that yourself is better than others, and (3) relating to excessive certainty regarding the accuracy and confidence of information received by someone. The research was later re-developed by Khan et al. (2016) which examined that better-than-average had a positive effect on overconfidence while the illusion of control and miscalibration did not affect the overconfidence of investors in Malaysia.

Research on overconfidence is quite varied. Giardini et al. (2008) explained that overconfidence is also influenced by other biases namely desirability bias which is influence of reward can affect the bias of desire that ultimately has an impact on someone's overconfidence in making a financial decision. And research by Giardini et al. (2008) indicated that people are relatively more overconfidence if given reward. From research by Weinstein (1980) about unrealistic optimism, unrealistic optimism is present when people make a prediction about future and gives assign probabilities to favorable or unfavorable outcomes that are just too high or low given historical experience or reasoned analysis.

Existing studies show that in conducting financial activities, investors often make mistakes that cause considerable losses. This error occurs because the psychological aspect of the investor himself is not too much attention. In reality this error is a manifestation of financial behavior which states that investor behavior is not always rational. The overconfidence bias has several important elements, namely, illusion of control, better-than-average, miscalibration and desirability bias. Illusion of Control explains a deep conviction about involvement in something in predicting satisfactory results. Better-Than-Average is the ability and confidence of individuals in assessing their own quality better than others. Miscalibration is an individual's ability to receive information accuracy. Desirability bias is the existence of a desire in oneself also affects an action that people will take. The existence of these elements needs to be tested more deeply about their relevance to overconfidence behavior. In further conducting Kurniawan & Arfianto (2017) last experiment, one new variable as the cause of overconfidence was added. The variable explored was taken from the finding of the last research of Ackert & Deaves (2011) and Weinstein (1980), which was

unrealistic optimism. This variable proved that humans tend to predict their personal future either positive or negative based on their experience and analysis.

THEORETICAL THINKING FRAMEWORK AND HYPOTHESES FORMULATION

Influence of Independent Variable on Dependent Variables

Effect of Illusion of Control to Overconfidence Behavior

Illusion of Control is a phenomenon where a person becomes overconfidence when they feel like have control and involvement with the environment or a result, eventough this is clearly not happening (Pompian, 2006). A research by Langer (1975) found that if a person is required to bet on two sides of a coin (head & tail), most people will bet with a greater level of overconfidence before the coin is thrown. But when the coins have been thrown and they are told to bet, the level of overconfidence will be lower. People act as if their involvement in something affects the results. This is definitely a bias. Presson et al., (1996) explained the key that encourages the existence of an illusion of control is an option, sequence of results, activities ever performed, information and active involvement.

H1: Illusion of Control has a positive effect on Overconfidence behavior.

Effect of Better-Than-Average to Overconfidence Behavior

Better-Than-Average is a condition where a person perceives himself better than others. Better than average here can be general skills or abilities such as driving skills, oral expression, the ability to get along with others, and to take tests (Benoit, Dubra & Moore, 2008). If you have to assess yourself on a scale of 1-10, most people will judge themselves 7 or 8. It is natural because it is very common for them to judge themselves better, even if in fact it is almost impossible for people to be above average in more specific quality. This phenomenon has been very common in psychology literature. This is due to many reasons; people are too polite to say what they think, and people who are incompetent do not have the skills to accurately assess their ability, people thinks this bias is to protect their own mental health. However, this bias can also have an adverse effect especially when it comes to financial decision making.

H2: Better-than-average has a positive effect on Overconfidence behavior.

Effect of Miscalibration to Overconfidence Behavior

Miscalibration is a situation where people received overload information and misinterpret the information or overly assumes that information is important which can reflect to excessive action. Daniel, Hirshleifer & Subrahmanyam (1998) explained that miscalibration or can be called overprecision is an answer to the difficulties of investors in stock market. Investors, who are too confident about the expected information obtained, will be willing to trade more than other investors with different information.

H3: Miscalibration has a positive effect on Overconfidence behavior

Effect of Desirability Bias to Overconfidence Behavior

Desirability Bias is a tendency of subjects to respond of what they really want. Desirability Bias will be a factor that affects a person's overconfidence level. Research by Giardini et al. (2008) mentioned when people are asked to foresee the possibility of future events, they tend to think of favorable events with little or no possibility of their purpose. Desirability bias is an indicator to highlight the presence and characteristics of overconfidence.

