

Majors: FIN
Major No. F/15

*The impact of financial literacy and risk
tolerance on investment decisions: an analysis
of gender differences*



By:

Eman Fatima

01-321211-007

Supervisor:
Dr. Sajid Ali

Department of Business Studies

Bahria University Islamabad

Spring 2022

FINAL PROJECT/THESIS APPROVAL SHEET
Viva-Voce Examination

Viva Date: 01/08/2022

Topic of Research: The impact of financial literacy and risk tolerance on investment decisions: an analysis of gender differences

Names of Student(s):

- Eman Fatima 01-321211-007

Class: MBA 1.5 (Weekend)

Approved by:

Dr. Sajid Ali
Supervisor

Dr. Abdullah Hafeez
Examiner-I

Muhammad Akram
Examiner-II

Dr. Syed Haider Ali Shah
Research Coordinator

Dr. Khalil Ullah Mohammad
Head of Department
Business Studies

ABSTRACT

This study examines the impact of financial literacy and risk tolerance on investment decisions made by men and women. It explores the role of risk tolerance as a mediator in relation to financial literacy and individual investment decisions. The survey data collection was performed on 233 respondents 111 females and 122 males with a self-administered questionnaire. This research represents the fact that financial literacy has a positive and significant relationship with risk tolerance, and investment decisions are strongly influenced by it. Risk tolerance has a positive and insignificant impact on investment decisions.

The results indicate that gender differences in financial risk tolerance are explained by gender differences in the individual determinants of financial risk tolerance. Financial literacy can also help in achieving success, and it is fruitful in providing profitable plans for people.

ACKNOWLEDGEMENT

I would like to express my deepest appreciation to all those who provided me the possibility to complete this research. I am grateful to all of those with whom I have had the pleasure to work during this and other related projects. Each person in my surrounding has provided me extensive personal and professional guidance and taught me a great deal about both scientific research and life in general. I would especially like to thank to my Supervisor Dr. Sajid Ali as he is my teacher and mentor, he has taught me more than I could ever expect. I would like to thank my parents, whose love and guidance are with me in whatever I pursue.

DEDICATED

TO

My Father (Khalid Pirzada)

&

My Mother (Aisha Yasmeen)

Table of Contents

| | |
|---|----|
| Keywords | x |
| Chapter 1 | 1 |
| 1. Introduction | 1 |
| 1.1. Problem statement | 4 |
| 1.2. Research Gap | 4 |
| 1.3. Research questions | 5 |
| 1.4. Research Objectives | 5 |
| Chapter 2 | 6 |
| 2. Literature Review | 6 |
| 2.1. Theoretical Background | 6 |
| 2.2. Financial literacy | 7 |
| 2.3. Investment Experience | 8 |
| 2.4. Risk tolerance | 9 |
| 2.5. Investment decisions | 11 |
| 2.6. Gender differences | 12 |
| 2.7. Research Framework | 13 |
| 2.8. Hypothesis | 13 |
| Chapter 3 | 14 |
| 3. Proposed Research Methodology | 14 |
| 3.1. Population Frame | 14 |
| 3.2. Sample Selection | 14 |
| 3.3. Unit of Analysis | 14 |
| 3.4. Type of Study | 14 |
| 3.5. Time horizon | 14 |
| 3.6. Instrument Selection | 14 |
| 3.6.1. Definition | 15 |
| 3.7. Proposed Data Collection Procedure | 15 |
| 3.8. Proposed Data Analysis Technique | 15 |
| 3.9. Pilot testing | 16 |
| 3.9.1 Reliability of data | 16 |
| Chapter 04 | 18 |
| 4.1. Results and Analysis | 18 |

