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Impact of financial literacy and financial behavior on investment among millennial in Indonesia: the moderating role of risk profile

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Abstract. This study aims to provide empirical evidence of millennials' investment behaviors, considering their risk profiles as a moderating factor. It also explores the financial literacy and behaviors of millennials. Predictions from the Central Bureau of Statistics (Badan Pusat Statistik/BPS) suggest that millennials will form the majority in Indonesia's demographic structure, thereby shaping the country's future. The study involved 168 millennials, recruited through convenience sampling, with data collection occurring in June-July 2021. The data was analyzed using exploratory factor analysis and a structural equation model, revealing that financial literacy and behavior significantly and positively impact investing; however, while risk profile moderation affects financial literacy, it does not moderate financial behavior. The study faced limitations, including a sample size of 168 respondents—barely meeting the minimum requirements for SEM analysis—and the geographic limitation of respondents being from Palembang city. Future studies are recommended to explore a broader region with a larger sample size to enhance understanding of the moderating effect of risk profiles in financial planning.
Keywords: *Financial literacy, Financial behavior, Investment, Millennial, Risk profile*

1. Introduction

In the Financial Literacy Index among Asian countries such as the Philippines, Singapore, and Malaysia, Indonesia remains in a relatively low position. In Malaysia, 60-73% of the population, and in Singapore, up to 98%, demonstrate an understanding of financial literacy, according to the OECD in 2021. The Indonesian government, through the Financial Services Authority (Otoritas Jasa Keuangan/OJK), reported a financial literacy rate of 21.84% in 2013, which increased to 29.7% in 2016, and further rose to 38.03% in 2019. The 2019 Indonesia Millennial Report survey (IDN Research Institute, 2019) revealed that only 10.7% of earned income was saved, while 51.1% was spent on monthly needs and an additional 8% on entertainment. The interest of millennials in investing is notably low, at just 2%. The IDN Research Institute categorizes millennials into two groups: Junior Millennials, born between 1991 and 1998, and Senior Millennials, born between 1983 and 1990. According to this categorization, the millennial population aged 20-35 constitutes 24%, or 63.4 million, of the population in the productive age category (14-64 years), totaling 179.1 million people (67.6%). This significant demographic is poised to significantly influence

Indonesia's future. The tendency of millennials to invest only 2% of their income, with the majority spent on monthly needs and spending, highlights a critical area for financial education and empowerment.

Empirical evidence regarding individuals' behavior in financial management, including the optimization of asset allocation or income, continues to be debated in financial research, particularly within personal finance, which examines the behaviors of individuals or households. Numerous studies have focused on financial literacy and investment behaviors, involving participants from various demographics, including students (Alwi *et al.*, 2015; Gutter & Copur, 2011; Norvilitis & Maclean, 2010; Philippas & Avdoulas, 2019; Zulfaris *et al.*, 2020), undergraduates (Sukma & Pradana, 2022), employees (Damayanti & Wicaksana, 2021; Sabri & Falahati, 2013; Kamakia *et al.*, 2017; Mohamed, 2017; Netemeyer *et al.*, 2018), and housewives (Mohamed, 2017; Zhao and Zhang, 2020). These findings present a range of perspectives, underscoring the need for ongoing research due to the persisting controversies. A notable gap in previous researches is the incorporation of the risk profile factor, as individual preferences in risk-taking significantly influence asset or investment allocation decisions. Although there are a limited number of studies examining the role of the risk profile as a predictor of financial behavior (Damayanti & Wicaksana, 2021; Dewi & Arlian, 2020), indicating interactions between risk preferences and financial literacy, the evidence suggests that enhancing financial literacy can profoundly affect an individual's financial behavior in terms of investing. Specifically, improved financial literacy is associated with better financial behavior (Andarsari & Ningtyas, 2019b; Garg & Singh, 2018; Lajuni *et al.*, 2018).

In the Financial Literacy Index of Asian countries such as the Philippines, Singapore, and Malaysia, Indonesia still occupies a low position. In Malaysia, 60-73% of the population, and in Singapore as much as 98%, already have an understanding of financial literacy, according to the OECD in 2021. The Indonesian government, through the Financial Services Authority (Otoritas Jasa Keuangan/OJK), reported a financial literacy rate of 21.84% in 2013, which increased to 29.7% in 2016, and further rose to 38.03% in 2019. The 2019 Indonesia Millennial Report survey by the IDN Research Institute revealed that only 10.7% of income was saved, while 51.1% was spent on monthly needs and another 8% on entertainment. The interest of millennials in investing is very low, at only 2%. The IDN Research Institute categorizes the millennial generation into two groups: Junior Millennials, born between 1991 and 1998, and Senior Millennials, born between 1983 and 1990. According to this age group, the millennial population aged 20-35 reached 24%, namely 63.4 million of the population in the productive age category (14-64 years), which totals 179.1 million people (67.6%). This significant demographic is considered the foundation that will determine the future of Indonesia.