H4: Desirability Bias positively affects Overconfidence behavior

Effect of Unrealistic Optimism to Overconfidence Behavior

Unrealistic optimism is tendency for people to believe that they are less likely to experience negative events and more likely to experience positive events than are other people. Research by Jefferson, Bortolotti, & Kuzmanovic (2017) people evaluate their own prospects as better than those of similar others or another specific reference group, in other words, they expect that positive outcomes are more likely and negative outcomes are less likely to occur for oneself than for others.

H5: Unrealistic Optimism positively affects Overconfidence behavior

Picture 1
Framework
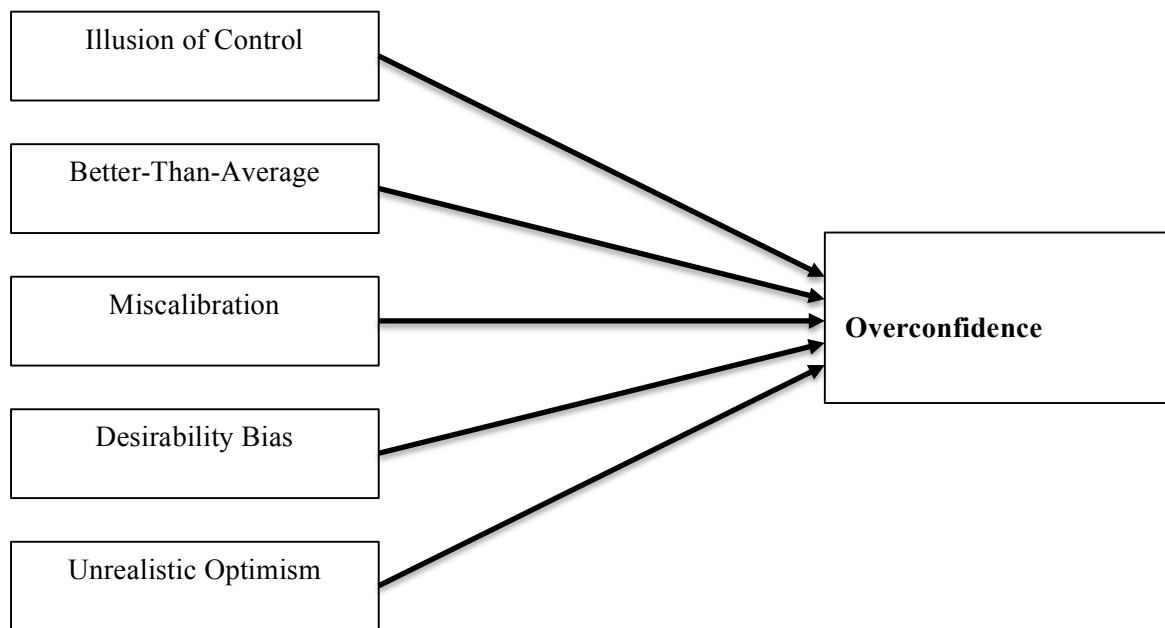
Source : Kurniawan & Arfianto (2017) and Ackert & Deaves (2011)

RESEARCH METHODS

Research Variable

Variables in this study consisted of 5 independent variables and 1 dependent variable. The dependent variable is the variable that is influenced by other variables. In this study the dependent variable is overconfidence (Y) behavior. Independent variables in this study are: illusion of control (X1), better-than-average (X2), miscalibration (X3), bias desirability (X4) and unrealistic optimism (X5).

Population and Sample

Population in this study is investor in Semarang. For sample, Hair et al., (2010) suggested that for regression type of analysis, the sample size should fall between five and ten times the number of indicator variables. So the determination of the sample in regression type of analysis for investor behavior in selecting stock as much as 150 respondents.

