The Influence of Financial Literacy and Risk Perception on Investment Decisions Based on Gender using Multi-Group Analysis Methods

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Abstract

This study attempts to examine the influence of financial literacy and risk perception based on gender on working individuals consisting of the millennial and Z generations in Indonesia. A questionnaire-based survey was conducted using a purposive sampling technique. With a large population, the sample size was generated from Cochran's calculations with a significance level of 10%, resulting in 100 respondents for each gender group. A total of 211 responses were collected and the data was analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) and also Multi-group Analysis (PLS-MGA) to see the differences in the influence of each gender group. Considering the outcomes of the data analysis, this study demonstrates that there is a positive and significant influence of financial literacy on investment decisions. Likewise, risk perception has a positive and significant effect on investment decisions. And the influence of financial literacy and risk perception of each group, both men and women, has a positive and significant effect on investment decisions. Then, for the analysis of differences using MGA analysis it was also found that there were significant differences.

Keyword: financial literacy; risk perception; investment decisions; gender; PLS-MGA

1. Introduction

Financial planning is based on life cycle needs, and each person needs to plan, save, and invest to meet each of these needs. These needs start from how each person meets their primary needs, prepares emergency funds, builds a house, prepare savings for retirement, and invests in assets that will be useful in the future. To maximize the benefits of the various savings schemes applicable in the formal and informal economy, everyone must be informed about the products and their features. Also, everyone who invests should understand the risks and rewards of each investment option so they can ensure that their savings are stored safely.

Many generations of Z and millennials today often talk about the fear of missing Out (FOMO) and the fear of people's opinions (FOPO). Fear of missing out (FOMO) is when someone tries to imitate or follow someone else's behaviour and join the trend because they don't know what they want. Fear of not keeping up with trends can lead to impulsive behaviour in many things, including investing.

In addition, the FOMO phenomenon has also caused the BI Checking generation of young people in Indonesia to become bad. This is caused by their reluctance to follow popular fashion without considering their abilities or purchasing power. They experience economic pressure, consumer behaviour and unhealthy lifestyles. As a result, they seek funds in various ways, one of which is through online loans, which offer instant disbursement of funds. Younger generations such as millennials and generation Z ultimately become entangled in illegal online loans and are unable to pay existing debts, resulting in their own losses. One disadvantage is a poor BI Checking score, which will prevent them from getting jobs, scholarships and home loans. As recorded by the Financial Services Authority (OJK) in the Technology-Based Joint Funding Services Statistics data, outstanding individual loans are mostly shown in the age groups 19-34 years and 35-54 years, and are dominated by women.

With high investment interest in Indonesia, irresponsible people often become easy targets. One example is the case of binary options which started with invitations from influencers who post photos of glamorous lives and encourage affiliates to place their assets in certain investment instruments, who will then be trapped into gambling games that resemble investment trading. This causes many people to be tricked into putting tens of millions of their money without a clear promise of return, and in the end their money is lost and they suffer losses. Public losses of IDR 139.67 trillion resulted from illicit or fraudulent investments between 2017 and 2023, according to the Financial Services Authority (OJK).

Apart from the FOMO phenomenon and the rise of fraudulent investments, investments are chosen by individuals based on their motives, such as capital gains, dividends, tax protection, and so on. Overall, rational decision making requires technical knowledge and real-life experience. Insurance, mutual funds, stock markets, bank deposits, gold, real estate, and postal savings are some of the personal financial management tools that can make financial planning more effective according to (Bhargava et al., 2017).

It was recently discovered that the Indonesian financial market, including the Composite Stock Price Index (IHSG) and the rupiah, has recently moved negative or fallen to its lowest level in the last five months. The capital market is highly influenced by rising interest rates, and investors tend to choose investment instruments that offer higher returns than shares, such as bonds. Share prices decline when demand declines. However, because the yield is no longer attractive compared to the higher interest rates offered by new bonds, the value of bonds already in circulation also falls. Additionally, rising interest rates make borrowing more expensive for companies and individuals looking to borrow money. This can reduce investment and consumer spending, hindering economic growth and business performance.

This decline will definitely cause panic in the stock market, which will force investors to unload or sell their shares. Panic selling is a phenomenon where selling pressure increases, resulting in a decline in stock prices. This panic selling is caused by emotion and fear, not rational analysis. There are many legal investment options available, as well as carrying out thorough analysis before making a decision because you are carried away by emotions or influenced by other people's opinions.

Individual investment behaviour will be related to the choice of investment type to be chosen, this will also be related to the level or amount of income and also the level of financial knowledge of each individual in determining investment choices. Investors who are unfamiliar with finance may not be able to make good investment decisions. Investors' income level and experience may influence their investment decisions (Yusnita et al., 2022).

Factors such as age, gender, education, income, investment portfolio, etc. influence a person's investment decisions. The author will highlight the perspective of each gender in this matter. Gender and roles in financial decision making have become the subject of much research interest. Much research has been comprehensively collected on the influence of gender and roles in financial decision making. Both men and women usually have different ways and views about many things, such as investing.

