

# The Effects of Risk Tolerance and Financial Literacy to Investment Intentions

**Andriani Samsuri<sup>a</sup>, Fitri Ismiyanti<sup>b</sup>, I Made Narsa<sup>c</sup>,** <sup>a</sup>Doctoral Program at the Faculty Of Economics and Business, Airlangga University, Surabaya Indonesia, <sup>b</sup>Supervisor at the Faculty Of Economics and Business, Airlangga University, Surabaya Indonesia, <sup>c</sup>Co-Supervisor at the Faculty Of Economics and Business, Airlangga University, Surabaya Indonesia, Email: <sup>a</sup>[andriani\\_samsuri@yahoo.com](mailto:andriani_samsuri@yahoo.com), <sup>b</sup>[fitri.ismiyanti@feb.unair.ac.id](mailto:fitri.ismiyanti@feb.unair.ac.id), <sup>c</sup>[i-made-n@feb.unair.ac.id](mailto:i-made-n@feb.unair.ac.id)

Financial decisions have become important to researchers, personal financial planners, investment consultants and policy-makers, particularly considering the changes that have increased the complexity of the economic landscape. Within the domain of financial decision-making, an individual's tendency to take a risk plays a crucial role in the making of financial decisions and in achieving financial goals. This article provides conceptual development of the relationship between financial literacy, risk tolerance and investment intention. Many articles have documented the correlation between financial literacy and a set of behaviours, such as saving, wealth and portfolio choice. Meanwhile, risk tolerance is a significant factor in a number of household financial decisions. In order to predict intentions and behaviour, the planned behaviour theory has tested that attitude, subjective norm and perceived behaviour control as determinants of intention and behaviour. In the context of this study, investors may be interested in investing in a particular company only when they have sufficient time and skill to evaluate the company and also have money to invest. Therefore, when forming an intention to invest, individual investors normally begin with evaluations of various companies' financial positions, based on some objective measures such as return on equity, dividend payout ratio and beta. Next, their emotional perceptions of such evaluations may come into effect as they are trying to justify their investment decisions to purchase the companies' stocks.

**Key words:** *Financial decision, financial literacy, risk tolerance, investment intention.*

## Introduction

Risk tolerance has been conceptualised separately, measured and evaluated in many recent empirical studies. It is defined as the maximum uncertainty that will be received when making personal financial decisions or the willingness to take risks on unfavourable results for opportunities to achieve more profit (Frijns et al., 2008; Grable, 2008; Grable and Joo, 2004). As shown in the review of risk tolerance research, there is consensus that individuals who are more financially literate tend to be more tolerant of risk (Gibson et al., 2013; Grable and Joo, 1999, 2004; Grable, 2000; Grable and Roszkowski, 2008). Furthermore, Grable and Joo (1999) state that financial knowledge is the most important factor when it comes to predicting risk tolerance compared with other factors such as demographics and socioeconomic characteristics. Likewise, Grable (2000) found that a combination of personal characteristics and socioeconomic background played a role in achieving financial success.

Frijns et al. (2008) examined the effect of self-assessed financial expertise on portfolio choices. They found that individuals who valued themselves low in terms of financial expertise tended to allocate their funds into less risky assets. In their study of the financial literacy of Australian students, Beal and Delpachitra (2003) found that participants with higher financial expertise were less risk-averse (more risk tolerant). The ability to understand financial literacy is very important in making good investment decisions.

Several studies have revealed financial literacy interventions in individual financial decision-making processes. The researchers revealed that the biggest problem causing a person to stay away from investment is a lack of financial knowledge (Jureviciene and Jermakova, 2012). People who are financially literate and know the difference between mutual funds and stocks are willing to take risks during the investment decision-making process. People who are less financially literate about the stock market do not want to take risks (Sabri, 2016). Risk tolerance and its relationship with financial or investment decision-making are explained by two theoretical perspectives in the literature: traditional finance (normative model/theory) and behaviour finance (descriptive model/theory) (Grable, 2008).

