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Determinants of financial risk tolerance: Evidence from the Indonesian millennials

ID **Suherman Suherman**[1+]
ID **Herni Kurniawati**[2]
ID **Rosle Mohidin**[3]

[1]*Faculty of Economics, State University of Jakarta, Indonesia.*
Email: suherman@feunj.ac.id
[2]*Faculty of Economics and Business, Tarumanagara University, Jakarta, Indonesia.*
Email: hernik@fe.untar.ac.id
[3]*Faculty of Business, Economics and Accountancy, Universiti Malaysia Sabah, Malaysia.*
Email: awgdin@ums.edu.my

(+ Corresponding author)

ABSTRACT

The purpose of this study is to examine the level of Indonesian millennials' financial risk tolerance and the effect of gender, family occupation background, geographical location and financial literacy on financial risk tolerance. This research applies a quantitative approach using primary data that were collected through questionnaires. The sample used for this survey comprises 410 university students from western (Java, Sumatra, Kalimantan) and eastern (Bali, Nusa Tenggara, Sulawesi, Maluku, Papua) parts of Indonesia. The online survey was distributed to various universities in Indonesia. The one-way ANOVA and multiple regression methods were used for the analysis. The results show that: 1) the level of Indonesian millennials' risk tolerance is moderate, 2) the level of Indonesian millennials' financial risk tolerance is different, 3) gender, geographical location and financial literacy significantly affect the financial risk tolerance, and 4) family occupation background does not significantly affect the financial risk tolerance. These findings offer managerial insights into business practices in the financial industry to develop individualized investment portfolios based on investors' financial risk tolerance. In addition, financial advisors are recommended to offer relatively riskier financial products to millennials from West Indonesia and those with higher financial literacy.

Contribution/Originality: This study adds to the existing body of knowledge on the prospect theory and the entrepreneurship theory by providing empirical evidence on the relationship between gender and financial risk tolerance, geographical location and financial risk tolerance, financial literacy and financial risk tolerance, and family occupation background and financial risk tolerance.

1. INTRODUCTION

The behavioral economic theory states that humans are homo oeconomicus, whose behavior is identified as rational choice between various alternatives under the condition of scarcity. Rational people try to maximize utility and focus on self-interest, while any non-self-interested behavior is considered to be irrational (Goodwin, Harris, Nelson, Roach, & Torras, 2019). Nonetheless, Mathis and Steffen (2015) found that most people consider mutual benefits and fairness to be more important in an action instead of self-interest. Commonly, irrational economic behaviors occur in the area of personal finance. These behaviors can be influenced by past experiences as well as personal beliefs, which can further affect the way people perceive risk, and can identify an individual's risk tolerance. Rational investors expect a certain return with a smaller risk level or high returns with certain risks. The type of

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investment selected and the amount of funds invested are strongly influenced by investor tolerance to risk (risk tolerance). Bailey and Kinerson (2005) found that risk tolerance is a very strong predictor of investment decision making.

Financial risk tolerance is a topic that is currently being studied globally in terms of investor behavior. Financial risk tolerance is defined as the level of people's willingness to accept the maximum amount of uncertainty when making financial decisions (Grable, 2000). Roszkowski and Davey (2010) noted that the assessment of risk tolerance has been recognized as one of the prerequisites for investment firms in developing financial plans for clients. In some countries, the assessment of financial risk tolerance before making investment decisions is regulated by law, including in the United States. In other regions, assessing risk tolerance is considered to be the norm (Nobre, Grable, Da Silva, & Da Veiga, 2016). Furthermore, Linciano and Soccorso (2012) revealed that the assessment of financial risk tolerance can be an opportunity to increase efficiency and competitiveness for investment companies, since accurate assessment can build a solid relationship with clients. The evaluation of financial risk tolerance is generally done by collecting client information such as socio-demographic position, financial situation, investment objective, and investment holding period.

In the coming years, the majority of the world population will be constituted by the millennial generation. Millennials, those who were born between 1985 and 2000, have a global population over two billion, far more than Generation X and baby boomers, which amount to 1.4 billion and 1.2 billion, respectively (Goldman Sachs Asset Management, 2016). This means that millennials will soon replace baby boomers, who were once the engine of the economy, and will become the main participants in the financial markets. In the future, the increasing aggregate income of millennials will significantly affect the business and market. Moreover, according to a Standard Life report in 2014, 45% of millennials today are more interested in making investments compared to the millennials five years ago. There are many current studies that discuss the financial risk tolerance of baby boomers, e.g., Baek and Sharon (2004); Bellante and Green (2004); Gilliam, Chatterjee, and Zhu (2010); Glass Jr and Kilpatrick (1998) and Reisenwitz and Iyer (2007), but there is not much literature on millennials. Therefore, this study will fill the gap in the current literature by assessing the risk tolerance of millennials using survey-based research.