| | |
|---|----|
| 4.1.1. Demographics | 18 |
| 4.1.1.1. Gender Statistics of Respondents | 18 |
| 4.1.1.2. Age Level Statistics of Respondents | 19 |
| 4.1.1.3 Education level statistics of Respondents..... | 20 |
| 4.1.1.4. Experience level Statistics of Respondents..... | 21 |
| 4.1.1.5. Income level statistics of Respondents..... | 22 |
| 4.1.1.6. Family level statistics of Respondents | 23 |
| 4.2. Outer Loading | 24 |
| 4.3. Descriptive Statistics | 26 |
| • Males statistics | 26 |
| • Females statistics | 28 |
| 4.3. Reliability analysis | 29 |
| 4.4. Correlation analysis | 30 |
| 4.5. Multicollinearity | 31 |
| 4.6. Validity Analysis | 31 |
| 4.7. Regression analysis | 32 |
| 4.7.1. Hypothesis Testing..... | 33 |
| <i>Chapter 5</i> | 37 |
| 5.1. Conclusion and Discussion | 37 |
| 5.1.1. Discussion..... | 37 |
| 5.1.1.1. Financial Literacy & Risk Tolerance | 37 |
| 5.1.1.2. Financial Literacy and Investment Decisions | 37 |
| 5.1.1.3. Risk Tolerance & Investment Decisions..... | 37 |
| 5.1.1.4. Mediation of risk tolerance on financial literacy and investment decisions | 38 |
| 5.1.1.5. Relationship between FL & RT on men and women | 38 |
| 5.2. Conclusion..... | 38 |
| 5.3. Limitation and future recommendations | 39 |
| 5.4. Scientific contribution of Research..... | 39 |
| 5.4.1. Industrial Contribution | 39 |
| 5.4.2. For Society | 39 |
| 6. References | 40 |
| 7. Questionnaire | 43 |

List of Tables

| | |
|---|----|
| Table 1.1 Definition of variables | 15 |
| Table 2 Reliability of FL | 16 |
| Table 3 Reliability of ID | 17 |
| Table 4 Reliability of RT | 17 |
| Table 5 Gender Statistics | 18 |
| Table 6 Age Statistics | 19 |
| Table 7 Education Statistics | 20 |
| Table 8 Experience Statistics | 21 |
| Table 9 Income statistics | 22 |
| Table 10 Family statistics | 23 |
| Table 11 Measurement Model Outer Loadings | 24 |
| Table 12 Males Descriptive Statistic | 26 |
| Table 13 Females Descriptive Statistic | 28 |
| Table 14 Cronbach Alpha | 29 |
| Table 15 Correlation table of males | 30 |
| Table 16 Correlation table of females | 30 |
| Table 17 Multicollinearity | 31 |
| Table 18 Construct Reliability and Validity | 31 |
| Table 19 Fornell-Larcker Criterion for Males | 32 |
| Table 20 Fornell-Larcker Criterion for Females | 32 |
| Table 21 R square | 33 |
| Table 22 β's and p values | 34 |
| Table 23 Special indirect effect | 35 |
| Table 24 Total effect | 36 |

List of Figures

| | |
|--|----|
| Figure 2.1 Research Framework | 13 |
| Figure 2 Gender Chart | 19 |
| Figure 3 Age chart | 20 |
| Figure 4 Education Chart | 21 |
| Figure 5 Experience Chart | 22 |
| Figure 6 Income chart | 23 |
| Figure 7 Family chart | 24 |
| Figure 8 Males Mediating Path | 34 |
| Figure 9 Females Mediating Path | 35 |

ABBREVIATIONS

| | |
|------------|---------------------------|
| FL | Financial Literacy |
| ID | Investment Decisions |
| RR | Financial Risk |
| FRT | Financial Risk Tolerance |
| RT | Risk Tolerance |
| FDM | Financial Decision Making |
| IE | Investment Experience |
| FP | Financial Planning |
| DV | Dependent Variable |
| IV | Independent Variable |
| ETC | et cetera |
| i.e. | id est |
| et al. | et alii |
| crf. / cf. | cross reference |

Keywords

Financial Literacy (FL), Investment Experience (IE), Risk Tolerance (RT), Investment Decisions (ID) and gender difference

Chapter 1

1. Introduction

The investment decision process is a crucial process depending on different factors which can vary from person to person. With every kind of decision in life, people often behave differently. Some investors may take decisions based on their judgement, while some may consider other factors that lead them to make the right decisions. Risk tolerance is the maximum amount of risk that will be received while making investment decisions (Grable, Environmental and Biopsychosocial Profiling as a Means for Describing Financial Risk-Taking Behavior, 2008) (Grable & Joo, Environmental and biopsychosocial factors associated with financial risk tolerance, 2004). The Decision-making procedure becomes easy when investors correctly identified the each confounding variables. These variables lead towards the right decision so losses can be avoided or reduced in future.