A strong individual has a different level of risk tolerance to individuals with little or no wealth. As a result, risk tolerance increases with increasing wealth (Chaulk et al., 2003). In addition, risk tolerance is not only related to the amount of individual wealth. Individuals have different levels of risk tolerance due to different life experiences and differences in social and cultural backgrounds (Olsen and Cox, 2001). Risk tolerance, and its relationship with financial or investment decision-making, can be explained by two theoretical perspectives in the literature: the traditional finance (normative model/theory) and behaviour finance (descriptive model theory) (Grable, 2008).

Research conducted by Jihadi (2018) states that there is a significant positive effect between financial literacy and investment intentions. This means that the higher a person's financial literacy, the higher their intention to invest. This is related to Sabri's (2016) research, which says that people with low financial literacy do not want to take risks. The next question is whether it is possible for people with low financial literacy to have high financial tolerance so investment intention is high.

## **Review of Previous Research**

### ***Financial Literacy***

There are several definitions of financial literacy expressed by researchers, including Servon and Kaestner (2008), which state that financial literacy is a person's ability to understand and utilise financial concepts. Lusardi and Mitchell (2011) also state that individuals who have high levels of financial literacy understand compound interest rates. According to Agarwalla et al. (2013), individuals who have high financial literacy will understand the time value of money, and will participate in the formal financial markets and stock markets (Klapper et al., 2012; Lusardi et al., 2009).

Some studies reveal the involvement of financial literacy in the process of making individual financial decisions. The researchers revealed that the biggest problem that caused a person to avoid investing was a lack of financial knowledge (Jureviciene and Jermakova, 2012). The study found that people who are financially literate and know the difference between mutual funds and stocks are willing to take risks during the investment decision-making process. People who are less financially literate about the stock market do not want to take risks (Sabri, 2016).

There is an argument that perceptions of financial knowledge can have an additional effect on financial behaviour. Perceived financial knowledge (or trust) has been shown to be strongly correlated with a large number of financial decisions (Allgood et al., 2016; Anderson et al., 2016; Farrell et al., 2016; Tang and Baker, 2016). In fact, the correlation between actual financial knowledge and perception has been found to be rather weak (Lusardi and Mitchell, 2009; Parker et al., 2011).

There are various definitions of financial literacy in the literature. For example, financial literacy can be defined as broadly as a general understanding of the economy, or just as a matter of money management (Gallery et al., 2011). It can also be referred to by different terms – for example, 'financial capability' in the United States, which includes different components such as financial skills, attitudes and knowledge (Gallery et al., 2011). However, there are other definitions that have been widely accepted (Galeri et al., 2011), namely 'the

ability to make informed judgements and make effective decisions regarding the use and management of money' (Noctor, Stoney and Stradling, 1992; Schagen and Lines, 1996).

A more detailed explanation of financial literacy is presented by Vitt (2005), who states that financial literacy is the ability to read, analyse, manage and write financial conditions related to life. As clarified further by Mandell and Klein (2007), financial literacy also covers several financial aspects: basic knowledge of personal finance, money management, credit management, savings and investment, and risk management. The financial literacy of an individual is directly related to behaviour individual finance (Gustafsson and Omark, 2015). Increased financial literacy can lead to effective financial decisions (Bernheim et al., 2001).

Al-Tamimi and Al Anood (2009) note that, on average, investors lack knowledge of money issues and investment decisions; this is what happens in developing countries. Some literature has also been published that identifies those factors that cause the separation of financial knowledge and investment decisions. The issue of financial literacy is not uncommon in developing countries. Studies show that, because of the unconsciousness of financial products, most people in developing countries do not invest in financial products (Honohan, 2008).

### ***Risk tolerance***

(Financial) risk is usually assumed to be a function of the possible return distribution. The greater the variance, the greater the risk (Olsen, 2008). Risk tolerance is one of the characteristics that is most needed by an investor if they are to succeed. Individual risk tolerance is assumed to be the main determinant in the selection of asset allocation, securities selection and strategic objective plans, so risk tolerance assessments talk more about plans for future goals (Grable and Lytton, 2001).