This study chose the Asian population, and Indonesia in particular, as the subject of the study since the most recent studies on financial risk tolerance were conducted in Western countries. Loc (2017) studied the risk profile of European students versus American students; Nobre et al. (2016) examined the financial behavior of Brazilians and Americans; and Bajtelsmit and Bernasek (2001) conducted a study on the risk preferences of older Americans. The study by Statman (2008) indicated that the propensities of risk tolerance are varied across countries due to cultural differences. The cross-cultural studies by Fan and Xiao (2006) and Hsee and Weber (1999) documented the differences in risk tolerance of Americans compared to Asians. Those living in collectivist societies, as in Asia, usually rely on financial assistance from governments, families and friends to reduce the financial risks associated with investments. For those living in communities with individuals who have more family members to provide for, like in the United States, the risks resulting from decisions are high, thus the burden of losses is also higher. Therefore, Asians are often more willing to accept risky investments.

Studies suggest that when evaluating risk tolerance, it is important to take factors that may influence investors' attitudes toward their risk tolerance into account. Some previous studies on risk tolerance have revealed numerous socioeconomic and demographic factors associated with shaping the risk tolerance of individuals. Factors that have been commonly studied in the previous research are gender, age, marital status, education, income, occupation, and geographical differences. Gender is the most widely examined factor of risk tolerance, and studies have revealed that males have a higher financial risk tolerance than females (Fan & Xiao, 2006; Grable, 2000; Hallahan, Faff, & McKenzie, 2004). Studies have also noted that the financial risk tolerance decreases with age (Fan & Xiao, 2006; Hallahan et al., 2004). For the marital status factor, studies found that financial risk tolerance is higher for single individuals (Grable & Joo, 1999; Hallahan et al., 2004). In addition, Grable and Joo (1999) and Yook and Everett (2003) found a significant

positive relationship between income and education and financial risk tolerance. Other factors will be discussed further since this study investigates millennials' risk tolerance based on the differences of gender, family occupation background, geographical differences and financial literacy.

The empirical findings of this study contribute both theoretically and managerially. The findings theoretically support the prospect theory in which gender, geographical location and financial literacy significantly affect the financial risk tolerance of Indonesian millennials. This study revises the entrepreneurship theory in which family occupation background does not significantly affect the financial risk tolerance of Indonesian millennials. The findings also offer managerial insight into business practices of the financial industry to develop individualized investment portfolios based on investors' financial risk tolerance. Finally, this study can help businesses in mapping the market preference on risk tolerance based on gender, geographical location and financial literacy.

The results seem to suggest that financial advisors should offer relatively riskier financial products to millennials from West Indonesia and millennials with higher financial literacy.

The rest of the paper is structured as follows: Section 2 reviews the literature and develops the hypotheses, Section 3 explains the research methods, Section 4 reports the results and the discussion, and Section 5 concludes the study and offers suggestions for future research.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1. Prospect Theory

The approach to financial management that studies the behavior of investors in making decisions is behavioral finance. In addition to economics theory, behavioral finance also involves the science of psychology. Psychological factors of investors are very influential in investment decisions. According to Lintner (1998), behavioral finance is a science that studies how humans interpret and act on information to make investment decisions. According to Shefrin (2005), behavioral finance is the science of how psychology affects finance. From the explanation above, behavioral finance can be defined as the study of how humans make investment decisions based on the information obtained. The continuation of behavioral finance is called prospect theory.

Prospect theory was developed by Kahneman and Theversky (1991). It explains how humans make decisions, and it notes the difference between attitudes toward risk when facing a profit or a loss. The level of loss is more prominent than the level of profit experienced by most people. The regret that arises from a loss is more pronounced than the satisfaction arising from profit, based on the assumption of the same level of loss and profit. In addition, Pujiyanto (2013) explains that the prospect theory is related to the idea that humans do not always behave rationally. Emotional involvement, likes, traits, various inherent behaviors and the influence of psychological factors have an influence on one's choice in cases of uncertainty.

2.2. Terminologies of Financial Risk Tolerance

According to Saputra and Anastasia (2013), risk is an uncertainty that can lead to undesirable loss. There are two types of risk, namely the known risk and the unknown risk. Known risk is a risk that the client can understand and predict and is willing to accept. Unknown risk is unexpected risk or outside of what they can understand. Behavioral problems often begin when a client experiences unknown risk (Pompian, 2016).

Financial risk tolerance is the maximum level of risk that a person is willing to tolerate when making a financial decision. There are some terms that have been mistakenly used to refer to risk tolerance, such as risk aversion, risk profile and risk preference. Risk aversion is the inverse of risk tolerance. Risk aversion measures the unwillingness of clients to accept risk in making financial decisions. According to Loc (2017), risk profile is the evaluation of the optimal level of risk that is related to the clients' traits. Risk preference, the term most often confused with risk tolerance, is a person's preference for risk alternatives and what a person is ranked on based on their risk preference.

Another term that is sometimes misleading is risk perception. Risk perception is a cognitive assessment of the risks implied in financial decisions that involve risk-related thinking and attraction in a decision.