Method of Collecting Data

The data collection method used is to distribute the questionnaire to the selected corresponds. The questionnaire is a set of question forms prepared according to the

research variables and is specifically made to be answered by correspondents. The measurement standard used is the ratio scale which states the value which is free from the lowest or highest in accordance with the wishes to be known in the research. The ratio scale is used to measure perceptions, opinions and attitudes of the correspondent of a phenomenon which is the subject of research which in this scale will also describe the actual data of the variables studied (Cooper and Schindler, 2014). The scale type of ratio used is the graphic rating scale which is a scale created to allow researchers to determine the difference of the variable value (Cooper and Schindler, 2014).

Furthermore, graphic rating scale will measure the level of satisfaction of respondents from the least agree to the most agree. In this type of scale which has 10 cm long, the respondent will tick mark ($\checkmark$) along the line according to the possibility of a preference answer. The position of tick mark ($\checkmark$) will be measured by using the predefined standard and will get the data in the form of ratio. The example of the form of graphic rating scale is as follows;

STS ————————————————————— *SS*

Explanation;
STS = *Sangat Tidak Setuju*
SS = *Sangat Setuju*

Method of Analyzing Data

Data analysis method is a data processing to measure the relationship between one variable with other variables. The independent variables will be examined to see the occurrence of a positive or negative relationship to the dependent variable. The collected data will be simplified into a simpler form so it is more informative and more understandable. Data analysis can conclude the research results by answering the questions that have been provided so as to reveal the phenomenon being discussed. Appropriate analytical methods are necessary to provide accurate results. Data analysis used in this research is by using Descriptive Statistics Test, Data Quality Test, Classic Assumption Test, Multiple Linear Regression Analysis Test and Hypothesis Testing.

RESEARCH RESULT AND DISCUSSION

Description of Research Objects

The objects of research used in this research are investor in Semarang. Semarang, as capital city of Central Java, has a rapid development of its economy, infrastructure and tourism. This is very influential in the development of investment in Semarang. Head of representative office of Indonesia Stock Exchange (IDX) in Semarang, Mr Fanny Rifki El Fuad, declare that on 2018 the number of investors that already recorded in Semarang City until June 2018 is 18,550 investors. This increased by 20 percent compared to 2017.

Table 1
Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
OVERCONFIDECE	150	38.40	10.50	48.90	34.1113	7.67701	58.936
ILLUSION OF CONTROL	150	26.40	22.50	48.90	38.7000	5.67485	32.204
BETTER-THAN-AVERAGE	150	39.00	9.40	48.40	31.8893	8.68310	75.396
MISCALIBRATION	150	41.70	6.90	48.60	37.9980	8.19375	67.138
DESIRABILITY BIAS	150	40.70	8.20	48.90	38.3613	7.50297	56.295
UNREALISTIC OPTIMISM	150	37.10	11.60	48.70	37.8807	8.45036	71.409
Valid N (listwise)	150						

Source : Primary data, SPSS 2018

Multicollinearity Test

Multicollinearity test aims to test whether in a regression model found a correlation between independent variables (independent variables). According to Ghozali (2011) shows the existence of multicollinearity Tolerance value <0.10 or equal to VIF value>10.

Table 2
Multicollenearity
Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Illusion of Control	0.699	1.432
	Better-Than-Average	0.720	1.389
	Miscalibration	0.694	1.442
	Desirability Bias	0.620	1.612
	Unrealistic Optimism	0.762	1.312

a. Dependent Variable: Overconfidence
Source : Primary data, SPSS 2018

Based on the results from table 3 above shows that overall all independent variables have a tolerance value above 0.10 and the value of variance inflation factor (VIF) is less than 10. So it can be concluded that overall there is no multicollinearity among independent variables in the regression model.

Autocorrelation Test

The autocorrelation test aims to test whether in linear regression model there is a correlation between intruder errors in a period with errors in the previous period (Ghozali, 2011). The autocorrelation test in this study used Watson Durbin Test.