Studies shows that individuals who are financial literacy are capable of more tolerant of risk ((Grable & Joo, How To Improve Financial Knowledge, Attitudes, And Behaviors Among Consumer Science Constituencies, 1999), (Grable J. , 2000), (Roszkowski & Grable, 2008).The decisions that investors take on misleading information, or on the basis of poorly analyzed information, can produce imperfect results. Investment made as an expense now can generate profit in the future. Capital expenditures are made to make a profit and can be made in two ways. The first form consists of investments in tangible assets such as buildings, machinery or systems. While the second financial investment can be like stocks, bonds, etc. Both forms of investment can lead a business to success.

In today's world better lifestyle & financial well-being take priority among people & the global capital market offers a variety of financial products is proving to be an important means of achieving these personal goals & financial planning becomes a good practice even a necessity. A solid financial plan allows people to become aware of how to handle financial matters. In recent years, it has become interesting to study the relationship between FL, FDM & FRT.

Some studies shows that financial literate people are good in FDM process. The researchers revealed that the main reason anybody can avoid investing is people don't have sufficient financial knowledge due to which they don't have enough confidence in themselves (Jureviciene & Jermakova, 2012). The study shows that financial literate individuals and the person who knows that stocks and mutual funds are different are willing to take risk in their investment but individuals who don't have enough knowledge about FL and stock market are not willing to take risk (Afiqah & Sabri, 2016).

Concept of financial information also have some extra effect of financial behavior of an individual. Estimated financial information or trust are strongly correlated with decisions about finance. (Allgood & Walstad, 2013) (Tang & Baker, 2016). In fact, the results shows that the correlation is weak between financial knowledge and perception (Lusardi & Mitchell, Financial Literacy: evidence and implication on financial education, 2009).

According to Miller, Godfrey, Levesque, and Stark (2009), FL makes individuals familiar with various financial terms. At the macro level, the personal savings of individuals have benefited the entire nation. Savings helps the government to spend that money on development projects & financial intermediaries help to boost corporate investments. Corporate investments generate higher productivity and efficiency which have a positive effect on economic growth. The interesting part is these savings protect the nation from economic downturns & financial crises. The people who study finance generally save more money & make profitable decisions to invest their excess funds (Gale, Harris, & Levine, 2012). As financial markets are now globally integrated it become more important for investors to be more aware & informed about how to monitor & manage their finances. As a result of the integration of financial markets around the world, it become essential for investors to be more competent in managing their finances.

Trone, Allbright, and Taylor (1996) indicates that it is very difficult to measure the individuals FRT because RT is a multidimensional attitude & difficult concept to be influenced by many factors that affect individual's willingness to take FR.

Due to lack of experience sometimes there is less innovation in decision-making & investors invest in the security which is comparatively high risked security. People with lower literacy levels are more likely to take financial advice from their friend & family.

The financial situation of today's youth shows a high level of debt. (ROBERTS & JONES , 2001). A gap typically found between what individuals think they know and the precise measure of financial literacy (Agnew & Szykman, 2010).

Two well-known economists, George Stigler and Gary Becker, suggested that "flavors do not change randomly or differ significantly between people" (Stigler & Becker, 1997). The authors tried to defend this bold proposal with different cases where different prices, incomes, and amounts of information available at different times or for different people could provide an explanation for why behaviors changed between people or differed without resort to differences the likes as an explanation.

Risk is classified as an internal component of an asset in many macroeconomic models, but the prospect theory states it differently, it mentioned that only asset is not important but the investors also play an important role or it can be stated that it is correlated to the amount of wealth they have. The investors who have more amount of wealth have more ability to tolerate risk than the investors who don't have enough wealth. As a result, RT is always increases when the wealth of an investor increased. (Chaulk, Johnson, & Bulcroft , 2003). In addition, life experiences of an individuals are also play a vital role in the RT level of an investors besides the amount of wealth they have.