According to Hallahan et al. (2004), risk tolerance is a person's attitude to accepting risk that is important for both financial service providers and consumers. Risk tolerance can help both parties to determine appropriate composition of the assets in the portfolio to optimize the risk and return relative to the needs of the individual (Hallahan et al., 2004). Schirripa and Tecotzky (2000) noted that pooling a group of investors with different risk tolerances into a single efficient portfolio could optimize the portfolio since it maintained the group's average risk tolerance. In contrast, the inability to determine an investor's risk tolerance will result in the homogeneity of the investment fund. Furthermore, if an investor's tolerance to such risks is ignored, then the planning and execution may cause difficulties due to risks that do not match the risk profile.

2.3. Hypotheses Development

2.3.1. Millennials' Level of Financial Risk Tolerance

Some millennials are extremely conservative and tend to be savers rather than investors. Millennials are worried about their parents' as well as their own financial health and future. Although millennials view themselves as risk tolerant, they hold fewer equities and a higher proportion of cash than older generations. Loc (2017), who studied the risk profile of European students versus American students, also confirmed that millennials tend to be risk averse because they have a low risk capacity and a low risk need. These studies indicate that the level of millennials' financial risk tolerance in Indonesia is assumed to be below the moderate level, either very conservative or conservative.

H1a: The level of Indonesian millennials' financial risk tolerance is conservative.

H1b: There is a significant difference between the level of Indonesian millennials' financial risk tolerance.

2.3.2. Gender

There are different behaviors between males and females in terms of risk taking in both personal affairs and managerial decisions (Birindelli, Chiappini, & Savioli, 2020; Suherman, Ramadhania, Ahmad, Zakaria, & Witiastuti, 2021a). Females are more risk averse and less confident when facing strategic choices (Ahmad et al., 2022; Buchdadi, Suherman, Mahfirah, Usman, & Kurniawati, 2023; Faccio, Marchica, & Mura, 2016). This makes women more cautious and less aggressive when making a decision compared to men (Byrnes, Miller, & Schafer, 1999; Suherman, Usman, Mahfirah, & Vesta, 2021b). A significant relationship between gender and financial risk tolerance was found in the study by Ardehali, Paradi, and Asmild (2005); Halek and Eisenhauer (2001); Nairn (2005) and Yao and Hanna (2005). Many literature reviews have clearly stated that men tend to be more risk tolerant than women (Ahmad et al., 2022; Ganegoda & Evans, 2014; Suherman et al., 2021a; Suherman et al., 2021b). Therefore, in this study, hypothesis two is proposed as follows:

H2: Gender significantly affects the financial risk tolerance of Indonesian millennials.

2.3.3. Family Occupation Background

Current studies examine financial risk tolerance based on occupation and frequently focus on self-employed and salaried individuals. Several studies, as cited in Karabulut (2016), noted that self-employed people take higher risks than other people. Moreover, only a few studies have examined the role of family occupation background (self-employed and non-self-employed) in affecting the financial risk tolerance of individuals. According to Fairlie and Robb (2007), individuals whose family background is entrepreneurial can have an impact on the development of their entrepreneurial actions. Research on entrepreneurial behavior conducted by Carr and Sequeira (2007) has shown that entrepreneurs often have a family background where their parents were self-employed (Carr & Sequeira, 2007). Brown, Dietrich, Ortiz Nunez, and Taylor (2007) studied self-employment and risk preference and found that the father's occupation has a significant relationship with an individual's risk preference. Furthermore, Skriabikova,

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Dohmen, and Kriechel (2014) noted that children of self-employed fathers are significantly more willing to take risks than children whose fathers are not self-employed. Therefore, hypothesis three is proposed as follows:

H3: Family occupation background significantly affects the financial risk tolerance of Indonesian millennials.

2.3.4. Geographical Location

Another factor that is assumed to affect financial risk tolerance is geographical location. Guiso, Sapienza, and Zingales (2004) investigated whether place of birth or place of residence have an influence on financial behavior and found that geographical location can affect risk tolerance. However, research conducted by Gustafsson and Omark (2015) did not find any significant effect of geographical location on financial risk tolerance. Since Indonesia is a country with a large territorial area and a large population, this study will also investigate whether geographical difference is one of the determinants of the level of risk tolerance. The scope of the research is divided into two, namely West Indonesia, which consists of Java, Sumatra, and Kalimantan, and East Indonesia, which consists of Bali, Nusa Tenggara, Sulawesi, Maluku, and Papua. According to the results of a survey conducted by OJK (Otoritas Jasa Keuangan) (2017), the level of financial literacy among Indonesian people in West Indonesia is an average of 31.56%, while the average financial literacy of people in East Indonesia is only 26.01%. Regarding financial inclusion, West Indonesia reached a figure of 69.44%, while East Indonesia's figure is 65.06%. The percentage differences in financial literacy and financial inclusion are thought to cause a difference in risk tolerance between millennials in those regions. Barsky, Juster, Kimball, and Shapiro (1997) noted that there is a significant difference in the financial risk tolerance of individuals residing in the western United States compared to any other part of the country. Furthermore, the study by Bonin, Constant, Tatsiramos, and Zimmermann (2009), which compared immigrants and natives in Germany, found that there is a difference in the level of financial risk tolerance between the two groups which is caused by cultural differences. Thus, hypothesis four is proposed as follows:

H4: Geographical location significantly affects the financial risk tolerance of Indonesian millennials.