Risk tolerance can be defined as the willingness of individual investors to take investment decisions where there is a desired goal but the achievement of that goal is uncertain and there is a possibility of loss (Kogan and Wallach, 1964, cited in Grable, 2008). Risk tolerance affects the decisions of investors who invest their savings for short-term and long-term goals. Investors with various levels of risk tolerance behave differently when making investment decisions regarding various investment avenues. Furthermore, Cordell (2001) divides investment risk tolerance into four elements: attitudes towards risk, financial ability to bear risk, knowledge, and the tendency to secrecy. Risk tolerance is not static, but changes constantly. In good times, when asset prices rise, people tend to have a higher risk tolerance. On the other hand, in bad times, risk tolerance decreases to a low level (Grable et al., 2006).

However, Roszkowski (1998, cited in Grable and Lytton, 2001) states that it is not easy to assess a person's risk tolerance. This is because risk tolerance is difficult to understand, and the concept is unclear. Hallman and Rosenbloom (1987) add that investor risk tolerance tends to be subjective rather than objective, and is rather difficult to measure because investor risk tolerance refers to how well an investor is able to overcome the volatility of stock prices and how well they are able to control attitudes and emotional tolerance in facing risk. This opinion is reinforced by Trone et al. (1996), who state that the ability to achieve the desired investment objectives is most significantly influenced by the emotional ability of investors to accept the possibility of loss in portfolio value. Pak and Mahmood's (2012) research supports Trone et al.'s (1996) finding that investors will not behave rationally in all situations: sometimes, they can show opportunistic or irrational behaviour in the investment decision-making process. Therefore, the government must take effective steps to control such behaviour, because if they do not, the stock market can 'balloon'.

Most macroeconomic models describe risk as an internal component of an asset. However, prospect theory defines risk differently, not only related to assets but also to investors, and more precisely to the amount of wealth a person owns. Wealthy individuals have different levels of risk tolerance than individuals who have little or no wealth. As a result, risk tolerance increases with increasing wealth (Chaulk et al., 2003). In addition, risk tolerance is not only related to the amount of individual wealth, as individuals have different levels of risk tolerance due to different life experiences.

There are two main theoretical perspectives that can explain risk tolerance and its relationship to investment decision-making. The first is the traditional financial model (normative model), which assumes that rational behaviour determines how individuals must make decisions, in accordance with expected utility theory (Von Neumann and Morgenstern, 1947). The theory is the most popular model (Grable, 2008). The second is behaviour finance theory (descriptive model), which opposes the assumption of rational behaviour and assumes that individuals are generally irrational and that behavioural biases or cognitive errors are involved in their decision-making (de Dreu and Bikker, 2012). Behaviour finance has received more attention with leading theories such as prospect theory (Kahneman and Tversky, 1979, 1984), where individuals see their advantages and disadvantages differently and their risk tolerance is related to how the problem is framed (the problem of framing).

Risk tolerance is an important factor influencing various personal financial decisions (Snelbecker et al., 1990, cited in Grable, 2008). Risk tolerance and its relationship with financial or investment decision-making are explained by two theoretical perspectives in the literature: traditional finance (normative model/theory) and behaviour finance (descriptive model/theory) (Grable, 2008). In general, the normative model determines how people make

decisions rationally, while the descriptive model describes how and why people make actual decisions and behave non-rationally (Grable, 2008).

### ***Investment Intentions***

Various experts define intention in many ways. In general, intention is considered to be an individual indication of what someone will do in the future. Thus, a person's intention is their desire or plan to take the action in question at a point in the future. Because intention presents information about the future direction, attitudes, beliefs, and intentions usually adjust over time. Bird (1988) states that intention is a state of mind that directs one's attention to certain objects (goals) based on past experiences or certain ways of achieving things. According to Angelle (2006), an individual's intention is their resolution to act in a certain way. Furthermore, it is said that intention is the construct of intentional and clear attitudes and individual intrinsic values that play an important role in predicting the future behaviour of individuals.