Women's income is 23% less than men's, according to data gathered from a study by the Indonesian Central Bureau of Statistics for Labor Force data for the February 2020 period. This is consistent with the situation in Indonesia, where there is still a wage gap between men and women. This difference phenomenon can also ultimately affect the way each person, both men and women, plans, saves and invests for their future.

In order to make good investment decisions, one must also have a good understanding of finance. It is known that financial literacy is the degree to which an individual knows key financial concepts, is capable of handling their own finances with confidence, and is able to make wise short- and long-term financial decisions in addition to keeping track of current events and shifts in the economy.

Financial literacy can be very helpful in making decisions such as paying bills on time, managing debt properly, and influencing a person's personal financial management so that it can have a positive or negative impact. A person can manage finances well if they understand it. If they have good financial knowledge, they can plan safe and secure investments. Additionally, it reduces the chances of getting caught in fraudulent schemes and allows one to use financial goods and services more effectively.

In addition to the wage gap survey in Indonesia which was previously explained, we can see changes in the financial literacy index of people in Indonesia based on gender. The results of the 2022 National Financial Literacy and Index Survey show that women's financial literacy index is higher, at 50.33%, compared to men's financial literacy index of 49.05%, which shows an increase in people's financial literacy in Indonesia. This shows a significant increase in public financial literacy in Indonesia.

Even though the financial literacy index for women in Indonesia has increased compared to men, this does not yet show that women can dominate the investment market compared to men. According to data from the Indonesian Central Securities Depository (KSEI) from March 2024, the majority of recorded individual investors are men, 62.20%, with an asset value of IDR 1,150.28 trillion, and the remaining 37.80% are women, with asset value of IDR 225.38 trillion.

It is stated that men may have different ways of investing, and each can learn from each other. Financial experts believe that this is what differentiates men and women when it comes to money. Men and women differ in the way they invest. Men tend to make riskier investments, while women tend to make less risky investments (Singh Tomar et al., 2019).

Understanding that investment always involves risk, the only difference is whether the risk is large or small. In this way, people need to have a good understanding of the risks before making an investment decision, especially the younger generation, both men and women, in order to avoid being trapped by fraudulent investments, illegal online loans, and/or other illegal investments.

As mentioned above, what people really need to pay attention to before applying for a money loan is understanding the risks of illegal borrowing. One of the risks is the high interest offered by the company. This happens when compared to legal funding fintech, and this high interest will also increase the debtor's bill. And other risks of illegal borrowing, if the funds are not paid, can cause someone to be blacklisted by the credit service, because when applying for a loan, a person will be asked for a number of personal documents, so this will make it difficult for the debtor when planning to apply for a loan to an institution in the future. finance. Another risk of unpaid illegal loans is that someone could receive threats from debt collectors which can be quite disruptive to their personal life. Companies providing illegal lending services can also charge administration fees of up to 30% of the total funds borrowed and also the tenors offered tend to be shorter when compared to legal financial institutions. Another risk that needs to be known is that there is no protection from the OJK, where money lending service providers who are not registered with the OJK are free from supervision, so that the fund management process carried out by these companies tends to be non-transparent.

In Indonesia, there are still few people who use financial information before making decisions about certain purchases or investments. Investing does not always result in profits because there is always a chance of loss, or risk. Functionally, the higher the expected return, the higher the level of risk and vice versa. As research shows, each individual's risk perception contributes to the assessment of that risk.

Through risk perception, it shows how a person understands or assesses potential risks considering uncertain investment results. High risk-perception investors typically avoid allocating their capital to high-risk investment assets. Nevertheless, investors with a low-risk perception prefer to invest in investment assets that have a high risk (Chandra et al., 2023). Of course, the perception of risk in investing for each individual, both men and women, will be different. Previous research shows that men understand more about finances and prefer to take risks than women (Aren & Zengin, 2016). However, several studies also found a negative relationship between risk perception and investment decisions, namely research by Marcolin & Abraham (2006); Moore (2003); and Huston (2010). Meanwhile, some people find a positive relationship between risk perception and investment decisions such as Ameriks (2003); Lusardi & Mitchell (2007). Then research from (Pradikasari & Isbanah, 2018). In addition, according to research by Nekby, Thoursie, & Vahtrik (2007) the influence of risk perception on investment decisions was found to be insignificant and also by Crosan and Gneezy (2009) could not confirm the relationship between gender and risk taking and investment choices.

Further study is necessary to fill in the gaps in the existing literature on the exogenous variables of financial literacy and risk perception, the endogenous variables of investing decisions, and the moderating variable of gender. The unique aspect of this study is the quantitative analysis the author will do to demonstrate how risk perception and financial literacy affect investment decisions in both genders utilizing the Multi-Group Analysis approach.

2. Literature Review

2.1 *Grand Theory Behavioral Finance*

Behavioral finance shows that emotions and other elements outside a person's personal control influence their financial behavior. The focus of the discipline of psychology and economics known as behavioral finance is to provide an explanation for the illogical and irrational choices that people can make regarding borrowing, saving, investing, and spending their money. Consequently, it can be said that psychological factors or outside forces have an impact on an individual's financial conduct (Ardhiani & Panjaitan, 2023).