Investor wealth, investment goals, risk attitude and investment time horizon have been shown to be the most important elements of asset class choices (Butler & Domian, 1991). For families where financial assets just represents a small portion of total wealth, research shows that the asset classes with the maximum expected returns should be chosen. Hanna and Chen found that investing in small stocks is ideal for almost all households with a time horizon of at least 5 years. Younger households have been recommended to pick riskier assets than older households, who have smaller time horizons and might not be able to withstand market volatility. In addition, (Sung & Hanna, 1996) suggested that investment RT should be associated to the number of years to expected retirement.

Several recent studies have reported that women were more risk-averse and chose less risky retirement savings than men (Sung & Hanna, 1996), (Bajtelsmit & VanDerhei , 1997). Women mostly choose less risky assets as compared to men. It is also expected that women invest higher amount in low risk, lower return assets, such as CD & houses.

(Sung & Hanna, 1996) Found that mostly un-married women are less risk-averse than un-married men & married couples. Sung (1997) found that women's investment decisions are based on the level of RT of their partners and they mostly invest in stocks. (Bajtelsmit & VanDerhei , 1997) Used data of pension funds (1993) to identify gender differences in pension allocation. (Bajtelsmit & VanDerhei , 1997) Found that women choose the guaranteed interest fund significantly more often, while men chose employer stocks. (Bajtelsmit, Bernasek, , & Jianakopolos, 1996) To find the gender differences in RT used the SCF 1989, research also looked at how much they invested in risky pension asset.

FP involves the effective use of personal savings to generate further wealth & then the distribution of that wealth in future. This planning indicates the current state if people & how people find & develop their ability to meet the financial needs e.g. insurance. (Malaysia Financial Planning Council, 2004). To achieve the desired well-being and lifestyle it is very important that people continually reviewed the impact of their financial affairs on their financial health of the resources needed to support in the future. (Lee & Ong, 2001).

1.1. Problem statement

Financial literacy is of great importance. Due to the complex nature of financial markets today, it become tough to take perfect financial decisions without any financial knowledge. In Pakistan, the need for financial education for people with limited resources is high as insufficient knowledge can cause investment problems. Financial knowledge is important for people to understand how to carry out financial activities with proper planning (Arif, 2015). This study examines the impact of FL on RT behavior and investment decisions.

1.2. Research Gap

As the economy of Pakistan is not very strong & there is also political instability, investors should be cautious about chasing risk and making risky investments. Income level also plays a vital role in decisions, but political and economic conditions make them aware of whether to invest or not, as the economic condition of the country is influenced by political circumstances. Researchers always try to figure out the factors affecting the

decision-making process, but in Pakistan, the situation differs from other countries in many ways (Awais, Laber, Rasheed, & Khursheed, 2016). So here it is important to examine the variables which help investors to make decisions such as qualification, income, financial literacy & past investment experiences. In this study, we start with financial literacy and investment experiences and then we discuss how these factors have an impact on risk tolerance and investment decisions. Investment experience turns out to be the best take for risky assets as it builds investor confidence. Investors with experience have a portfolio of bad & good experiences. A wise investor learns from past experiences. This research is also proving valuable in exploring these effects. It also helps the investors to know how much information they should have to deal with risky situations and how their experience helps them in managing risky investments. In Pakistan, we have to identify the factors influencing the decision-making process & additional investigations are needed to find more elements that affects investment decisions.

1.3. Research questions

- Do individuals differ in their financial literacy skills when making investment decisions?
- Does risk tolerance change the relationship between financial literacy and investment decisions?
- Do individuals differ in their tolerance for financial risk due to their level of financial literacy?

1.4. Research Objectives

The research work has the following primary objectives to:

- Find out how financial literacy affects investment decisions.
- Examine the function of risk tolerance in mediating the relationship between financial literacy and investing decisions
- Examine whether men are more risk taker and women are risk averse in nature

Chapter 2

2. Literature Review

2.1. Theoretical Background

RT and its relation with decision making regarding investment of investors are explained by two main theoretical perspectives.

- First is the traditional financial model (**normative model**), it assumes rational behavior of investors are determined how they make decisions in expected utility theory. (Von Neumann and Morgenstern, 1947). The theory is the most popular model (Grable J. E., Risk Tolerance, 2008)
- Second is Behavior Finance Theory (**descriptive model**). This theory opposes the assumption of rational behavior and it assumes that all individuals are irrational and behavioral and cognitive biases are always involved in their decisions (Dreu & Bikker, 2012). Behavior Finance has received more attention with leading theories such as Prospect Theory (Bazerman, 1984) this theory explains that in the eyes of individuals advantages and disadvantages have different explanation and the RT level if the investors are always correlated how the problem is explained or framed (i.e. the problem of framing).