Intention is assumed to identify motivational factors that influence behaviour and to show how hard people want to try or how much effort they will make to conduct the behaviour (Ajzen, 1991). In other words, the individual's future behaviour can be predicted by intention because intention is the first step that forms the next pattern of behaviour. As a result, that intention can indicate the direction of possible individual behaviour in the future.

In the theory of reasoned behaviour, Fishbein and Ajzen (1975) state that it is assumed an individual will act rationally and act using available information. Furthermore Ajzen (1991) suggests that the stronger the intention to engage in behaviour, the more likely the performance will be. Several studies involving financial products have used investment intentions as a dependent variable, including Dey et al. (2015), Kozup et al. (2008) and Lim et al. (2013). Lim et al. (2013) conducted research on the Singapore market, showing a negative relationship between market investment intentions and risk aversion.

Beck (2004) also considers intention as someone's adoption of an action based on several other actions, where the results might be known for each action. Hanafiah et al. (2016) found that a positive relationship exists between economic benefits and intrinsic rewards, and the intention to invest. Intrinsic appreciation is determined in terms of a sense of personal achievement and self-satisfaction. The results show that intrinsic rewards are the most important factor in predicting an entrepreneur's intention to invest in the future (Hanafiah et al., 2016). More explicitly, Calvart and Campbell (2007) state that there is a positive relationship between knowledge and financial behaviour.

## Research Objectives

This study formulated several research objectives based on gaps in the existing literature:

- a To study the potential influence of risk tolerance on the relationship between financial literacy and investment intentions.
- b To provide useful insights into the application of financial behaviour and financial decision-making.

## Methodology

The research method in this article is a literature review. Although an exhaustive literature review cannot be carried out due to various constraints, a large amount of literature has been reviewed and provided, including that published by Emerald Insight, Elsevier, JStor, EBSCOhost, Google Scholar, SSRN, Research Gate, Taylor and Francis and some online journal articles.

The keywords used to search the literature were *financial literacy*, *risk tolerance* and *investment intentions*. The literature search results were then summarised, tabulated and analysed using a workbook to provide a conceptual framework.

## Results and Findings

### *Financial Literacy and Investment Intentions*

Many researchers have defined financial literacy. Servon and Kaestner (2008) define it as a person's ability to understand and utilise financial concepts. Individuals have a high level of financial literacy, based on compound interest (Lusardi and Mitchell, 2011), the time value of money (Agarwalla et al., 2013) and their participation in formal financial markets and stock markets (Klapper et al., 2012; Lusardi et al., 2009). Several studies have revealed financial literacy interventions in individual financial decision-making processes. The researchers revealed that the biggest problem causing someone to stay away from investment is a lack of financial knowledge (Jureviciene and Jermakova, 2012). The study found that people who have financial literacy and know the difference between mutual funds and stocks are willing to take risks during the investment decision-making process. People whose financial literacy about the stock market is low do not want to take risks (Sabri, 2016).

Individuals who have high financial literacy participate in risk investments (Van Rooij et al., 2007). Households with little knowledge make poor investment decisions (Lusardi and Mitchell, 2007). The issue of financial literacy is less prevalent in developing countries. Studies show that because of the unconsciousness of financial products, most people in

developing countries do not invest in financial products (Honohan, 2008). Lusardi (2004) found that there was a marked increase in total net worth and financial wealth that was seen after parents were provided with financial seminars at work.

### ***Financial Literacy and Risk Tolerance***

Grable and Joo (1999) state that financial knowledge is one of the most important factors for predicting risk tolerance and incorporating that factor into a risk tolerance regression model causes demographic factors to be less important. Likewise, Grable (2000) also found that the combination of financial knowledge, education, income and employment was the biggest influence on risk tolerance in everyday money matters.

The relationship between financial literacy and risk tolerance has been proven in previous studies (Frijns et al., 2008; Grable, 2000; Grable and Joo, 1999, 2000, 2004; Grable and Roszkowski, 2008; Gibson et al., 2013). Frijns et al. (2008) examined the effect of self-valued financial expertise on portfolio choices, and found that individuals who valued themselves low in terms of financial expertise tended to allocate their funds into less risky assets.