Empirical evidence regarding individuals' behavior in financial management, asset allocation optimization, or income remains a topic of debate in financial research, especially in personal finance, which examines the behavior of individuals or households. Many previous studies have observed behavior concerning financial literacy and investment among research subjects including students (Alwi, *et al.*, 2015; Gutter & Copur, 2011; Norvilitis & Maclean, 2010; Philippas & Avdoulas, 2019; Zulfaris *et al.*, 2020), undergraduates (Sukma & Pradana, 2022), employees (Damayanti & Wicaksana, 2021; Sabri & Falahati, 2013; Kamakia *et al.*, 2017; Mohamed, 2017; Netemeyer *et al.*, 2018), and housewives (Mohamed, 2017; Zhao and Zhang, 2020). The findings continue to show controversy, highlighting the need for ongoing research.

A limitation of several previous studies is the inclusion of the risk profile factor, as individuals' asset or investment allocation decisions tend to vary based on their risk-taking preferences. However, there are only a few studies on the role of the risk profile as a

predictor (Damayanti & Wicaksana, 2021; Dewi & Arlian, 2020), despite the interaction between risk preferences and financial literacy. Improved financial literacy can significantly influence an individual's financial behavior in investing. The better a person's financial literacy, the more significant its impact on financial behavior (Andarsari & Ningtyas, 2019; Garg & Singh, 2018; Lajuni *et al.*, 2018).

However, the financial behavior towards investing, with particular attention to the risk profile, has not been extensively explored by researchers in the field of personal finance. Thus, the novelty of this research lies in examining variables previously less studied within the context of the relationship between financial literacy, financial behavior, investment, and the moderating role of risk profiles, specifically targeting the millennial generation as research participants. Theoretically, this research aims to contribute to the Theory of Planned Behavior (TPB), which associates beliefs with an individual's behavior, particularly millennials', in terms of financial literacy and financial behavior towards investment. This investigation is influenced by considering the risk profiles of millennials. Practically, this research is expected to serve as a valuable resource for millennials to make informed investment decisions, highlighting the importance of understanding both financial literacy and financial behavior.

Investments can be categorized into two main types: investments in real assets, such as tangible fixed assets including property, physical precious metals, and antiques, and investments in financial assets, which are documents or letters representing indirect claims from the owner against the real assets of the issuer. Financial assets include deposits, mutual funds, bonds, digital precious metals, equity crowdfunding, and cryptocurrencies. Several empirical studies have shown that an individual's investment decisions are influenced by their financial literacy (Baihaqqy *et al.*, 2020; Gupta *et al.*, 2018; Hamza and Arif, 2019; Kumari, 2020). Sharma (2020) investigated the theoretical model of financial literacy and investment decision-making, suggesting that investors' approach can be categorized by their motivation for security, rather than seeking higher returns. Empirical findings in Indonesia (Senda *et al.*, 2020) with 29 ASN employees in Yogyakarta as respondents demonstrated that financial literacy, when adjusted for demographic factors, significantly impacts investment decisions. Further research conducted in Sri Lanka in 2020 using statistical analysis with the SEM approach found a significant positive relationship between financial literacy and investment decisions. Based on the preceding discussion, the hypothesis is formulated as follows:

H_1 - Financial literacy has a significant impact on investing

The development of measuring responses and reactions to behavior led to the Theory of Reasoned Action (TRA), proposed by Fishbein and Ajzen in 1977. The Theory of Planned Behavior (TPB) elaborates on this by incorporating three components of an individual's behavior: attitudes, subjective norms, and perceived behavioral control, which together shape behavioral intentions (Ajzen, 1991). This theory has been specifically utilized to assess individual behaviors and has found applications across various fields such as advertising, public relations, management, sports, and sustainability.