In addition, individual financial behavior also includes how a person manages their financial resources, such as determining the amount of money to set aside for working capital and when to retire. Therefore, every aspect of financial planning and spending, as well as personal financial behavior, is influenced by financial literacy. Understanding and ability to calculate people's finances is needed to carry out these calculations (Munawar, 2023).

This behavioral finance theory also emphasizes how cognitive biases, such as overconfidence, loss aversion, and herd mentality, influence investors' decision-making processes, which can lead to illogical investment choices. Risk perception is an important component in investment decision making. This relates to the way people view and evaluate the level of risk associated with an investment (Almansour et al., 2023).

2.2 Investment Decisions

Hidayat & Pamungkas (2022) define investment decisions as investors' decisions to invest their capital by putting specific money into investment products after considering many things and their experiences. Investment decisions relating to the long term must be viewed from a time perspective. Therefore, every investment decision must be thought through thoroughly (Hidayat & Pamungkas, 2022).

Chandra et al. (2023) mentioned that metrics used to measure investment decisions include investment security, risk factor components, investment income, investment growth, and liquidity, as shown in the following table:

Table 2.1 Measuring Investment Decisions

Measurements	Explanations
Investment security	Investment security measurements indicate minimal risk of loss.
Risk factor component	The predictability of risk factor components associated with a particular investment that changes over time.
Investment income	Predictability of fixed cash income from an investment.
Investment growth	Understanding investment growth by analysing the increase in investment value over time.
Investment liquidity	Analyse whether the liquidity of an investment is high or low.

Source: (Chandra et al., 2023)

2.3 Financial Literacy

Azib et al. (2022) states that financial literacy is a person's ability to understand and do things about money, such as savings, loans, insurance, investments, and planning, so that they can manage their money well and make good decisions about them (Azib et al., 2022).

According to Zaibet (2021), financial literacy is the capacity to grasp and apply financial risk concepts, as well as the knowledge, drive, and self-assurance to do so in order to make wise decisions in a variety of financial situations, thereby enhancing societal and individual financial well-being and promoting economic participation. In addition, financial literacy is also defined as the ability to read, analyze, manage, and communicate about personnel financial conditions that affect material well-being, including the ability to differentiate financial options, discuss money and financial issues, plan for the future, and respond competently to life events that occur. influence everyday financial decisions, including events in the general economy (Zaibet, 2021).

In research by Susanti A., et al. (2023) stated that financial literacy measurement indicators consist of:

a) *Basic financial knowledge*;
b) *Loans*;
c) *Savings*;
d) *Investment*; dan
e) *Emergency fund* (Susanti et al., 2023)

Additionally, this is consistent with a study by Hidayat et al. (2023) that measures using the same five indicators, namely: basic financial knowledge, insurance, investment, savings and loans (Hidayat et al., 2023).

2.4 Risk Perception

Risk perception can also be defined as knowledge about risk, an individual's view, or assessment of a risky situation. The assessment is based on a person's nature and mental state (Apriliani & Murtanto, 2023).

According to Herliana et al. (2023), risk perception is a process of investors' views, assessments and interpretations of the risk of an investment instrument, as well as the state of uncertainty faced when someone cannot predict the consequences of making an investment decision (Herliana et al., 2023).

Chandra et al. (2023) describes indicators to measure risk perception, namely unpredictable returns, the possibility of loss, portfolio diversification, and dependence on professional investment advice, as seen in the following table:

Tabel 2.2 Measurement of Risk Perception

Measurements	Explanations
Unpredictability of returns	The extent to which society views risky investments as producing unpredictable profits.
Chance for incurring a loss	Understanding that the higher the investment return, the greater the chance of experiencing losses.
Diversification of portfolios	An investor's level of portfolio diversification can affect their investment risk.
Dependence of professional investment advice	The need for professional investment advice to determine the best investment options.

Source: (Chandra et al., 2023)

2.5 Gender

Dewi et al. (2021) states that gender is the position, role, responsibility and class classification of men and women as determined by society based on the characteristics of women and men who are deemed worthy by the norms, customs and beliefs of society. Gender is also the characteristics, behavior, criteria and expectations related to the different roles that exist between men and women in the relevant culture (Dewi et al., 2021).

According to Larasati and Ayu (2020), gender is the differentiation of roles, functions and responsibilities between women and men which results from socio-cultural construction and can change according to developments over time. In addition, gender is a difference in sex that is created by men and women through a long socio-cultural process rather than due to biological differences or God's creation (Larasati & Ayu, 2020).

3. Hypothesis Development

3.1 Financial Literacy and Investment Decisions

Previous research which states that financial literacy has a positive and significant effect on investment decisions, including research with these results is in line with research conducted by Yulianto (2023) which found that financial literacy has a positive and significant effect on investment decisions. This positive influence shows that the more knowledge a person has about finances, the better their financial behavior. Because the respondent is an employee, the significant effect shows that the respondent has high financial knowledge. Employees must have knowledge and understanding of finance so that they have the motivation, confidence and skills to use their knowledge as well as understanding while making investment decisions. Studying finance can help you become more financially literate and engage in the economy. Based on the description above, the hypothesis put forward is:

H1: Financial literacy has a significant effect on investment decisions.