### ***Risk Tolerance and Investment Intentions***

Kiev (2002) described risk as one of the most important factors related to investment behaviour. The ability to adapt to risk and maintain a certain level of risk even when under pressure to make large losses is what makes an investor successful. Meanwhile, financial risk usually is assumed to be a function of the possible return distribution. The greater the variance, the greater the risk (Olsen, 2008). Tolerance of risk is one of the characteristics most needed by an investor if they want to succeed.

Financial theory assumes that investors logically think to increase their capital and pay attention to financial markets. When choosing investments, investors will compare the risks and returns obtained with the potential of other investments they could make. The level of risk that investors are willing to tolerate depends on their mental condition and characteristics. However, if faced with investments of the same risk, a logical investor will not opt for lower output. This is different from the general paradigm in classical financial theory, which notes that decision-makers have completely rational behaviour and maximise their profits. Studies conducted in the area of financial behaviour show that human decision-making is not a fully rational process, which considers all information; rather, decision-makers base decisions on emotions, leading to decisions that are not optimal. Lachanse and Tang (2012) examined the variable of trust in financial advisers. It is said that trusting financial advisers is fundamentally different from trusting an individual. Trust in financial



advisers is closely related to age and willingness to take investment risks. While willingness to take investment risks is related to risk aversion, it might also reflect trust.

According to Hanna and Chen (1997), profit or loss on investment and the increase or decrease in wealth have a positive relationship with risky investment decisions. In addition, Roszkowski and Davey (2010) state that financial risk tolerance reduces investor frustration and increases confidence in making better financial decisions. Likewise, investors assess the expected risk and return on investment according to their preferences. However, their risk perception related to investment decisions still depends on previous financial investment experiences that make losses and profits (Byrne, 2005; Corter and Chen, 2006).

### **Conclusion**

Based on Lusardi's (2004) research, it is known that an increase in total net wealth and financial wealth occurs after parents are given financial seminars at work. Conversely, poor investment decisions occur because households have little knowledge (Lusardi and Mitchell, 2007). It can thus be concluded that financial literacy has a positive effect on investment intentions.

The biggest problem that causes a person to stay away from investment is a lack of financial knowledge (Jureviciene and Jermakova, 2012). A study conducted by Sabri (2016) revealed that people have financial literacy and know the difference between mutual funds and stocks willing to take risks during the investment decision-making process. This means that the more financial knowledge someone has, the higher their risk tolerance will be.

The general paradigm in classical financial theory states that decision-makers have rational behaviour and want to maximise their profits. This is contrary to the theory of financial behaviour, because decision-makers use emotions that can lead to irrational and less than optimal decisions. Pak and Mahmood (2012) confirm that investors will not behave rationally in all situations. For this reason, financial advisers must take personal characteristics and risk tolerance factors into account when providing advice to their clients. It can be concluded that risk tolerance affects investment intentions.