2.3.5. Financial Literacy

The evaluation of financial risk tolerance will be very helpful in understanding individuals' investment behavior, especially when making decisions. Financial literacy is believed to contribute to determining financial risk behavior rather than socio-demographic factors. Studies have suggested that financial literacy has a significant effect on risk tolerance and affects investment decisions. Huhmann and McQuitty (2009) noted that when an individual receives more information, their financial literacy score and total risk score increase. Research conducted by Swedish university students found that students who have higher financial literacy tend to take higher risks (Sjöberg & Engelberg, 2009). Simultaneously, other studies state that financial literacy could have a direct effect on an individual's investment decisions (Al-Tamimi & Kalli, 2009; Jappelli & Padula, 2013). Financially literate investors use different criteria when making investment decisions, such as financial publications. Meanwhile, low literacy investors commonly make investment decisions based on advice from family, friends and stockbrokers. Financial literacy is a topic that is often discussed since various studies have revealed that it can affect financial risk tolerance (Gustafsson & Omark, 2015; Hallahan et al., 2004; Ryack, 2011; Yao, Sharpe, & Wang, 2011). Furthermore, Awais, Laber, Rasheed, and Khursheed (2016) found that investors with a high level of financial literacy will have a greater risk tolerance. Sjöberg and Engelberg (2009) conducted research on students in a Swedish university and also found that students who have a high level of financial literacy are willing to take more risks than others. Hypothesis five is proposed as follows:

H5: Financial literacy significantly affects the financial risk tolerance of Indonesian millennials.

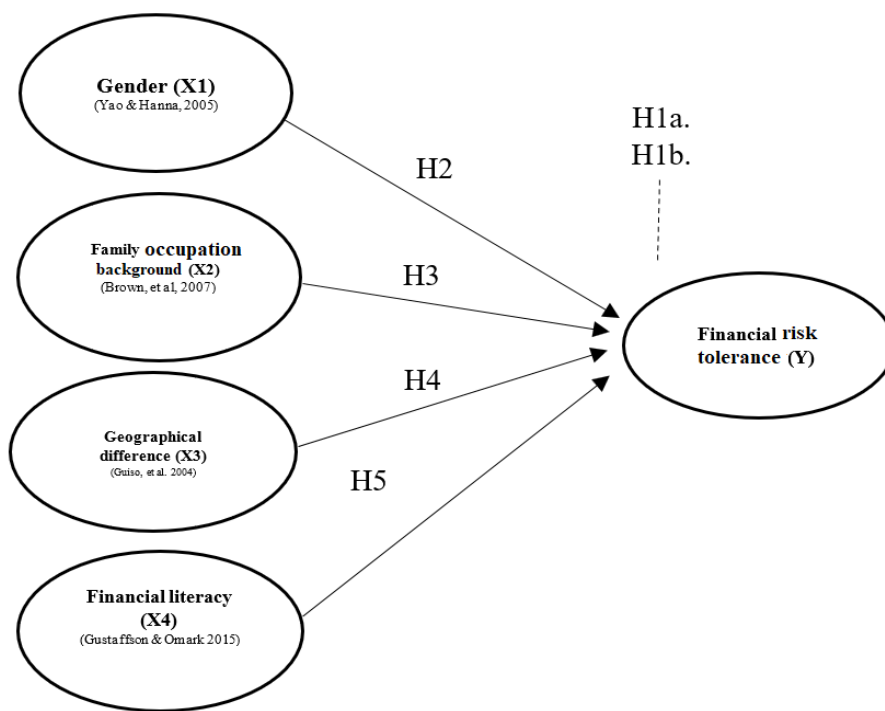Figure 1 illustrates the study's conceptual framework.

Figure 1. Conceptual framework.

3. RESEARCH METHOD

3.1. Population and Sample

The population of university students in Indonesia is 5,153,971, and students from western and eastern parts of Indonesia were used in the study sample. The reason why university students were selected is because they constitute a large portion of the millennial generation. Moreover, university students also have internet access to complete the online survey. The online survey was distributed to various universities in Indonesia that have students majoring in different areas, including finance, economics, business, and many non-business-related areas. Thus, the sample is expected to comprise a variety of levels of financial knowledge and a mix of genders.