3.2 Risk Perception and Investment Decisions

Several previous studies stated that risk perception has a positive and significant effect on investment decisions, including research with these results in line with research conducted by Hidayat et al. (2023) who found that risk perception has a significant positive effect on investment decisions, meaning that as risk perception increases or decreases, investment decisions will increase or decrease. The findings of this study are in line with those of Chandra Chandra et al. (2023), which found that it significantly influences investment decisions. Based on the description above, the hypothesis put forward is:

H2: Perception of risk has a significant effect on investment decisions.

3.3 Financial Literacy on Investment Decisions is Moderated by Gender

Previous research stated that financial literacy between men and women influences investment decisions, including research with these results in line with research conducted by Munir, Yue, Ijaz, Zaidi, and Hussain (2018) explaining that the relationship between financial literacy and decisions investment is moderated by gender. Additionally, they discovered that men and women view investments from different perspectives. Compared to women, men who understand financial literacy better have a tendency to invest more. This is in line with research from Adil, Singh, Ansari (2021) which revealed that financial literacy has a significant impact on the investment choices of male and female investors. However, there are contradictions with the results of research conducted by Pertiwi et al. (2020) that financial knowledge is not significant in investment decision making using gender as a moderating variable. In other words, male and female genders do not have different perceptions about decision making in relation to their background knowledge. Based on the description above, the hypothesis put forward is:

H3: Financial literacy has a significant influence on investment decisions in the male group.
H4: Financial literacy has a significant influence on investment decisions in the female group.
H5: There are significant differences between male and female in the influence of financial literacy on investment decisions.

3.4 Risk Perception on Investment Decisions is Moderated by Gender

Previous research stated that risk perception between men and women influences investment decisions, including research where these results are in line with research conducted by Pant & Srivastava (2021) showing significant differences in factor scores because the p value is smaller than 0.05. The greatest benefits are felt by both sexes, and future security is the factor that least influences investors' decisions towards less risky instruments. And in research Canikli* & Aren (2019) found, however, that women prefer shares in pension funds more than men, according to their research. Most people agree that men are more risk-takers than women when there is no other evidence to support this claim. Men tend to take risks more than women because they are too confident. However, it could not confirm the relationship between gender and risk taking and investment choices. Based on the description above, the hypothesis put forward is:

H6: Risk perception has a significant influence on investment decisions in the male group.
H7: Perception of risk has a significant influence on investment decisions in the female group.
H8: There is a significant difference between male and female in the influence of risk perception on investment decisions.

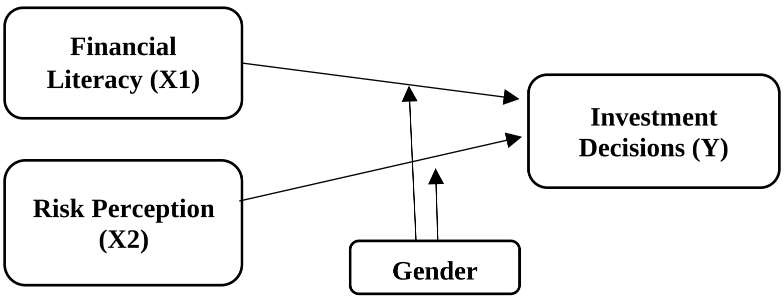

Figure 1. Research Model

4. Material and Method

In order to examine the relationship between the independent factors (financial literacy and risk perception) and the dependent variable (investment decisions), which are influenced by the moderating variable (gender), the author used a descriptive method. In this method, researchers have a great opportunity to test the relationships between variables, especially through cross-tabulation of respondents' answers to a number of items or questions in the questionnaire. Based on the results of research conducted on samples, researchers make generalizations about the population (Supratiknya, A., 2015).

In this research, the population refers to data from the Central Statistics Agency in the Indonesian National Labor Force Survey (Sakernas) for the period August 2023. The subjects of this research include individuals who work based on gender with a composition of male and female who come from millennials and Z generations. It consists of workers with birth years 1977-1994 and Generations.Research sampling was based on the Cochran formula as follows (Alim & Prabowo, 2023):

$$\mathbf{n} = \frac{z^2pq}{e^2}$$

where:
n = Number of samples
z = normal curve for a deviation of 5% with a fixed value of 1.96
p = true chance 50% = 0.5
q = false chance 50% = 0.5
e = Significance level 10% = 0.1

$$\mathbf{n} = \frac{(1.96)^2\,(0.5)\,(0.5)}{(0.1)^2} = \frac{0.9604}{0.01}$$

$$= \mathbf{96.04}$$

From the results above, a sample of 96.04 was obtained and rounded up to 100 for each group of male and female.