## REFERENCES

- Agarwalla, S. K., Barua, S. K., Jacob, J., and Varma, J. R. 2013. *Financial Literacy among Working Young in Urban India*. IIMA Working Paper No. 2013-10-02, 1-27. ii.
- Al-Tamimi HAH., Al Anood K. 2009. *Financial literacy and investment decisions of UAE investors*. The Journal of Risk Finance, 10(5), 500 –516.
- Allgood, S., and W. B. Walstad. 2016. *The effects of perceived and actual financial literacy on financial behaviours*. Economic Inquiry. 54(1). 675–697.
- Ajzen, I., Fishbein, M. 1980. *Theory of reasoned action/Theory of planned behaviour*. *Social Psychology*. 2007.pp 67-98. Available from: [http://www.hsc.usf.edu/~kmbrown/TRA\\_TPBM.htm](http://www.hsc.usf.edu/~kmbrown/TRA_TPBM.htm).
- Ajzen, I., 1985. *From intentions to actions: a theory of planned behaviour*, in *Action Control: From Cognition to Behaviour*, dalam J. Kuhl, and J. Beckmann, Eds. New York: Springer, 1985, pp. 11-39.
- Ajzen, I., 1991. *The Theory of Planned Behaviour*. *Organizational Behaviour and Human Decision Processes*. 50(2). 179-211.
- Ajzen, I. 2006. *Constructing a theory of planned behaviour questionnaire*, available at: <http://people.umass.edu/aizen/pdf/tpb.measurement.pdf>.
- Anderson, A., F. Baker, and D. T. Robinson. 2017. *Precautionary savings, retirement planning and misperceptions of financial literacy*. *Journal of Financial Economics*. 126(2). 383– 398.
- Angelle, P. S., 2006. *Instructional Leadership and Monitoring: Increasing Teacher Intent to Stay Through Socialization*. *NASSP Bulletin*, 90(4), pp 318-334.
- Beal, Diana J. and Sarath B. Delpachitra. 2003. *Financial Literacy Among Australian University Students*. *Economic Papers* Vol. 22 No. 1 pp. 65-78
- Bird, B. 1988. *Implementing Entrepreneurial Ideas: The Case for Intention*. *Academy of Management Review*. 13(3), 442-453.
- Byrne, K. 2005. *How do consumers evaluate risk in financial products?* *Journal of Financial Services Marketing*, vol. 10, pp. 21-36.



- Chaulk, B., Johnson, P., and Bulcroft, R. 2003. *Effects of Marriage and Children on Financial Risk Tolerance: A Synthesis of Family Development and Prospect Theory*. Journal of Family and Economic Issues, 24(3), 257-280.
- Cordell, D. M. 2001. *RiskPACK: How to Evaluate Risk Tolerance*. Journal of Financial Planning, 14, 36-40.
- Corter, J. E. and Y.-J. Chen. 2006. *Do investment risk tolerance attitudes predict portfolio risk?* Journal of Business and Psychology, vol. 20, pp. 369-381.
- Delpechitre, D. and S. A. DeVaney. 2006. *Credit card usage among White, African American, and Hispanic households*. Consumer Interests Annual, vol. 52, pp. 466-472, 2006.
- De Dreu, and Jacob A. Bikker. 2012. *Investor sophistication and risk taking*. Journal of Banking & Finance 36, 2145–2156.
- Dey, Kumar and Ankur Srivastava. 2017. *Impulse buying intentions of young consumers from a hedonic shopping perspective*. Journal of Indian Business Research
- Farrell, L., T. R. Fry, and L. Risse. 2016. *The significance of financial self-efficacy in explaining women's personal finance behaviour*. Journal of Economic Psychology, 54, pp 85–99.
- Frijns, B., Koellen, E., and Lehnert, T. 2008. *On the determinants of portfolio choice*. Journal of Economic Behaviour and Organization. 66(2). 373-386.
- Fu, J.R., Farn, C.K. and Chao, W.P. 2006. *Acceptance of electronic tax filing: a study of taxpayer intentions*. Information and Management, Vol. 43 No. 1, pp. 109-126.
- Gallery, N., Gallery, G., Brown, K., Furneaux, C., and Palm, C. 2011a. *Financial literacy and pension investment decisions*. Financial Accountability and Management. 27(3). 286-307.
- Gallery, N., Newton, C., and Palm, C. 2011b. *Framework for assessing financial literacy and superannuation investment choice decisions*. Australasian Accounting Business and Finance Journal. 5(2). 3-22.
- Gibson, R., Michayluk, D., and Van de Venter, G. 2013. *Financial risk tolerance: An analysis of unexplored factors*. Financial Services Review, 22(1), 23-50.
- Grable, J., Lytton, R., O'Neil, B., Joo, S-H., and Klock, D. 2006. *Risk Tolerance, Projection Bias, Vividness, and Equity Prices*. The Journal of Investing, 15(2), 68-74.