The minimum requirement of the sample is 400, based on the Taro Yamane formula (Burns & Bush, 2010).

$$\text{Minimum } n = \frac{N}{N.d^2 + 1}$$

N = number in the sample

N = total population

D = level of precision (the defined error rate is 5% and the confidence level is 95%)

Sample calculation with Yamane's formula:

$N = 5{,}153{,}971$

$d = 0.05$

$$n = \frac{5{,}153{,}971}{5{,}153{,}971(0.05^2) + 1}$$

= 399.968 (rounded to 400)

3.2. Variables

Table 1 contains the definitions and measurements of the variables used in this study.

Table 1. Research variables.

Variable	Definition	Category/Indicator item	Scale
Financial risk tolerance (Y)	Financial risk tolerance is defined as the level of people's willingness to accept the maximum amount of uncertainty when making financial decisions (Grable, 2000)	The questionnaires measure eight different risk dimensions: guaranteed vs probable gamble, general risk choice, choice between sure loss and sure gain, risk as experience and knowledge, risk as level of comfort, speculative risk, prospect theory and investment risk	Ordinal
Gender (X1)	Gender refers to the socially given attributes, roles, activities, responsibilities and needs connected to being men (Masculine) and women (Feminine) in each society at a given time (Zobnina, 2009)	Male (Dummy = 1) Female (Dummy = 0)	Nominal
Family occupation background (X2)	The occupation of the head of the family who is responsible for the socioeconomic wellbeing of the household	Self-employed (Dummy = 1) Not self-employed (Dummy = 0)	Nominal
Geographical location (X3)	Region where the university of the respondent is located	West Indonesia (Dummy = 1) East Indonesia (Dummy = 0)	Nominal
Financial literacy (X4)	The ability to use knowledge and skills to manage financial resources effectively for a lifetime of financial wellbeing (Hung, Parker, & Yoong, 2009)	The questionnaire verified a person's financial literacy through questions regarding numeracy, inflation, and money illusion	Ordinal

3.3. Questionnaire Design

In order to measure the financial risk tolerance, this research used a questionnaire that was designed based on the existing measure developed by Gustafsson and Omark (2015), who designed the questionnaire by combining the study by Grable. and Lytton (1999) on financial risk tolerance and the study by Rooij, Lusardi, and Alessie (2011) on financial literacy. The questionnaire uses a five-point Likert scale for each scenario in order to increase the response rate and response quality and to reduce respondents' frustration level since it allows a neutral response (Adelson & McCoach, 2010). However, this questionnaire uses the Indonesian rupiah as the currency instead of US dollars, which was used in the original questionnaire, since the respondents are living in Indonesia and use the Indonesian rupiah on a daily basis.

The questionnaire consists of three parts: demographic variables, financial literacy and risk scenarios. The first section consists of four questions regarding the respondent's background (birth year, gender, family occupation background and geographical location (university location)), and three questions regarding risk awareness. The second section comprised three questions about financial literacy. These queries confirmed the individual's actual financial literacy with questions on numeracy, inflation, and money illusion. Finally, the last section in the questionnaire asked seven questions regarding different risk scenarios.

The questions were designed to be closed questions by providing alternatives that the respondents were forced to choose between (Saunders, Lewis, & Thornhill, 2012). The advantages of this type of question are that it takes less time and it is easier to compare answers between respondents. The questionnaire was designed in Bahasa Indonesia since the majority of the respondents have Bahasa Indonesia as their mother tongue. The questionnaire was carefully translated from English into Bahasa Indonesia to avoid mistranslation. Furthermore, it was considered that not all individuals studying at university level are familiar with English, and therefore the use of Bahasa Indonesia would help to avoid bias.

3.4. Method of Analysis

3.4.1. One-way ANOVA Test

To test hypotheses 1a and 1b, the analysis of variance (ANOVA) test was employed, which is used to investigate the mean difference of more than two groups in a sample. The ANOVA test will indicate whether a significant difference exists between the means of at least two groups. This is called a green flag procedure, meaning that if there is at least one pair of means that are statistically different, the ANOVA will signal this by indicating significance (Burns & Bush, 2010). However, the ANOVA test will not address how many pairs or which pair of means is significantly different. A further test called the post hoc test should be conducted to identify how many and which pair have a statistically significant difference.

3.4.2. Multiple Regression

To test hypotheses 2, 3, 4 and 5, multiple regression was employed using SPSS (Statistical Package for the Social Sciences) version 22. In this research, multiple regression was used to explain the correlation between the variables and its effect on the response. The multiple regression of this research is described below.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Y: Financial risk tolerance score

X_1: Gender

X_2: Family occupation background

X_3: Geographical location

X_4: Financial literacy

β_0: Intercept (constant)

$\beta_1, \beta_2, \beta_3, \beta_4$: Coefficients of the variables

ε: Errors.

Table 2. Demographic characteristics of the participants.