In this research, a Likert scale was used as an assessment instrument. The Likert scale is a tool used to measure how a person or group views, thinks, or has an opinion about social events or phenomena (Pranatawijaya et al., 2019). After the data was collected through a questionnaire, the author compiled the data in quantitative form by calculating the answer scores from the statements given by respondents, using certain criteria to provide scores.

Table 1 Skor Skala Likert

Answer	Score
Strongly Agree	5
Agree	4
Neutral	3
Disagree	2
Strongly Disagree	1

Source: (Pranatawijaya et al., 2019)

Table 2 Profile of Respondent

Characteristics	Number of Respondent	Percentage (%)
Gender:		
Male	105	49.8%
Female	106	50.2%
Age:		
14-19	0	0%
20-24	9	4%
25-29	46	22%
30-34	70	33%
35-39	51	24%
40-44	27	13%
45-49	8	4%
Total Respondent	**211**	**100%**

4.1 Design Study

In this research the author used a quantitative approach. In general, according to Creswell (2009), this type of quantitative research aims to test theory objectively by examining or researching the relationship between variables. These variables must be measurable so that the resulting numerical data can be analyzed statistically. In psychological research and other social research, demographic variables are also commonly used as intervention variables, moderator variables, and not as the main independent variables (Supratiknya, A., 2015).

This study employs a quantitative methodology to assess the influence of risk perception and financial literacy on gender-based investing decisions, taking into account the previously discussed backdrop and problem formulation.

4.2 Data Analysis

Average variance extracted (AVE) is the standard metric used to assess convergent validity at the construct level. When the AVE value is 0.50 or greater, it means that the construct accounts for more than half of the indicator's variance on average.In contrast, an AVE of less than 0.50 indicates that, on average, more error remains in the items than the variance explained by the construct.

Table 3 *Outer Loading Factor*

Variable	Indicator	*Outer Loading*	Category
Financial Literacy	FK1	0.756	VALID
CR: 0.928	FK2	0.725	VALID
CA: 0.917	FK3	0.704	VALID
AVE: 0.579	FB1	0.721	VALID
	FB2	0.797	VALID
	FB3	0.758	VALID
	FB4	0.785	VALID
	FB5	0.781	VALID
	FA1	0.704	VALID
	FA2	0.796	VALID
	FA3	0.792	VALID
	FA4	0.715	VALID
	FS1	0.777	VALID

	FS2	0.767	VALID
Risk Perception *CR: 0.924* *CA: 0.901* *AVE: 0.669*	RP1	0.721	VALID
	RP2	0.783	VALID
	RP3	0.783	VALID
	RP4	0.741	VALID
	RP5	0.749	VALID
	RP6	0.779	VALID
Investment Decisions *CR: 0.872* *CA: 0.829* *AVE: 0.596*	ID1	0.743	VALID
	ID2	0.771	VALID
	ID3	0.850	VALID
	ID4	0.849	VALID
	ID5	0.844	VALID
	ID6	0.823	VALID
	ID7	0.765	VALID

A variable can be declared reliable if it has a Cronbach's alpha value > 0.7 (minimum 0.70 or 0.60 in exploratory research; maximum 0.95 to avoid indicator redundancy which could endanger content validity; and 0.80 to 0.90 is recommended).

Table 4 Discriminant Validity *Fornell – Lacker Criterion*

	Financial Literacy	Risk Perception	Investment Decisions
Financial Literacy	0.892		
Risk Perception	0.774	0.818	
Investment Decisions	0.743	0.715	0.804

The results of the reliability test indicated the instruments' dependability. The results of Cronbach's Alpha and the composite dependability value indicated. Composite reliability is an indicator for measuring a construct that can be seen in the latent variable coefficients view. In this measurement, if the value achieved is > 0.70, it can be said that the construct has high reliability, while Cronbach's Alpha > 0.7 (minimum 0.70 or 0.60 in exploratory research; maximum 0.95 to avoid indicator redundancy that could compromise content validity; and 0.80 to 0.90 recommended). (see Table 6).

4.2.1 Common Method Biases Test

The Common Method Biases (CMB) test aims to avoid causes of error in data measurement or testing. One source of error in data measurement is method variance. The test's basic idea is to perform a factor analysis using all of the items from every study construct to see if there is a single common factor that can account for the bulk of the variance. The single factor test technique is used to show whether this issue exists or not. Where this research suggests that there is no single factor that explains more than 50% of the variance to indicate that CMB did not occur in this study. Common method biases, which may occur in survey data, were also examined using Harman's single factor test to reduce potential limitations associated with self-reported data. Kock (2021) also explains that generally the CMB test that is widely used is the highest full collinearity variance inflation factor (FCVIF) test, where the highest FCVIF in a model is compared to the usual threshold of 3.3 (Kock, 2021).

Table 5 ***Common Method Bias Test***

<u>**Inner model - Matrix**</u>			
	Financial Literacy	Risk Perception	Investment Decisions
Financial Literacy			2.497
Risk Perception			2.497
Investment Decisions			

Based on the results of the data analysis that has been carried out, the resulting VIF value is 2.497 < 3.3, hence CMB is not threatening in this study.