In this study, the TPB suggests that an individual's investment decisions are influenced by their financial behavior. This attitude towards behavior is shaped by their knowledge of finance and understanding of financial management, serving as the foundation for making investment decisions. Metawa *et al.* (2019) gathered data through a survey of 384 local investors in Egypt, revealing that behavioral factors significantly impact investment decisions. These findings underscore the considerable effect of behavioral factors, including sentiment, overconfidence, overreaction, underreaction, and herd behavior, on investment decisions. Asmara and Trimeiningrum (2020) conducted research on employees of the Herbal Pharmaceutical Industry of Sido Muncul Tbk in Semarang City with 108 respondents. Their

findings indicated that financial management behavior has a positive and significant effect on the investment decisions of employees. A similar study by Arianti (2018) involving 29,231 students found that financial behavior influences investment decisions. Additionally, research on 200 millennial respondents in Surabaya (Sukma & Pradana, 2022) demonstrated that financial behavior affects financial satisfaction. Reflecting on the previous discussion, the hypothesis formulated is:

H2 - financial behavior has a significant impact on investing

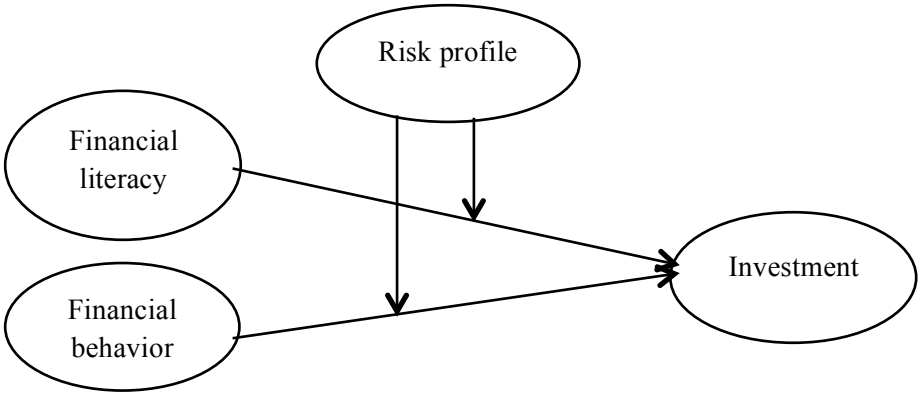
Every life lived today carries risks. According to Ademola *et al.* (2019), three important elements are considered as constituting risks: First, risk is a form of event; second, the event is still a possibility that can either occur or not; and third, if it occurs, it will result in a loss. Based on these elements, it can be concluded that the concept of risk involves events, possibilities, and losses. This is also true for the risks inherent in everyone's investment decisions. Several previous studies have described risk using terms such as risk preference (Asmara *et al.*, 2020; Garg & Singh, 2018; Younas *et al.*, 2019), risk tolerance (Adielyani & Mawardi, 2020), and risk diversification (Dangol & Maharjan, 2018). This study adopts the term "risk profile" as the observed variable. An individual's risk profile is related to their tolerance for risk or the extent to which they can bear risk (Damayanti & Zakarias, 2020). An investor's risk profile is determined by considering several factors, including their personal financial situation and conditions, investment experience, risk tolerance, investment time horizon, and investment objectives (Bortoli, Jr., Goulart, & Campara, 2019). Therefore, it is crucial for each person to understand and know their own risk profile, as it will directly relate to investment decisions when choosing suitable investment instruments, guided by individual characteristics.

The risk profile reflects the type of investor (Saraswati & Wirakusuma, 2018). There are five types, namely: conservative, moderate, developing, aggressive, and speculative. The development of these five types of investors is grouped into three categories: conservative, moderate, and aggressive (Barthel & Lei, 2021). Conservative investors are those who tend to avoid risk and prefer safe and low-risk investment instruments. Moderate investors are those who have a higher level of risk tolerance and expect commensurate returns. Aggressive investors are characterized by a high level of risk tolerance, adhering to the principle of high-risk, high return, and in extreme cases, can become speculators. Saraswati & Wirakusuma (2012) conducted a study on the risk profiles of investors and their interest in investments among 121 students of FEB Udayana Bali. They used the absolute difference test for the moderating variable of investment understanding, which was found to strengthen the relationship between investor risk and investment interest. Dewi & Arlian (2020) tested the relationship between financial literacy and the risk profile of 535 students, finding that financial literacy and risk profile have a strong relationship. Based on the explanation above, the following two hypotheses are formulated:

H3 - Risk profile has a significant moderation impact on the relationship between financial literacy and investing.