Variable	Frequency	%
Gender		
Male	137	33.4
Female	273	66.6
Total	410	100
Family occupation background		
Self-employed	142	34.6
Not self-employed	268	65.4
Total	410	100
Geographical location		
West Indonesia	272	66.3
East Indonesia	138	33.7
Total	410	100

4. RESULTS AND DISCUSSION

Table 2 displays the demographic characteristics of the participants as the independent variables of this research. Out of a total of 410 respondents, 137 were male (33.4%) and 273 were female (66.6%). There were 142 students with a self-employed family background (34.6%) and 268 students with a non-self-employed family background (65.4%). From West Indonesia there were 272 students (66.3%), and from East Indonesia there were 138 students (33.7%).

4.1. Descriptive Analysis of Financial Risk Tolerance

In this research, all 410 participants could achieve a minimum score of 10 and a maximum of 50. The level of financial risk tolerance is divided into five risk categories: very conservative (10–17); conservative (18–25); moderate

(26–33); aggressive (34–41); and very aggressive (42–50). Table 3 shows that the level of financial risk tolerance of the respondents varies from very conservative to aggressive. However, there were no respondents in the very aggressive category. Most of the respondents (247) were in the moderate level category. The average risk score of all respondents is 27.8219 with a standard deviation of 4.5764. The mean value indicates that the respondents of this survey had a moderate level (26–33) of financial risk tolerance (Pompian, 2016).

Table 3. Descriptive analysis of financial risk tolerance.

Financial risk tolerance level	N	Mean	Std. deviation	Minimum	Maximum
Very conservative	4	15.250	2.872	11	17
Conservative	122	22.663	1.865	18	25
Moderate	247	29.400	2.229	26	33
Aggressive	37	35.648	1.946	34	41
Total	410	27.822	4.576	11	41

The results of this study indicate that Indonesian millennials have a moderate level of financial risk tolerance, thus rejecting hypothesis 1a (H1a) which states that the level of Indonesian millennials' risk tolerance is conservative. The difference in the result between this study and previous studies is probably caused by the different research locations and cultural factors. This will be followed by a discussion on whether there is a significant mean difference between each level of financial risk tolerance in the survey.

Table 4. One-way ANOVA of financial risk tolerance level categories.

Variable	Sum of squares	Df	Mean square	F	Sig.
Between groups	6760.279	3	2253.426	506.662	0.000
Within groups	1805.724	406	4.448		
Total	8566.002	409			

Based on the results in Table 4, the Sig. value from the ANOVA is 0.000 < 0.05, which indicates that there is a significant difference between the mean values of each level of financial risk tolerance. The group that has a significantly different mean can be determined through the Tukey HSD (honestly significant difference) post hoc test (see Table 5). Based on the data below, the levels of financial risk tolerance for all groups have a significantly different mean value to each other. Therefore, hypothesis H1b is accepted.

Table 5. Multiple comparisons of financial risk tolerance level categories.

Variable	(I) Level of financial risk tolerance	(J) Level of financial risk tolerance	Mean difference (I-J)	Std. error	Sig.	95% Confidence interval	
						Lower bound	Upper bound
Tukey HSD	Very conservative	Conservative	-7.413*	1.071	0.000	-10.178	-4.649
		Moderate	-14.150*	1.062	0.000	-16.893	-11.408
		Aggressive	-20.398*	1.110	0.000	-23.262	-17.535
	Conservative	Very conservative	7.413*	1.071	0.000	4.649	10.178
		Moderate	-6.736*	0.233	0.000	-7.338	-6.134
		Aggressive	-12.984*	0.395	0.000	-14.005	-11.963
	Moderate	Very conservative	14.150*	1.062	0.000	11.408	16.893
		Conservative	6.736*	0.233	0.000	6.134	7.338
		Aggressive	-6.247*	0.371	0.000	-7.206	-5.288
	Aggressive	Very conservative	20.398*	1.110	0.000	17.535	23.262
		Conservative	12.984*	0.395	0.000	11.963	14.005
		Moderate	6.247*	0.371	0.000	5.288	7.206

Note: * indicates that the mean difference is significant at the 0.05 level. Risk score is the dependent variable.

4.2. Multicollinearity Test

The aim of the multicollinearity test is to check whether the independent variables have a high correlation or not. If a high correlation appears, this means that the relationship between the dependent and independent variables can be distributed. The rule for the multicollinearity test is if the tolerance is above 0.1 and the variance inflation factor (VIF) is below 10, the variable is free of multicollinearity. Table 6 presents the multicollinearity test results.

Table 6. Multicollinearity test results.

Model	Collinearity statistics	
	Tolerance	VIF
(Constant)	0.964	1.043
Gender	0.984	1.016
Family occupation background	0.998	1.002
Geographical location	0.932	1.073
Financial literacy	0.932	1.063

Note: Risk tolerance is the dependent variable.

According to the data above, the tolerance values for all four independent variables are bigger than 0.1, and the VIF values are all smaller than 10; therefore, all variables are free of multicollinearity. This indicates that correlation between the independent variables will not cause any instability in the following multiple regression analysis.

