

# The Effects of Demographic Factors on Investment Decision: Financial Literacy and Behavioral Bias as Mediating Variables

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## ABSTRACT

In society after COVID-19 Pandemic, awareness on financial well-being is on the rise and many attempts to achieve it through investment. But, to invest means to make decision among numerous alternatives and risks. This research aims to find out how investment actors' demographic factors, financial literacy, and behavioral bias affect the investment decisions they make, where it highlights upon a point still rarely disclosed: whether financial literacy and behavioral bias are able to mediate the relationship between demographic factors and investment decision. The result for SEM-PLS analysis of 151 young investment actors below the age of 25 and adult investment actors of 25 years old and above shows that behavioral bias can act as a mediator while financial literacy cannot; demographic factors that is addition of family members, financial management behavior of financial literacy, and behavioral bias in the form of overconfidence all have a positive and significant effect as well. These findings give the implication that responsibilities towards one's family, as well as financial behavior and self-confidence, play a noticeable role on investment decision.

**Keywords:** *Investment decision, demographic factors, financial literacy, behavioral bias, investment actors*

## 1. INTRODUCTION

Ever since the COVID-19 Pandemic began in 2020, Indonesian economy had been hit with a devastating impact. However, it is exactly because of this unfortunate turn of events that made society keener and more aware of their own financial well-being. A study conducted by Schrodgers [1] showed that in relation with achieving financial well-being, around 43% of people are prioritizing their money on investment. Another survey by Jakpat [2] also revealed how there are numerous of investment actors that have started investing in their early 20s. But, to invest means to make a choice between so many alternatives and risks, of course, the success of one's investment depends on the choices one makes. Then, what are the factors which influence these investment decisions? Previous studies have identified a great number of factors, originating from the investment actors themselves to the environment they operated in. From among those factors, an emphasis is given to the demographic factors which causes people to have different backgrounds and, in consequence, different values in making an investment decision [3].

Along with this factor, two other variables with differing effects are also taken into account: financial literacy that theoretically should be beneficial in making investment decision and behavioral bias that theoretically would hinder investment decision-making. Furthermore, unlike previous studies which often only accounts for the direct effect of these variables, the mediating prowess of financial literacy and behavioral bias against the relationship of demographic factors and investment decision is also a concern to be addressed here.

Referring to the Theory of Planned Behavior developed by Ajzen [4], demographic factors and financial literacy acts as Perceived Behavioral Controls which serve to give a sense of self-efficacy

that will help someone make an investment decision better. But a problem arises as OJK have aroused concern on how low the financial literacy rate of Indonesians still is. This implicates that while a great number of Indonesians already use various financial services on daily basis, they don't actually have the adequate insight needed to properly understand those services [5]. On another note, a person is not always rational in making their decisions, as exhibited in the Prospect Theory by Kahneman and Tversky [6]. This theory demonstrated how people tend to deliberate on choices based on their own individual judgement rather than from an objective point of reference [7]. There are a number of psychological factors which causes someone to behave irrationally. These factors are commonly called behavioral biases. From these, it can be extrapolated that the primary issue to be addressed is the mind of investment actors and how their way of thinking affects their decision-making.

### ***1.1. Related Work***

There are four variables being observed in this paper with the relevant studies used in developing the theoretical framework as follows:

#### *1.1.1. Demographic Factors against Investment Decision*

Kumar and Goyal [8] showed how investment actors' background factors in affecting various stages of their rational decision-making process, particularly the gender and income factors of investment actor's demographic background. Metawa et al. [9] also went to show how age, gender, and education had a positive effect of helping investment actors made an investment decision with regards on their dependence on fundamental and technical analysis. Other than that, Senda et al. [10] added how investment actors who are more mature, with higher income, and longer experience would be able to be better in making an investment decision.