- Grable, J. E. 2008. *Risk Tolerance*. In J. J. Xiao (Ed.), *Advances in Consumer Financial Behaviour Research* (pp. 1-20). New York: Springer.
- Grable, J. 2000. *Financial risk tolerance and additional factors that affect risk taking in everyday money matters*. *Journal of Business and Psychology*, 14(4), 625-630.
- Grable, J. E., and Joo, S.-H. 2004. *Environmental and biopsychosocial factors associated with financial risk tolerance*. *Journal of Financial Counseling and Planning*, 15(1), 73-82.
- Grable, J. E., and Lytton, R. H. 1998. *Investor risk tolerance: Testing the efficacy of demographics as differentiating and classifying factors*. *Journal of Financial Counseling and Planning*, 9(1), 61-74.
- Grable, J. E., and Lytton, R. H. 2001. *Assessing the concurrent validity of the SCF risk tolerance question*. *Journal of Financial Counseling and Planning*, 12(2), 43-53.
- Grable, J. E., and Lytton, R. H. 2003. *The development of a risk assessment instrument: A follow-up study*. *Financial Services Review*, 12(3), 257-274.
- Grable, J. E., and Roszkowski, M. J. 2008. *The influence of mood on the willingness to take financial risks*. *Journal of Risk Research*, 11(7), 905-923.
- Grable, J., and Lytton, R. H. 1999. *Financial risk tolerance revisited: the development of a risk assessment instrument*. *Financial Services Review*, 8(3), 163-181.
- Grable, J., Roszkowski, M., Joo, S.-H., O'Neill, B., and Lytton, R. H. 2009. *A test of the relationship between self-classified financial risk-tolerance and investment risk-taking behaviour*. *International Journal of Risk Assessment and Management*, 12(2), 396-419.
- Grable, J.E., and Joo, S-H. 1999. *Factors related to risk tolerance: a further examination*. *Consumer Interests Annual*, 45, 53-58
- Grable, J. 2000. *Financial Risk Tolerance and Additional Factors that Affect Risk Taking in Everyday Money Matters*. *Journal of Business and Psychology*. 14. 625-630.
- Grable, J. E. 2008. *Risk Tolerance*. In J. J. Xiao (Ed.), *Advances in Consumer Financial Behaviour Research* (pp. 1-20). New York: Springer.
- Grable, J. E., and Joo, S.-H. 2004. *Environmental and biopsychosocial factors associated with financial risk tolerance*. *Journal of Financial Counseling and Planning*, 15(1), 73-82.



- Guiso, L. Japelli, T. 2009. *Financial Literacy and Portfolio Diversification*. CSEF Working Papers Series, 212, 03.02.2016 <http://www.csef.it/WP/wp212.pdf>
- Gustafsson, G. and L. Omark. 2015. *Financial literacy's effect on financial risk tolerance: A quantitative study on whether financial literacy has an increasing or decreasing impact on financial risk tolerance*.
- Hanna, S. D. and P. Chen. 1997. *Subjective and objective risk tolerance: Implications for optimal portfolios*. Financial Counseling and Planning
- Hanafiah, M. H., Yousaf, S. U. and Hashim, N. A. 2016. *Entrepreneurs' Intention to Invest in Current Business: An Empirical Study of Malaysian SME Entrepreneurs*. Malaysian Journal of Society and Space 12(2), 119 – 131.
- Honohan, P. 2008. *Cross – country Variation in Household Access to Financial Services*.
- Jihadi, M. 2018. *Financial Literacy, Attitude, Subjective Norms, Perceived Behaviour Control and Intention to Invest*. Dissertation. Economic and Business Faculty of Airlangga University. Surabaya.
- Jureviciene Daiva and Jermakova Kristina. 2012. *The Impact of Individuals Financial Behaviour on Investment Decisions*. Electronic International Interdisciplinary Conference, 242-250.
- Kahneman, D., Tversky. A. 1979. *Prospect theory: An analysis of decision under risk*. *Econometrica*. Journal of the Econometric Society. 47(2). 263-291.
- Kiev, A. 2002. *The Psychology of Risk: Mastering Market Uncertainty*. John Wiley and Sons, Inc., New York.
- Kogan, N., and Wallach, M. A. 1964. *Risk taking: A study in cognition and personality*. New York: Holt, Rinehart and Winston .
- Klapper, L., Lusardi, A., and Panos, G. A. 2012. *Financial Literacy and the Financial Crisis*. NETSPAR Discussion Papers, 03/2012-007, 1-52.
- Lachance, M., Tang, N. 2012. *Financial advice and trust*. Financial Services Review, Vol. 21, pp. 209-226.
- Lusardi, A., Mitchell, O.S. 2007. *Financial literacy and retirement preparedness: Evidence and implications for financial education*. Business Economics, Vol.42, Iss.1, pp.35-44.