4.3. Multiple Linear Regression Analysis

The rule to reject H0 is ρ-value < α (0.05). From Table 7, the test results show that the ρ-value of gender is 0.000, which is < α (0.05). Furthermore, the t value also shows higher number than the t table (5.021 > 1.960). This indicates that the variable X1 (gender) is significant and H2 is therefore accepted. It also means that gender difference significantly affects financial risk tolerance. The unstandardized beta coefficient shows that the relationship between the dependent and independent variables is positive, which indicates that males have a higher financial risk tolerance – this study coded males as 1 (included group) and females as 0 (excluded group). In other words, the financial risk tolerance among males is 2.315 higher than the financial risk tolerance among females.

This result is consistent with the studies by Ardehali et al. (2005); Halek and Eisenhauer (2001); Nairn (2005) and Yao. and Hanna (2005), who found a significant relationship between gender and financial risk tolerance. The difference of financial risk tolerance among genders can be attributed to women having a higher sense of security than men and are less willing to take on financial risk (Hallahan et al., 2004; Powell & Ansic, 1997). Furthermore, some studies also found that women are more conservative and not especially materialistic, while men are more likely to place higher value on money (Gustafsson & Omark, 2015).

Table 7. Multiple regression.

Model		Unstandardized coefficients		Standardized coefficient	T	Sig.
		B	Std. error	Beta		
1	(Constant)	24.945	0.563	0.392	44.278	0.000
	Gender	2.315	0.461	0.239	5.021	0.000
	Family occupation background	0.317	0.454	0.033	0.698	0.486
	Geographical location	1.031	0.473	0.107	2.179	0.030
	Financial literacy	0.688	0.231	0.146	2.979	0.003

Note: Risk tolerance is the dependent variable.

In Table 7, the ρ-value of family occupation background is 0.486, which is > α (0.05). Furthermore, the t value also shows a lower number than the t table (0.698 < 1.960). This indicates that the variable X2 (family occupation background) is not significant and, therefore, H3 is rejected. It also means that different family occupation backgrounds do not significantly affect financial risk tolerance. However, this finding is not consistent with the study

conducted by Brown et al. (2007), who studied self-employment and risk preference and found that a father's occupation has a significant relationship with an individual's risk preference. However, this finding is supported by Azwar (2013), who found that the parent's occupation background does not significantly affect the entrepreneurship intentions of students in Indonesia. Therefore, students whose parents have a self-employed background were not proven to have higher entrepreneurship intention than students whose parents have a non-self-employed background. This result is probably caused by weak family communication and unstable family environments. Furthermore, Alwi, Hashim, and Ali (2015) revealed that, besides parental socialization, aspects of the living environment that affect financial decision making among students are peer influences and self-dominance. In this case, it is suspected that peer influence and self-dominance are greater than parents' influence as the students become older, especially college students (Jorgensen, 2007).

Table 7 shows that the ρ-value of geographical location is 0.030, which is < α (0.05). Furthermore, the t value also shows higher number than the t table (2.179 > 1.960). This indicates that the variable X3 (geographical location) is significant; therefore, H4 is accepted. It also means that different geographical locations significantly affect the financial risk tolerance. The unstandardized beta coefficient shows that the relationship between the dependent and independent variables is positive, which indicates that millennials from West Indonesia have a higher financial risk tolerance, since West Indonesia is coded as 1 (included group) and East Indonesia is coded as 0 (excluded group). In other words, the financial risk tolerance of millennials in West Indonesia is 1.031 higher than the financial risk tolerance of millennials in East Indonesia. This result is consistent with the study by Barsky et al. (1997), who found a significant relationship between financial risk tolerance and geographical location. The difference of financial risk tolerance in difference geographical locations can be caused by culture differences (Bonin et al., 2009; Guiso et al., 2004; Weber & Hsee, 1998) and differences in income and wealth (Riley Jr & Chow, 1992) in those regions. The economic, social and cultural aspects of regions can be summarized in a comprehensive process of development paradigm. Furthermore, the level of development of a region can be determined through the Human Development Index (HDI). In this study, the two regions have different HDI: West Indonesia has a HDI of 70.80, which is above the national HDI of 70.18, and East Indonesia has a HDI of 66.5, which is below the national average (Central Bureau of Statistics, 2018).

Table 7 also shows that the ρ-value of financial literacy is 0.003, which is < α (0.05). Furthermore, the t value also shows a higher number than the t table (2.979 > 1.960). This indicates that the variable X4 (financial literacy) is significant and thus H5 is accepted. It also means that the level of financial literacy significantly affects financial risk tolerance. The unstandardized beta coefficient shows that the relationship between the dependent and independent variables is positive, which indicates that with an increase of one in the financial literacy score, the financial risk tolerance will increase by 0.688. This is consistent with the studies by Gustafsson and Omark (2015); Hallahan et al. (2004); Ryack (2011) and Yao et al. (2011). The significant effect of financial literacy on financial risk tolerance is because financial literacy includes knowledge of collecting, processing and projecting data on compound interests, diversification ratios and inflation (Obure, 2017) and can help investors to avoid investment mistakes. Furthermore, financial literacy is also believed to have a positive influence for people because it can increase confidence and motivation in making financial decisions since they can use the information they have as a guide (Hunt, 2016).