4.2.2 Partial Least Square – Structural Equation Modelling (PLS-SEM)

Smart PLS 4 software is utilized in this study for structural equation modelling (SEM). Using structural equation modelling (SEM), causal links are examined and the conceptual model is evaluated. There are three phases in PLS analysis, namely the measurement model phase (outer model), the structural model phase (inner model) and the hypothesis testing phase.

Hypothesis test

a) First Hypothesis Test (Partial Test/t-test)

The t-statistic value and probability value in a hypothesis test show this. The t-statistic value for alpha 10% is 1.645, which is the number used to test the hypothesis statistically. When the t-statistic is greater than 1.645, the hypothesis is considered rejected, and Ha is accepted. To reject/accept a hypothesis using probability, Ha is accepted if the p value is < 0.10.

b) Partial Least Square Moderation Hypothesis Test – Multi-group Analysis (PLS-MGA)

According to Hair et al. (2019), Multi-group Analysis (MGA) is a method that has been widely used for group comparisons. By utilizing MGA in the partial least squares structural equation model (PLS-MGA), researchers can analyze important variations in structural pathways among different groups (Cheah et al., 2023).

And to test the hypothesis, a comparison test is carried out between groups by looking at the *p*-value. It is also important to emphasize that the PLS-MGA approach only allows testing one-sided hypotheses. Specifically, Smart PLS software always tests the hypothesis that $p^{(1)}$ is greater than $p^{(2)}$. If we want to test the opposite direction (i.e., $p^{(2)} > p^{(1)}$), then we need to subtract the resulting p value from 1 to get the true p value for our hypothesis (Bouteraa et al., 2023).

Sarstedt et al. (2011) explains Partial Least Square – Multi-group Analysis (PLS-MGA) in detail, namely that this method is a non-parametric significance test for differences in specific group results that is built on the PLS-SEM bootstrap results. Results are significant at a probability of 10% of the error rate used, if the p-value is smaller than 0.10 ($p < 0.10$) or greater than 0.90 for a particular group difference path coefficient.

5. Result

This study's data analysis revealed that risk perception and financial literacy significantly influence investment decisions in a positive way. The path coefficients in the entire sample were 0.528 and 0.406, with a p-value of 0.000 (refer to table 2). It implies that, at a 10% significance level, the first hypothesis might be accepted.

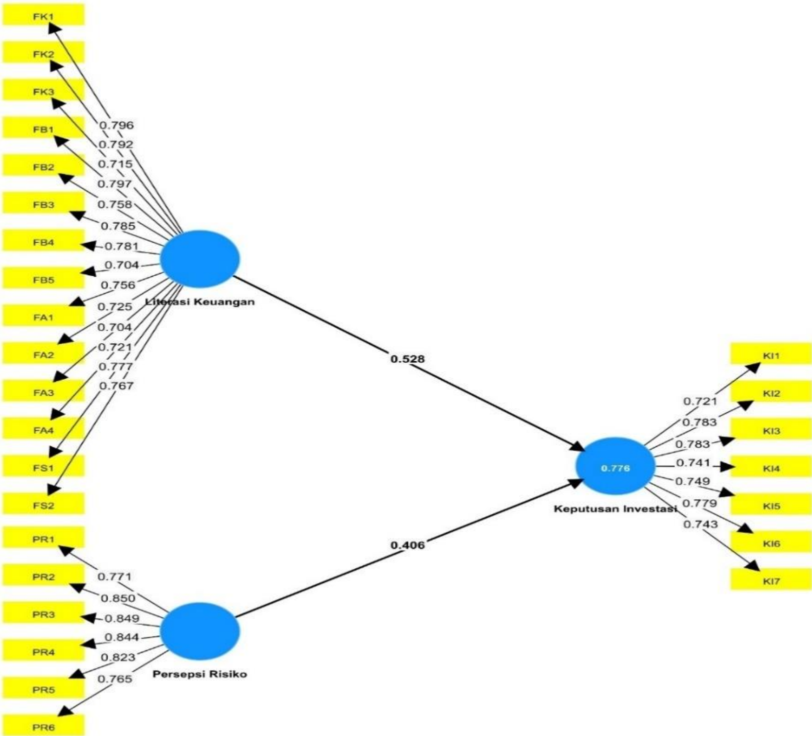

Figure 1. Conceptual Framework

To examine the impact of financial literacy and risk perception on investment decisions in each group of gender, the multigroup analysis is conducted by separating the sample into two groups.