Table 3
Autocorrelation Test

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.905[a]	.819	.813	3.32113	2.083

a. Predictors: (Constant), UNREALISTIC OPTIMISM, ILLUSION OF CONTROL, BETTER-THAN-AVERAGE, MISCALIBRATION, DESIRABILITY BIAS
b. Dependent Variable: OVERCONFIDECE
Source : Primary data, SPSS 2018

Autocorrelation test with DW-test was determined by upper bound (dU) and lower bound (dL). Number of respondents in this study (n) was 150 and the number of dependent and independent variables (k) was 6 with a significance value of 0.05 obtained upper bound value (dU) of 1.817 and lower bound (dL) of 1.651. Value of Durbin-Watson on Table 3 shown 2.083, where fulfilled the requirements of du < d < 4-du. Can be concluded there was no autocorrelation in this study so regression result was free from deviations of classical assumptions.

Heteroscedasticity Test

Heteroscedasticity test is done with the aims to know whether there is variance from one residual observation with other observation. Heteroskedasticity test can be seen by looking at the scatterplot graph shown by following graph;
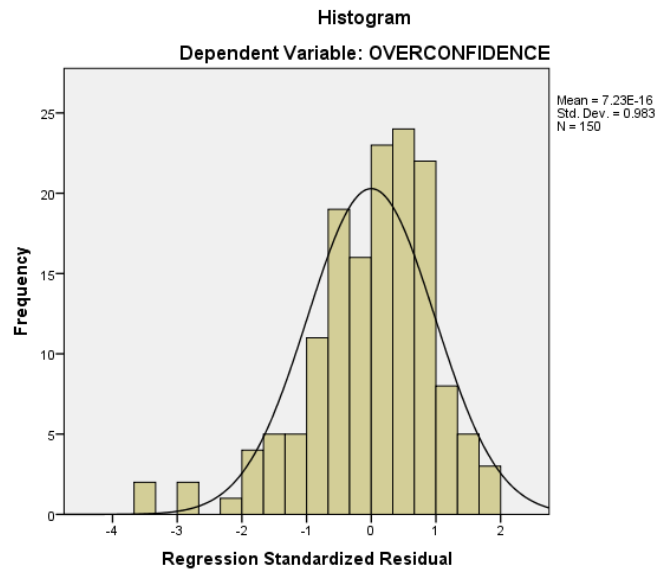
Graph 1
Scatterplot Graph
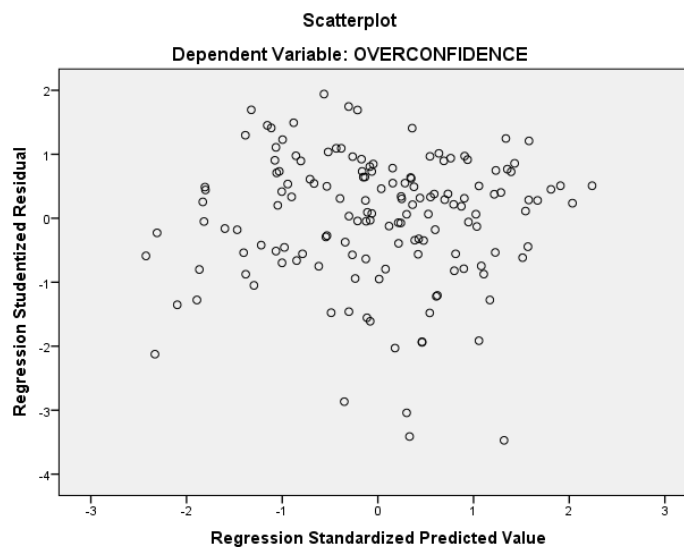
Source: Primary data, SPSS 2018

The dots in Graph 1 did not appear to form in a particular pattern and scattered randomly either above or below 0 on Y axis. Thus can be said that regression model did not occur heteroscedasticity.
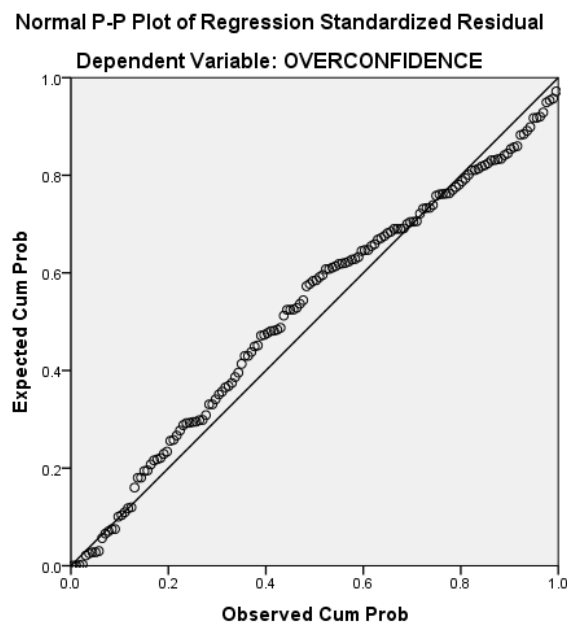
Normality Test