4.4. Discussion

With regard to the empirical findings, this study contributes to the support for the prospect theory in which gender, geographical location and financial literacy significantly influence the financial risk tolerance of Indonesian millennials. Geographical location difference is also confirmed as a significant determinant of financial risk tolerance, which strengthens the existing evidence from prior research by Barsky et al. (1997). Furthermore, the results offer evidence of a positive effect of financial literacy score on financial risk tolerance that is consistent with the studies by Gustafsson and Omark (2015); Hallahan et al. (2004); Ryack (2011) and Yao et al. (2011).

However, this research also found that family occupation background is not a significant factor of financial risk tolerance among Indonesian millennials. This result is contrary to the study by Brown et al. (2007). It means that in the context of Asian culture, and specifically Indonesia, family occupation background does not have any influence on financial risk tolerance. Respondents from a self-employed or non-self-employed family tend to have a moderate level of financial risk tolerance, which implies that, for further study, family occupation background can be replaced by other factors to measure financial risk tolerance.

Importantly, this study also indicates that Indonesian millennials have a moderate level of financial risk tolerance, which is higher than the predicted conservative level found by Loc (2017). The different findings are assumed to be caused by the culture and lifestyle differences between Indonesia and the countries where the prior research was conducted (mostly in the Unites States and Europe).

As suggested above, the assessment of financial risk tolerance is a highly important factor for the development of an appropriate investment portfolio. This study helps financial institutions to accurately and efficiently promote or market their financial products to the targeted investors. By understanding the level of risk tolerance of prospective investors, financial advisors can better individualize investment options. On the subject of managerial implications, this study offers insight to financial advisors in Indonesia regarding how gender, geographical location and financial literacy might affect financial risk tolerance. Since this study found that Indonesian millennials have a moderate level of financial risk tolerance, financial institutions should offer financial products with a consistent pattern of returns with few fluctuations. Considering the risk tolerance level of the sample of this study, a typical portfolio includes a balance of fixed income and equities may make good sense for Indonesian millennials.

Millennials will soon become the main participants in financial markets. Therefore, marketers will need to reevaluate product positioning and marketing strategy to target millennials. Financial institutions can develop specialty investment packages for selected groups of millennials to meet specified goals. Specialty investment packages can be designed to address their goals as well as their risk tolerance level. This study demonstrates that male millennials are more risk tolerant than female millennials; millennials from West Indonesia have a higher risk tolerance than millennials from East Indonesia; and millennials with higher financial literacy also have a higher financial risk tolerance. Therefore, based on this result, it is suggested that financial advisors should offer relatively riskier financial products to male millennials, millennials from West Indonesia, and millennials with higher financial literacy. Furthermore, financial institutions can use the findings from this study to begin identifying millennial groups who need to improve their financial education and financial literacy, which can lead to higher risk tolerance. The increase of financial literacy also will likely increase the public interest to invest in the capital market.

5. CONCLUSION

This study examined the financial risk tolerance of a group of millennials in Indonesia, represented by university students, and the factors that influence financial risk tolerance. The framework of the study uses financial risk tolerance as the dependent variable, and gender, family occupation background, geographical location and financial literacy as the four independent variables. Based on the analysis, the average risk score for all respondents is 27.8219. The mean value indicates that the respondents of this survey have a moderate level (26–33) of financial risk tolerance. Furthermore, the second research objective of this study was to identify how gender affects financial risk tolerance. Based on the t-test results, it was found that gender significantly affects the financial risk tolerance of Indonesian millennials, and male millennials are more risk tolerant than female millennials. The third objective of this study was to identify how much family occupation background affects financial risk tolerance. Based on the t-test result, this study found that family occupation background does not affect financial risk tolerance. The fourth research objective was to discover how much the geographical difference affects financial risk tolerance. Based on the t-test results, it was found that geographical difference significantly affects the financial risk tolerance of Indonesian millennials. Millennials from West Indonesia have a higher risk tolerance than millennials from East Indonesia. The fifth research

objective was to identify how much financial literacy affects the financial risk score. Based on the t-test result, it was found that financial literacy significantly affects financial risk tolerance. The relationship between the dependent and independent variables is positive, which indicates that an increase in the financial literacy score will lead to an increase in financial risk tolerance.

Based on the results of this study, it is suggested that future research should add more variables that have an influence on financial risk tolerance, such as age, university major or business ownership, to enrich the findings on this topic in order to improve the understanding and strengthen the research results. Future research could also use a longitudinal study since this type of research can provide a high level of accuracy and validity and makes it possible to identify developmental trends. Finally, future studies can apply experimental research methods to provide better results which can be checked and verified because the research design is repeatable and the researcher has control over the variables.

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