Table 6 Reliability and Hypotheses Testing

		All	Group 1 (Male)	Group 2 (Female)
Latent Variables:				
Financial Literacy	Composite Reliability	0.928	0.938	0.909
	AVE	0.579	0.522	0.519
	Cronbach's Alpha	0.917	0.930	0.893
Risk Perception	Composite Reliability	0.924	0.932	0.914
	AVE	0.669	0.695	0.642
	Cronbach's Alpha	0.901	0.912	0.887
Investment Decisions	Composite Reliability	0.872	0.894	0.841
	AVE	0.596	0.549	0.535
	Cronbach's Alpha	0.829	0.861	0.780
Sample size (n)		211	105	106
Path coefficient:	FL → ID	0.528	0.423	0.643
	RP → ID	0.406	0.525	0.280
t-statistics:	FL → ID	6.190	3.975	6.240
	RP → ID	4.703	4.879	2.673
p-value	FL → ID	0.000	0.000	0.000
	RP → ID	0.000	0.000	0.008
R-square		0.702	0.808	0.748

The effects of risk perception and financial literacy on investment decisions in the male group were investigated under the third and fourth hypotheses. The findings demonstrated that financial literacy and risk perception have a favourable and significant influence on investing decisions. The hypothesis is significant at the 10% level of significance, as evidenced by the path coefficients of 0.423 and 0.525, t-statistics of 3.975 and 4.879, and p-value of 0.000.

Financial literacy and risk perception in relation to investment decisions were investigated in the female group under the fifth and sixth hypotheses. According to the findings, financial literacy and risk perception have a major positive influence on investing decisions. The hypothesis is significant at the 10% level of significance, as shown by the path coefficients of 0.643 and 0.280, the t-statistics of 6.240 and 2.673, and the p-values of 0.000 and 0.008.

In multi-group analysis, differences in path coefficients can be assessed using three criteria (Henseler, 2012): parametric tests with heteroscedasticity, parametric tests with homoscedasticity (assuming equal variances), and parametric testing with non-parametric PLS MG (Widyastuti & Soma, 2023). The results of a statistical test were shown in Table 7 in order to address the hypothesis regarding the variation in path coefficient across groups.

Table 7 Test of Difference based on Multi Group Analysis: Female vs Male

Female VS Male *(P – Values)*	Bootstrap MGA	Parametric test	Welch-Satterthwaite test
Financial Literacy → Investment Decisions	0.005	0.008	0.004
Risk Perception → Investment Decisions	0.001	0.000	0.001

Based on the results shown in the table above, information can be obtained that the p-values of the influence of Financial Literacy on Bootstrap MGA investment decisions are 0.005 < 0.1; Parametric Test of 0.008 < 0.1; Welch-Satterthwaite Test is 0.004 < 0.1. This means that there is a significant difference in the influence of financial literacy on investment decisions between women and men. In the meantime, the Welch-Satterthwaite test has a p-value of 0.001 < 0.1, the parametric test has a 0.000 < 0.1 value, and the impact of risk perception on Bootstrap MGA investing decisions has a p-value of 0.001 < 0.1. This means that there is a significant difference in the influence of risk perception on investment decisions between women and men.

6. Discussion

a) Financial Literacy and Investment Decisions

Investment decisions are influenced by financial literacy. It is crucial for someone to have a solid understanding of money management in order to prevent making mistakes when making financial decisions for both short- and long-term planning. It is evident from the questionnaire results that respondents typically possess greater financial knowledge when it comes to other financial competencies. One's investment decisions are significantly influenced by this financial information. A solid foundation in finance gives investors the ability to make more informed decisions, lower risk, and perhaps boost returns on their investments. Similarly, a person's financial attitudes enable them to base their investing choices on recommendations from acquaintances or media trends. Strong financial abilities can also help someone become more adept at managing their portfolio and making smart investment selections. This might give them long-term financial security and assist them in reaching their financial objectives. Moreover, the findings of Chandra et al. (2023), Utami & Sitanggang (2021), Rosdiana (2020), and Sumantri et al. (2024) are consistent with this research. This study, however, defies that of Senda et al. (2020), which found no relationship between financial literacy and investing choices. This implies that making an investment decision based solely on financial literacy level does not guarantee superior returns.

b) Risk Perception and Investment Decisions

Investment decisions are influenced by perceptions of risk. Perception of risk plays an equally significant part in financial decision making, including investing. According to Pratama et al. (2022), while making financial decisions, people with high-risk perception typically take their time and carefully analyse all available information. Overall, the evidence indicates that most respondents perceive risk positively and to a good extent. This study supports earlier research by Eko Harry Saputro & Lestari (2019), which found that investing decisions are positively impacted by risk perception. This demonstrates the significance of risk perception in human behavior, particularly when it comes to making decisions in ambiguous conditions. According to Chandra et al. (2023), Hidayat & Pamungkas (2022), Rosdiana (2020), and Cholifah et al. (2023), research indicates that risk perception has a major role in influencing investment decisions. These findings are consistent with each other.

c) Financial Literacy and Investment Decisions in Male Group

Investment decisions are influenced by financial literacy among men. Men are considered to approach investment differently than women. Men who possess a strong understanding of finance are more likely to make data-driven, logical investing decisions and to steer clear of rash or emotional choices that could deplete their portfolios. The analysis of questionnaire data for male respondents reveals a positive trend in all dimensions of financial literacy; however, only three indicators outperform the others: financial attitude (indicating that they maintain a personal budget); financial knowledge (indicating that they know how to use financial products and services); and financial skills (indicating that they know how to calculate returns on investments). This is consistent with research by Adil, Singh, and Ansari (2021) that found financial literacy significantly influences the investment decisions made by male investors, as well as research by Tri Herliana (2023).