Normality test is a method of analysis that aimed to see the nature of residual variable whether it has a normal distribution in the regression model or not. A good regression model is a regression model that has normal or near-normal distribution. For normality test in this study used graph analysis by looking at the Histogram, Normal Probability Plot and statistical analysis through Kolmogrov-Smirnov Test. Normality test results are as follows;

Graph 2
Normality Test by Histogram

Source : Primary data, SPSS 2018

Graph 3
Normality Test by Normal Probability Plot

Source : Primary data, SPSS 2018

From Graph 2, histogram showed distribution pattern of the data that approximately close to normal and its distributed in diagonal line, which fulfill the normality assumption.

In Graph 3, Normal Probability Plot showed distribution of dots was following normal lines and had non-widespread distribution. Analysis from both graphs has shown that regression model is normal. Then Kolmogrov-Smirnov Test results are follows;

Table 4
Normality Test

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		150
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	3.26493411
Most Extreme Differences	Absolute	.150
	Positive	.150
	Negative	-.087
Test Statistic		.150
Asymp. Sig. (2-tailed)		.200[c]

a. Test distribution is Normal.
b. Calculated from data.
Source : Primary data, SPSS 2018

Based on Table 4 result it can be shown that Kolmogrov-Smirnov value was 0.094 and has significance value of 0.200 which greater than 0.05. Result indicated H0 was accepted since residual data regression was normally distributed and suit with Histogram Graph and Normal Probability Plot Graph.

Multiple Linear Regression Analysis

Determination Coefficient Test (R^2)

The coefficient of determination (R^2) describes which the ability of the independent variable can explain the dependent variable. The coefficient of determination is used to test the goodness-fit of the regression model. The following is the coefficient of determination obtained from the adjusted value (R^2):

Table 5
Coefficient of Determination Test (Adjusted R^2)

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.905[a]	.819	.813	3.32113	2.083

a. Predictors: (Constant), UNREALISTIC OPTIMISM, ILLUSION OF CONTROL, BETTER-

THAN-AVERAGE, MISCALIBRATION, DESIRABILITY BIAS

b. Dependent Variable: OVERCONFIDECE
Source : Primary data, SPSS 2018

Based on these results, value of Coefficient of Determination (Adjusted R2) of 81,3% and Standard Error of the Estimate of 3.332113. This means that independent variables in this study can only explain the amount of dependent variable of 81,3%, while remaining 18,7% is influenced by other variables outside the regression model. The other variables that are expected to influence overconfidence behavior are in accordance with the mentioned Pompian (2006) such as Self Control Bias.

Significance Test (F - test)

F - Test is used to determine whether all independent variables simultaneously have a significant influence on the dependent variable. Result of F - Test is shown in Figure 4.20;

Table 6
F-Test

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7193.221	5	1438.644	130.431	.000[b]
	Residual	1588.309	144	11.030		
	Total	8781.531	149			

a. Dependent Variable: OVERCONFIDECE
b. Predictors: (Constant), UNREALISTIC OPTIMISM, ILLUSION OF CONTROL, BETTER-THAN-AVERAGE, MISCALIBRATION, DESIRABILITY BIAS
Source : Primary data, SPSS 2018

Based on Table 6 obtained F value of 130.431 with a significance level of 0.000. To find value of F table, by using N1 = k – 1 and N2 = n – k. n as total respondents of this research was 150, while k as total variables was 6. For this study N1 has 5 and N2 has 144. Value of F table was equal to 2.28 with a confidence level of 5%. Since F count was greater than F table it can be concluded that H0 rejected and H1 accepted. With H1 accepted, so together independent variables have a significant effect on dependent variable.