#### *1.1.2. Demographic Factors against Financial Literacy and Behavioral Bias*

Al-Tamimi and Kalli [11] found that male investment actors tend to have higher financial literacy than their female counterpart and this became more prominent as they age. Kadoya et al. [12] also showed how education and experience at work would help increase someone's literacy rate. Tanuwijaya and Setyawan [13] similarly proved that experience in financial context would help improve their literacy. Meanwhile, Kumar and Goyal [8] found that male investment actors were more liable to exhibit overconfidence bias. Baker et al. [14] also demonstrated how different factors relate to behavioral bias, such as how age and experience factors in tendency towards overconfidence bias. Going further, overconfidence and loss aversion will be the two biases to be highlighted.

#### *1.1.3. Financial Literacy and Behavioral Bias against Investment Decision*

Raut [15] and Sivaramakrishnan et al. [16] have proved that, in accordance with the Theory of Planned Behavior, financial literacy can help the function of Perceived Behavioral Control in helping an investment actor make an investment decision. However, the findings of Budiarto and Susanti [17] specified that financial literacy only affects investment decision when it is measured along with other variables, while individually overconfidence and regret aversion bias would have a more significant effect. Ahmad and Shah [18] have also asserted that biases such as overconfidence bias would impact investment decision and performance poorly.

#### *1.1.4. Financial Literacy and Behavioral Bias Mediating Demographic Factors and Investment Decision*

On discussing the mediating capabilities of financial literacy and behavioral bias, Fachrudin and Fachrudin [19] and Metawa et al. [9] have each confirmed that the two variables in question are capable of acting as mediator in the relationship between demographic factors and investment decision. More specifically, it was attested how some factors, such as the demographic factors of age,

education, and experience can only affect investment decision significantly through those two mediating variables.

### **1.2. Our Contribution**

This paper attempts to provide a conclusive answer for the contradicting results of previous studies conducted on the relevant topic, such as how researches in Indonesian settings often found financial literacy insignificant in affecting investment decision, thus corroborating the expansion of behavioral finance literature. Practically speaking, this paper also serves to raise the awareness as well as contributing in the development of governments' investment-related socialization program and helping investment actors better understand what makes for a good investment decision-making.

### **1.3. Paper Structure**

The rest of the paper is organized as follows. Section 2 develops the insights from reviews of previous studies into a theoretical framework as well as introduces the hypotheses proposed in this study. Section 3 presents the results of the analytical measurements and further discussions of those results. Finally, Section 4 concludes the paper and presents suggestion for future research.

## **2. HYPOTHESES DEVELOPMENT**

### **2.1. The Effect of Demographic Factors on Investment Decision**

The development of demographic factors reflects the maturity of an individual, especially in their way of thinking. This contributes to their ability in analyzing and determining the choices to be taken in regard of the situation and risks they are facing. This means investment actors would be more critical in making an investment decision if they are more mature in age, with higher education and income levels, have a responsibility towards their family's financial well-being, have been investing for a longer period of time, etc. Thus, the first hypothesis of this study is as follows:

**H1:** Demographic factors have a positive effect on investment actors' investment decision

### **2.2. The Effect of Demographic Factors on 1) Financial Literacy and 2) Behavioral Bias**

One's mental maturity in relation with their demographic factors will also have a positive impact on their financial literacy, but also their behavioral bias. So the factors mentioned before will result in investment actors having a richer understanding and skill in making a financial decision, but at the same time will also make them more susceptible to biases that can unconsciously affect their decision-making. From this, we can make the next hypothesis as follows:

**H2a:** Demographic factors have a positive effect on investment actors' financial literacy

**H2b:** Demographic factors have a positive effect on investment actors' behavioral bias

### **2.3. The Effect of 1) Financial Literacy and 2) Behavioral Bias on Investment Decision**

Financial literacy is directly related to the ability to process information and attitude shown in a financial setting. Therefore, it is logical to deduce that investment actors with higher literacy will be more critical in assessing all deliberation before making a judgement call. However, behavioral bias on the other hand, will cause investment actors to overestimate their skills while also underestimate the risks involved, or conversely cause them to be too concerned in incurring losses and thus make them unable to make a sound decision. This explanation gives us the following hypotheses:

**H3a:** Financial literacy have a positive effect on investment actors' investment decision

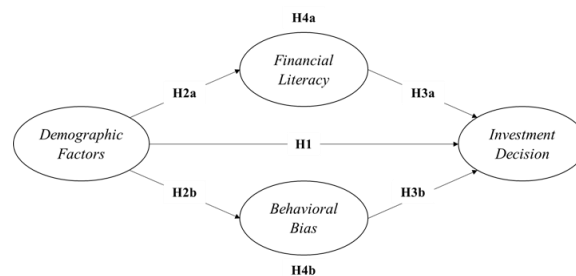
**H3b:** Behavioral bias have a negative effect on investment actors' investment decision

**2.4. The Effect of 1) Financial Literacy and 2) Behavioral Bias on Mediating between Demographic Factors and Investment Decision**

It has been surmised before how the increase in factors behind an investment actor’s background will result in the increase of their knowledge, attitude, and behavior in financial setting as a whole. This, in turn, helps them on making an investment decision. Similarly, those factors will also result in their tendencies of showing biases such as overconfidence or loss aversion that affects their decision-making also. Therefore, the following hypotheses are proposed:

**H4a:** Financial literacy have a positive mediating effect on the relationship of investment actors’ demographic factors and investment decision

**H4b:** Behavioral bias have a positive mediating effect on the relationship of investment actors’ demographic factors and investment decision



**Figure 1** The proposed research model

Figure 1 shows that there is a total of seven relationship to be evaluated in this study, that is the direct effect of demographic factors on investment decision as well as financial literacy and behavioral bias, financial literacy and behavioral bias on investment decision, and the indirect effect of demographic factors on investment decision through financial literacy and behavioral bias.

**3. RESEARCH METHODOLOGY**

This study is categorized as a descriptive (correlational) study employing a cross-sectional data. The population studied here is individuals who have engaged in investment or as it will be further referred to as “investment actors”. In the process of collecting sample, these investment actors are divided into adult investment actors (25 years old and older) and young investment actors (younger than 25 years old) Sawyer et al. [20]. A total of 177 respondents was achieved through an online distribution of questionnaire and 151 among that are used further for the measurement and analysis stage, while the four variables are measured with a six-point Likert scale. These data are then analyzed with PLS-SEM method using the SmartPLS software [21].

**4. RESULTS AND DISCUSSIONS**

After the model has been specified, the first step of evaluation is the outer model analysis which serve to ensure that the indicators and variables used in this study are valid and reliable. Referencing to Hair et al. [22], validity is checked through convergent and discriminant validity with the minimum value of outer loadings and AVE of 0.7 and 0.5 respectively, as well as the utilization of Fornell Larcker criterion. Next, reliability test is conducted through evaluation of composite reliability’s and Cronbach’s Alpha’s value with minimum of 0.7 for each of the criteria. From the numbers shown in table 1, it can be concluded that the research model has passed the validity and reliability check. More specifically, the indicators that are deemed valid for demographic factors are the indicators concerning the increase in family member, for financial literacy is the financial behavior indicators,

for behavioral bias is the overconfidence bias indicators, and indicators of investment decisions are the deliberations used in making a decision.