H4 - Risk profile will have a significant moderation impact on the relationship between financial behavior and investing.

Figure 1. Research Model Framework



According to Figure 1, strong financial literacy significantly impacts the investment choices of millennials. Similarly, financial behaviors are crucial to how millennials approach investing. A key element in making investment decisions is the risk profile, which varies among individuals. This variation in risk tolerance leads to distinct investment decisions and, consequently, diverse portfolio compositions.

2. Methodology

For this study, participants were selected through a strategy that combined simple random sampling with specific criteria targeting the millennial generation, defined as individuals born in the 1980s and 1990s, who are employed in the city of Palembang. Out of the targeted population, 168 respondents agreed to complete the online surveys, which were administered via Google Forms, from June to July 2021.

In this study, three variables related to investment were defined: financial literacy, financial behavior, and risk profile. Each variable was measured using modifications from questionnaires established in previous research. Table 1 defines the operationalized variables. The assessment of financial literacy was grounded in the principles of financial planning as outlined by the Financial Planning Standards Board (FPSB) Indonesia, which includes four specific indicators (FPSB, 2013). These indicators were assessed using a five-point Likert scale, ranging from "not at all important" to "very important." Financial behavior was evaluated through the framework of the Theory of Planned Behavior (TPB), as proposed by Ajzen (1991), utilizing seven indicators. These indicators were also measured on a five-point Likert scale, from "never" to "always." The evaluation of the risk profile utilized a modified version of the individual financial risk assessment tool, incorporating five indicators based on the research by Garg & Singh (2018) and Younas *et al.* (2019). These indicators were measured using a five-point Likert scale, from "strongly disagree" to "strongly agree."

Validity and reliability tests were conducted before the main analysis. The SEM results indicate that the questionnaire items are valid and reliable, as the composite reliability (CR) values exceed 0.7 and the average variance extracted (AVE) values are above 0.5 (Bacon *et al.*, 1995; Hair *et al.*, 2017). A total of 168 responses were collected, and the characteristics of the respondents are detailed in Table 2.

Table 1. Definition of Variables

Variables	Indicators	Source
Financial Literacy	1. Emergency fund planning 2. Planning money in and money out 3. Manage debt 4. Education fund planning	FPSB, 2013
Financial Behavior	1. Saving routine 2. Save and invest at the beginning of the month at least 10% 3. Make a budget for expenses and spending 4. Do a price survey before shopping 5. Paying electricity, water, Wi-Fi bills on time 6. Pay off the credit card before the due date 7. Save shopping receipts	Ajzen (1991)
Risk Profile	1. Dare to bet 2. Courage to go bankrupt 3. Macroeconomic analysis 4. Safety is more important than return 5. It is more convenient to save money in a bank than having a Customer Fund Account (RDN)	Garg and Singh (2018); Younas *et al.* (2019)
Investment	1. Withhold consumption 2. Have short, medium, long term financial goals 3. Allocation of funds according to financial goals 4. Financial portfolio according to plan	Gupta *et al.*, 2018

3. Results

The study involved a total of 168 participants, with females accounting for 53.6% and males 46.4%. The participants' ages ranged from 25 to 40 years old, as shown in Table 2. The largest age group was those between 25 to 28 years, making up 44% of the participants, followed by those aged 33 to 36 years at 23.8%. In terms of education, participants' levels ranged from high school graduates/diplomas to doctoral degrees, detailed in Table 2. The majority of participants held a bachelor's degree (50%), with those holding a master’s degree comprising 38.7%. Regarding employment status, the largest group represented 59% of the participants, with online drivers and fashion/food stylists each making up 1.2%.

Table 2. Distribution Frequencies of Participants Profile

	Characteristics	Frequency	%
Sex	Male	78	46,4
	Female	90	53,6
Age	25 – 28	74	44,0
	29 – 32	27	16,1
	33 – 36	40	23,8
	37 – 40	27	16,1
Education	Doctoral degree	6	3,6
	Master degree	65	38,7
	Bachelor degree	84	50,0
	High School Graduate/Diploma	13	7,7
Employment status	Content creator	3	1,8
	Fashion/food stylist	2	1,2
	Social media strategies	4	2,3
	Driver online	2	1,2
	Instructor	58	34,5
	Others	99	59

The results of inferential statistics using SMART-PLS begin with testing the validity and reliability of the instrument used. The results of the research instrument testing are shown in Table 3:

Table 3. Testing the Measurement Model

Variables	Indicators	Loading factor-1	Loading Factor-2	Cronbach's Alpha	CR	AVE	Convergent Validity (Ave>0,5)
Financial Literacy	FL1	0,595	0,543	0,637	0,777	0,565	Valid
	FL2	0,860	0,898				
	FL3	0,302	-				
	FL4	0,762	0,736				
Financial Behavior	FB1	0,861	0,673	0,760	0,833	0,554	Valid
	FB2	0,686	0,686				
	FB3	0,737	0,747				
	FB4	0,604	0,604				
	FB5	0,690	0,714				
	FB6	0,604	0,609				
	FB7	0,420	-				
Risk Profile	RF1	0,651	0,771	0,641	0,798	0,569	Valid
	RF2	0,593	0,734				
	RF3	0,730	0,757				
	RF4	0,430	-				
	RF5	0,466	-				
Investment	INV1	0,535	0,524	0,803	0,872	0,638	Valid
	INV2	0,890	0,893				
	INV3	0,883	0,885				
	INV4	0,887	0,836				

Referring to Table 3 testing the model measurement by loading factor, there are several indicators that are dropped because they have an outer loading value of <0.5, namely FL on FL3, FB on FB7, RF on RF4 and RF5. The CR, AVE and Convergent Validity values are already valid. The discriminant validity test based on the cross loading value to determine the value of the construct can be seen in Table 4.

Table 4. Validity of Discriminant with Cross Loading

	Financial Literacy	Financial Behavior	Risk Profile	Investment
FL1	**0,742**	0,176	0,059	0,082
FL2	**0,899**	0,310	0,149	0,405
FL4	**0,735**	0,321	0,010	0,252
FB1	0,298	**0,772**	0,131	0,337
FB2	0,291	**0,865**	0,219	0,379
FB3	0,224	**0,747**	0,345	0,526
FB4	0,183	**0,805**	0,275	0,362
FB5	0,282	**0,714**	0,120	0,505
FB6	0,242	**0,708**	0,154	0,359
RF1	0,092	0,280	**0,772**	0,255
RF2	0,054	0,172	**0,735**	0,212
RF3	0,101	0,243	**0,756**	0,353
INV1	0,202	0,255	0,180	**0,891**
INV2	0,367	0,609	0,322	**0,883**
INV3	0,417	0,543	0,317	**0,837**
INV4	0,242	0,516	0,362	**0,882**