Partial Test (t test)

This test is used to explain the relationship generated by the independent variable of influence on the dependent variable that can be seen from the magnitude of significance value.

Table 7
Results of Multiple Linear Regression Analysis and Test t
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	.323	2.061		.156	.876
	ILLUSION OF CONTROL	.220	.054	.163	4.041	.000
	BETTER-THAN-AVERAGE	.058	.038	.065	2.530	.016
	MISCALIBRATION	1.130	.125	1.206	9.059	.000
	DESIRABILITY BIAS	.300	.164	.330	2.833	.010
	UNREALISTIC OPTIMISM	-.804	.176	-.786	-4.560	.000

a. Dependent Variable: Overconfidence
Source : Primary data, SPSS 2018

Table 7 presents the results of multiple regression analysis results, from the results can be formulated into regression equations, as follows:

$$Y = 0.163 \, X1 + 0.065 \, X2 + 1.206 \, X3 + 0.33 \, X4 - 0.786 X5$$

10

Conclusion according to t-test results are as follows;
1. H1: Illusion of Control has a positive effect on Overconfidence behavior
    Result of t-test at Table 4.21 shown probability significant value of 0.000 was smaller than level of significance used (α = 5% or 0,05). Value of t count obtained was 4.041 which greater than 1.976 as value of t table. Result of t-test stated that variable of Illusion of Control has a positive and significant effect on Overconfidence behavior. So the first hypothesis (H1) in the study was accepted.
2. H2: Better-Than-Average has a positive effect on Overconfidence behavior
    Result of t-test at Table 4.21 shown probability significant value of 0.016 was smaller than level of significance used (α = 5% or 0,05). Value of t count obtained was 2.530 which greater than 1.976 as value of t table. Result of t-test stated that variable of Better-Than-Average has a positive and significant effect on Overconfidence behavior. So the second hypothesis (H2) in the study was accepted.
3. H3: Miscalibration has a positive effect on Overconfidence behavior
    Result of t-test at Table 4.21 shown probability significant value of 0.000 was smaller than level of significance used (α = 5% or 0,05). Value of t count obtained was 9.059 which greater than 1.976 as value of t table. Result of t-test stated that variable of Miscalibration has a positive and significant effect on Overconfidence behavior. So the third hypothesis (H3) in the study was accepted.
4. H4: Desirability Bias has a positive effect on Overconfidence behavior
    Result of t-test at Table 4.21 shown probability significant value of 0.010 was smaller than level of significance used (α = 5% or 0,05). Value of t count obtained was 2.833 which greater than 1.976 as value of t table. Result of t-test stated that variable of Desirability Bias has a positive and significant effect on Overconfidence behavior. So the fourth hypothesis (H4) in the study was accepted.
5. H5: Unrealistic Optimism has a positive effect on Overconfidence behavior
    Result of t-test at Table 4.21 shown probability significant value of 0.000 was smaller than level of significance used (α = 5% or 0,05). Value of t count obtained was – 4.560 which smaller than 1.976 as value of t table. Result of t-test stated that variable Unrealistic Optimism has a negative and significant effect on Overconfidence behavior. So the fifth hypothesis (H5) in the study was rejected.

CONCLUSION
    Illusion of Control has a positive effect on Overconfidence behavior is accepted, the greater involvement of a person in making financial decision (Illusion of Control), the greater beliefs it has and will impact on behavior of Overconfidence. Better-Than-Average has a positive effect on Overconfidence behavior is accepted, the greater a person's believe that they have better ability than others, the higher the Overconfidence behavior the person will perform. Miscalibration has a positive effect on Overconfidence behavior is accepted, the more information received by investors, investors has a tendency to quick judging over some information that has been obtained which ended with misinterpretation. Desirability Bias positively affects Overconfidence behavior is accepted, the greater a person's desire to achieve something and interested in greater outcomes can lead to Overconfidence behavior. Unrealistic Optimism positively affects Overconfidence behavior is rejected, which means investor still realistic about their future and relize that bad things could happened to them.

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