- Lusardi Annamaria and Tufano Peter 2009. *Debt Literacy, Financial Experiences, and Over-indebtedness*. National Bureau Of Economic Research (NBER), Working Paper: 14808.
- Mandell, Lewiss and Klien, Linda Schmid. 2007. *Motivation and Financial literacy*. Financial Service Review 16, pp 105-116.
- Mathi, M. K., and Kunkumapriya, A. (2014). *Review of Literature on Investment Behaviour of Rural Investors*. International Journal of Science and Research, 3(14), 351-353.
- Noctor, M., Stoney, S., and Stradling, R.. 1992. *Financial Literacy: A Discussion of Concepts and Competences of Financial Literacy and Opportunities for its Introduction into Young People's Learning*, report prepared for the National Westminster Bank. National Foundation for Education Research. London.
- Olsen, R. 2008. *Cognitive Dissonance: The Problem Facing Behavioural Finance*. The Journal of Behavioural Finance. 9. 1-4.
- Olsen, R. and Cox, C. 2001. *The Influence of Gender of the Perception and Response of Investment Risk: The Case of Professional Investors*. The Journal of Psychology and Financial Markets, 2(1), 29-36.
- Pak, Olga and Monowar Mahmood. 2012. *Impact of personality on risk tolerance and investment decisions: A study on potential investors of Kazakhstan*. International Journal of Commerce and Management, Vol. 25 Issue: 4, pp.370-384.
- Parker, A. M., W. B. Bruin, J. Yoong, and R. Willis. 2012. *Inappropriate confidence and retirement planning: Four studies with a national sample*. Journal of Behavioural Decision Making, vol. 25, pp. 382- 389.
- Pompian, M. M. 2016. *Risk profiling through a behavioural finance lens*. Virginia, Charlottesville: CFA Institute Research Foundations.
- Roszkowski, M.J. 1998. *Risk Tolerance in financial decisions*.
- Sabri, N.A.A. 2016. *The Relationship between the Level of Financial Literacy and Investment Decision-Making Millennials in Malaysia*. Taylor's Business Review, Vol 6, August 2016.
- Tang, N., and A. Baker. 2016. *Self-esteem, financial knowledge and financial behaviour*. Journal of Economic Psychology, 54. 164–176.
- Trone, D. B., Allbright, W. R. and Taylor, P. R. 1996. *The management of investment decisions*. Chicago: Irwin.



- Van Rooij, M., Kool, C.J.M. and Prast, H.M. 2007. *Risk-return preferences in the pension domain: are people able to choose?*. Journal of Public Economics, Vol. 91 Nos 3/4, pp. 701-722.
- Van Rooij, Maarten, Annamaria Lusardi, and Rob Alessie. 2007. *Financial literacy and stock market participation*. NBER Working Paper No. 13565 (National Bureau of Economic Research).
- Vitt, L. A., Anderson, C., Kent, J., Lyter, D. M., Siegenther, J. K., and Waerd, J.. 2000. *Personal finance and the rush to competence*. Financial literacy education in the U.S. Middleburg VA. Institute for socio-financial services.
- Von Neumann, J., and Morgenstern, O. 1947. *The theory of games and economic behaviour*. Princeton: Princeton University Press.