**Table 1** Measurement and Structural Model Assessment Results

Variables	Indicators	Loading Factors	AVE	Cronbach's Alpha	Composite Reliability
Demographic Factors	DF8	0.927	0.845	0.817	0.916
	DF9	0.912			
Financial Literacy	FL7	0.781	0.642	0.722	0.843
	FL8	0.779			
	FL9	0.842			
Behavioral Bias	BB2	0.758	0.556	0.735	0.834
	BB3	0.719			
	BB4	0.751			
	BB5	0.754			
Investment Decision	ID3	0.780	0.595	0.774	0.855
	ID4	0.778			
	ID5	0.790			
	ID10	0.738			

To test whether the relationships proposed in the hypotheses can be upheld, the inner model analysis is conducted next. The value of the path coefficient of the relationships in concern can be seen in table 2, along with the t-statistics and p-values for the hypotheses test. The minimum value of t-statistics for a hypothesis to be accepted is 1.96, while the p-value must be lower than  $\alpha = 0.05$ . From the seven relationships proposed, five of them—that is H1, H2a, H2b, H3a, and H4b—are accepted. Meanwhile, the effects of behavioral bias on investment decision are found to be positive rather than negative, which is why H3b is rejected. The t-statistics and p-values for H4a showed that it does not have a significant effect, which means financial literacy can be used to mediate the relationship between demographic factors and investment decision, and is therefore rejected.

**Table 2** Path Coefficient and Hypotheses Testing Results

Hypotheses	Original Sample	t-statistics	p-values	Decision
Demographic Factors → Investment Decision	0.228	2.677	0.007	Hypothesis Accepted
Demographic Factors → Financial Literacy	0.435	5.698	0.000	Hypothesis Accepted
Demographic Factors → Behavioral Bias	0.291	3.749	0.000	Hypothesis Accepted
Financial Literacy → Investment Decision	0.202	2.058	0.040	Hypothesis Accepted
Behavioral Bias → Investment Decision	0.371	4.522	0.000	Hypothesis Not Accepted
Demographic Factors → Financial Literacy → Investment Decision	0.088	1.746	0.081	Hypothesis Not Accepted
Demographic Factors → Behavioral Bias → Investment Decision	0.108	2.785	0.005	Hypothesis Accepted

The findings of H1 assessment showed how demographic factors—specifically the increase on the number of family member—will have a positive effect on investment decision, indicating that investment actors will be more critical in assessing risks and alternatives before making a financial-related decision, such as investment, due to its possible impact on their family's financial situation.

This fact holds even truer considering that a number of the subject in this study consists of those above 25 years of age, so it is safe to assume that most of them are preparing or even already have a family of their own, thus making them shoulder the well-being of not only themselves but also their families. This finding is consistent with Lutfi [23] who have displayed how investment actors with family will take into consideration their family's condition when making an investment decision, therefore making them more cautious and tend to prefer a more stable investment choice.

The addition of family member also helps investment actors to be more selective and wiser in managing their finance, as evidenced in the assessment of H2a. The well-ordered actions in financial management as result of their responsibility towards their family members aren't limited to adult investment actors only, as younger investment actors have also shown a tendency to manage their own money, it is merely that it will become more dominant as they have a family of their own. However, this goes against the findings of Potrich et al. [24] which stated that the presence of dependent family member would make it less likely for individuals to be highly literated. This contradiction may be due to the fact that previous study used measurement of financial knowledge that required respondents to answer technical calculation questions, whereas the measurement here discussed more of their behavior and to what degree they agree with the statements given. Thus, their responsibility towards their ever-expanding family will make investment actors more inclined to be mindful of how they use and manage their money.

On the other hand, that same responsibility will make investment actors tend to be more confident in their personal skills and judgements. This can be seen from the assessment of H2b, which shows that investment actors with more family members displayed a tendency towards overconfidence bias. Baker et al. [7] have stated how overconfidence may be one of the most established psychological factors in regards of an investment actor's behavior and how overconfident investment actors tends to believe that they can influence the results of their decision due to their superior expertise in investing, so it can be posited that investment actors, especially those who have already started their own family, will be conditioned to make decisions based on their own knowledge and judgement due to their position as breadwinner in the family, thus making them more inclined to believe in their own calls more so than other's. If this is added with the fact that they do see a profitable result from their decisions from time to time, the more faith they will have on their decision-making skills.