Figure 2. Structural model results

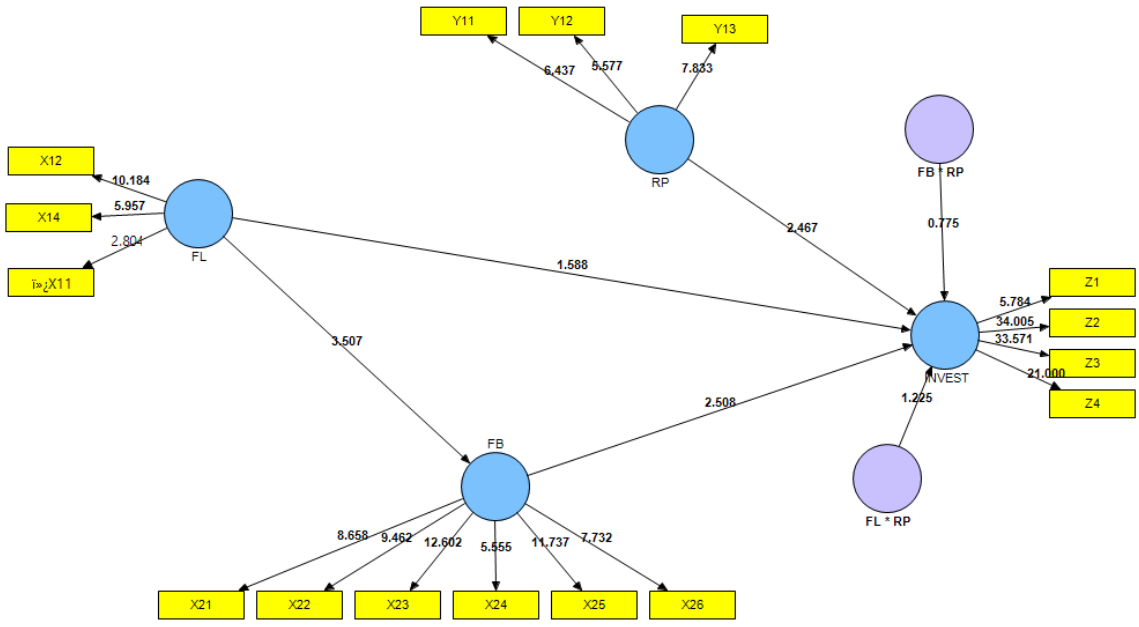


Table 5 Hypothesis Testing Results

	β	P value	Hypothesis	R^2
Financial Literacy ➔ Investment	0,621	0,011	Accepted H_1	
Financial Behavior ➔ Investment	0,757	0,002	Accepted H_2	0,503
Financial Literacy * Risk Profile ➔ Investment	-0,910	0,053	Accepted H_3	
Financial Behavior * Risk Profile ➔ Investment	-0,545	0,251	Reject H_4	

4. Discussion

Table 5 reveals a significant positive relationship between financial literacy and investment. This outcome suggests an improvement in millennials' financial knowledge, leading to increased investment activities (supporting Hypothesis 1). A key indicator of financial literacy in this context is the practice of managing funds, including planning for both income and expenses. Theoretically, in financial planning, the act of investing is often motivated by having a surplus in cash flow, as depicted in the hierarchy of financial planning. The practical aspect of managing these financial flows involves detailed tracking of all related income and expenditure. Given that millennials are part of Generation Z, a group known for its tech-savviness, leveraging digital tools for tracking finances is both feasible and efficient. This aligns with findings from previous research conducted by Cuanda (2020) and Senda *et al.* (2020), which also noted similar trends. Additionally, Table 5 illustrates the positive impact of financial behavior on investment among millennial respondents, supporting Hypothesis 2 with significant results. This outcome provides concrete evidence that millennials' approach to managing their finances, particularly through effective budgeting and expenditure planning, is improving. Such behaviors, which ultimately enhance investment, align with the Theory of Planned Behavior (TPB), suggesting that investment decisions are influenced by individuals' attitudes reflected through their financial actions. This premise is underpinned by the foundation of investing based on financial behavior, as discussed by Metawa *et al.* (2019), with similar findings noted by Indonesian researchers like Arianti (2018) and Asmara *et al.* (2020). Regarding Hypothesis 3, the study identified a moderating effect that diminishes the influence of financial literacy on investment, indicating a negative interaction between financial literacy and risk profile. This suggests that while financial literacy considers risk profiles in investment decisions, its effectiveness is lessened, potentially leading to reduced investment among millennials due to a conservative risk profile, contrasting with those holding an aggressive risk profile. This reinforces the concept that investment decisions are significantly affected by an individual's risk profile, which assesses their tolerance towards facing financial risks (Damayanti & Zakarias, 2020). Similar conclusions were observed in research conducted on bank employees in Bandung and students (Dewi & Arlian, 2020). However, the study could not empirically validate the moderating role of risk profile between financial behavior and investment, leading to the rejection of Hypothesis 4. The analysis, particularly focusing on the primary indicators "making budget and expenditure" for financial behavior and "macroeconomic analysis" for risk profile, revealed that considering macroeconomic factors in financial behavior does not significantly influence investment decisions. This is attributed to systematic risks, such as inflation, interest rate volatility, and market risks, which cannot be mitigated through diversification. This discrepancy from previous studies that utilized different methods for testing moderation, such as absolute difference instead of interaction, highlights the potential variability in outcomes based on the chosen methodological approach.

5. Conclusion

This study investigates investment decisions among millennials in the city of Palembang. The findings provide empirical evidence that financial literacy significantly affects investment decisions, and financial behavior has a considerable impact on investment. The research also explored the moderating role of the risk profile on the relationship between financial literacy and investment, finding it to be diminishing. However, the effect of risk profile moderation on investment is not significant, indicating a direct influence of financial behavior on investment decisions. These insights contribute to the expansion of literature on financial planning and personal financial management. Nonetheless, the study acknowledges certain limitations. Initially, participants were pre-screened with a question on their investment experience using a Google Form, revealing that 30% of those screened had not yet invested. Only those who had invested were prompted to complete the remainder of the questionnaire. Furthermore, this study suggests that future research could further explore enhancing financial literacy in Indonesia, following initiatives by the Financial Services Authority (OJK), with a continued focus on personal finance.

6. Acknowledgments

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