d) Financial Literacy and Investment Decisions in Female Group

Investment decisions in women's groups are influenced by financial literacy. Women typically have lower levels of financial literacy than men, according to numerous studies, which may have an effect on their capacity to make wise and sensible investment decisions. The questionnaire data analysis revealed that, in comparison to the male group of respondents, the female group had a more positive inclination. The financial abilities indicator yielded positive outcomes for the female respondents. This result is consistent with study by Adil, Singh, and Ansari (2021), which found that both male and female investors' investing decisions are significantly influenced by financial literacy. In addition, the prior results show that the t value in the male group was 3.975, which was lower than the t value in the female group, which was 6.240. This is consistent with the findings of the Financial Services Authority's National Survey of Financial Literacy (SNLIK), which indicates that women's financial literacy has improved and grown relative to men's.

e) **Differences in Financial Literacy of Men and Women in Investment Decisions**
Men and women differ significantly in how much financial literacy influences their investment decisions. Well-educated men typically have more varied portfolios because they understand the value of diversification. Conversely, those with lower financial consciousness can be more drawn to high-risk ventures. This also holds true for women who understand the value of diversity and have strong financial literacy; these individuals typically exercise greater caution and distribute their portfolio across a range of assets in order to lower risk. The results of this study are in contrast to those of Canikli & Aren (2019), who found that while there is no significant difference in basic financial literacy between men and women, there is a significant difference in advanced financial literacy—that is, men score higher on the p-value than women. Similarly, Putra & Cipta's research from 2022 found that financial literacy has a positive and significant impact on investment decisions; however, the gender variable indicates that financial literacy has no effect on employee investment decisions and does not distinguish between decisions made by male and female employees.

f) **Risk Perception and Investment Decisions in Male Group**
Investment decisions are influenced by the male group's perception of risk. Numerous factors, including individual experiences, financial literacy, and prevailing market conditions, can impact this viewpoint. Men seem to have greater self-confidence in their capacity to recognize and control danger. Male respondents' questionnaire data analysis results indicate a good trend across all indicators. This is consistent with Singh Tomar's (2019) assertion that males typically select riskier investments. According to Aren & Zengin (2016), men are also more willing to take risks and have a greater understanding of finance than women.

g) **Risk Perception and Investment Decisions in Female Group**
Investment decisions are influenced by women's groups' perceptions of risk. The female group's view of risk has a more cautious and conservative impact on their investment decisions. According to Witra & Subriadi's research from 2021, women are seen to have a propensity to avoid taking chances. Similarly, women typically select less hazardous investments, according to Singh Tomar (2019). Furthermore, women prefer pension fund shares than do men, according to study by Canikli & Aren (2019). As a result, males are more prone than women to take risks when making investment decisions.

h) **Differences in Risk Perception of Men and Women in Investment Decisions**
The impact that risk perception has on investing decisions varies significantly between genders. This might be because of many psychological, social, and economic factors that affect how both groups assess and react to risk associated with money. Men typically take bigger chances, frequently with an excess of confidence, which can lead to both significant profits and losses. Women, on the other hand, are more likely to be conservative and careful when making investment decisions. This helps shield them from significant losses but also reduces their opportunity for big returns. By comprehending these distinctions, a more efficient and well-rounded investment plan for these two groups can be developed. The results of this study are also consistent with research by Pant & Srivastava (2021), which demonstrates that factor scores differ significantly and that both genders experience this difference most strongly when it comes to affecting investors' judgments to steer clear of riskier securities. Additionally, Canikli & Aren

(2019) discovered that men are more willing to accept risks than women, which is why women choose pension fund shares. This, however, runs counter to research by Violeta and Linawati (2019), who looked at how gender affected investing decisions and discovered that gender had a big impact. Rahman and Gan (2020) and Putri and Isbanah (2020) found the reverse, indicating that gender had no influence on investment decisions.

7. Conclusion, Implication, and Recommendation

This study aims to answer the impact of financial literacy and risk perception on investment decisions from the perspective of workers both male and female from young generations who will be investing their assets in several instrument tools. The research results show that financial literacy and risk perception have significant implications for investment decisions in the younger generation, both men and women. A deep understanding of both can help people better manage their investment portfolios, maximize profits and minimize losses. Additionally, inclusive education policies and programs can help young people become more financially prosperous.

To avoid falling into investments that are detrimental or fraudulent, it is a good idea for all individuals to equip themselves with knowledge and understanding of an investment before deciding what instrument is appropriate for saving assets or income, both in the short and long term. The government's role is also needed in designing a number of financial education programs tailored to meet the needs of men and women, addressing differences in knowledge about risk and financial literacy. Such education should include knowledge of real risks and risk management techniques, and help young people make good investment decisions and a healthy risk tolerance.

The researcher realized that in this research the sources and references directly related to the research used were lacking. Therefore, future researchers should increase the number of accurate sources and references related to the problems raised. Future researchers should be able to use other demographic factors, not just based on gender group. And also add accurate references and sources of information to support research both at home and abroad.

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