Next, in regards with the investment decision themselves, it has been proven through the assessment of H3a that financial literacy have a positive effect, that is the real actions one would take daily in managing their finance will help them to be more adept in assessing situation and making a decision in an investment setting. Because they are used to managing their money, investment actors will know better when they should put or hold off their money and apply that to their decision-making. Sivaramakrishnan et al. [16] have shown how financial literacy plays an important role as Perceived Behavioral Control in giving a sense of self-efficacy that makes an investment actor believe that they are able to go through with their decision. In addition, Arianti [25] have also shown that when gauged separately, financial behavior would have a more significant impact on investment decision than financial knowledge.

On the other hand, assessment of H3b stated that bias such as overconfidence will have a positive, not negative, impact on investment decision. This result can be explained by the fact that measurement of overconfidence in this study are interpreted as a form of normal self-confidence rather than a harmful bias. The respondents of this study indeed show tendency towards overconfidence bias, but that confidence is still in a reasonable level, which causes it to still be helpful in giving investment actors the courage they needed to make an investment decision. However, whether that decision is a "good" one or not is a matter that hasn't been touched upon in this opportunity. Previous studies such as Pradhana [26] and Tanusdjaja [27] have shown similar results in which overconfidence allow investment actors to be more confident in making investment decisions. Therefore, what needs to be checked is how to maintain that self-confidence in a beneficial level rather than harmful due to causing investment actors to take reckless risks.

The next part addresses the indirect effect of demographic factors on investment decisions through two different variables. First of all, it is regrettably found from assessment of H4a that financial literacy is unable to mediate the relationship in a statistically significant way. This indicates that an investment actor's behavior in managing their financial situation holds a separate role in

relation with the decision they make for their family. Or, rather, their responsibility is already enough to drive them to take a more critical action in making a decision, so their financial behavior is deemed irrelevant in the relationship. Fachrudin and Fachrudin [19] themselves have went and showed how financial literacy is needed as mediator so that an investment actor's education and experience can have a significant effect on their investment decision. However, the demographic factors discussed here is the addition of family members.

Meanwhile, behavioral bias is found to be a significant mediator, as seen in H4b assessment. This means that the increasing number of family member will put investment actors in a position where they need to be able to make a decision independently, thus they have to possess faith in their personal aptitude. Behavioral bias in the form of overconfidence helps investor in making an investment decision, as it conditioned them to be braver and more confident that the decision they take is indeed fruitful. This goes in line with the findings of Metawa et al. [9] in which it was shown that behavioral bias is able to mediate the relationship between demographic factors and investment decision, but they also took to raise attention on the danger overconfidence poses as they can cause investment actors to underestimate and take too much risks in investing.

## 5. CONCLUSION

Based on the results discussed previously, it can be concluded that the increase in family member will render investment actors responsible for the well-being of their family, therefore motivating them to be more critical in making an investment decision. Similarly, this responsibility will lead to the improvement of their financial management skill as well as their self-confidence. Investment actors who are used to taking care of their financial situation and therefore more adept in deciding whether their current finance is able to support the investment decision they are about to make. Their high level of self-confidence will also help them to have courage in the decision they take. However, in evaluating the mediating capability of financial literacy and behavioral bias, it is found that only overconfidence can mediate the relationship between demographic factors and investment decision in a significant way.

Further research should take care to collect a larger amount of sample from respondents who are more specialized in investment or finance, so to enable all of the indicators in the study to be used maximally. Other than that, it is also prudent to set a specific set of criteria of what makes a "good" investment decision, so that the next study will be able to measure the quality of the decision an investment actor made as consequences of the factors affecting said decision. Finally, the exploration of the relationship between financial literacy and behavioral bias can be another novelty for future research, that is observing whether financial literacy is able to mitigate the negative effects behavioral biases has on investment decision, so as to help investment actors make a more successful investment.

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