In The Theory of Reasoned Behavior as expressed by (Ajzen & Fishbein, 1975) this theory explained that investors may act rationally on the information when it is properly available to them. (Ajzen, The theory of planned behavior, 1991) Further suggests that the intention to engage in any kind of behavior is stronger when the performance is up to mark. Many studies who have financial products as a part of their study usually used investment intention as their dependent variable including Dey et al. (2015) (Kozup et al., 2008; Lim et al., 2013). Lim et al. (2013) done research in Singapore market and the result of research shows that the relation between market investment intention and risk aversion is negatively correlated.

2.2. Financial literacy

The term financial literacy was first used in U. S. in 1787, when John Adams acknowledged the need for financial literacy, to prevalent confusion and distress in America caused by ignorance of credit, circulation, and the nature of currency. (Financial Corps, 2014). Since then, various developments have taken place and the term FL has been used frequently by different researchers, organizations and governments and has been approached in different ways (HUNG, PARKER, & YOONG, 2009). Mandell (2007) defined FL as “the ability to evaluate the new and complex financial instruments and make informed judgments in both choice of instruments and extent of use that would be in their own best long-run interests”. (Lusardi & Tufano, Teach Workers about the Perils of Debt, 2009) Stated that knowledge of debt is an important part of financial literacy and thus includes the ability to make simple decisions related to debt and to apply knowledge of compound interest in real life situations.

There are many definitions of FL which are given by different researchers, including Servon and Kaestner (2008), who defined FL as how well a person understand and apply the financial concepts where needed. Furthermore, Lusardi and Mitchell (2011) stated that people with high knowledge of FL also know about compound interest rates. (Agarwalla, Barua, Jacob, & Varma, 2013) State that people who understand FL also know about the time value of money and actively participate in stock markets. (Klapper, Lusardi, & Panos, 2012).

Some studies shows that financial literate people are good in FDM process. The researchers revealed that the main reason anybody can avoid investing is people don't have sufficient financial knowledge due to which they don't have enough confidence in themselves (Jureviciene & Jermakova, 2012). The study shows that financial literate individuals and the person who knows that stocks and mutual funds are different are willing to take risk in their investment but individuals who don't have enough knowledge about FL and stock market are not willing to take risk (Afiqah & Sabri, 2016).

Concept of financial information also have some extra effect of financial behavior of an individual. Estimated financial information or trust are strongly correlated with decisions about finance. (Allgood & Walstad, 2013) (Tang & Baker, 2016)). In fact, the results shows that the correlation is weak between financial knowledge and perception (Lusardi & Mitchell, Financial Literacy: evidence and implication on financial education, 2009)

There are many definition of FL is present in the literature. E.g. FL can be defined as overall understanding about the economy where you live, and ability to properly manage your money (Gallery, Newton, & Palm, 2011). It can be described by different terms such as in US they named it Financial Capability, but it contains different kinds of components such as skills, attitudes & knowledge about the finance. (Gallery, Newton, & Palm, 2011). Some more definitions are " ability of someone to make judgements correctly and right & timely decisions about use of their money and how to manage it (Schagen and Lines, 1996; Noctor, Stoney, and Stradling, 1992), that have been generally accepted (Galeri, 2011).

Vitt (2005) presented FL in more detail, FL is the ability of an individual to read, manage, write and analyze financial situation about their life.(Mandell & Klein, 2007) Further state FL as it also covered several aspects of finance such as knowledge about personal finance, how to manage money, credit, savings, investment and risk. FL on an individual is directly correlated with the individual's financial behavior. (Gustafsson & Omark, 2015). When FL is increased in any individual it helps him to take effective and timely financial decisions.(Bernheim, Garrett, & Maki, 2001). Al-Tamimi and Al Anood (2009) note that, in developing countries investors don't have enough knowledge of issues in money and investment decisions. Some researchers also published literature about identifying the factors due to which financial knowledge and investment decisions are classified separately. In developing countries lack of FL is very common. Some studies results indicates that usually people don't have enough knowledge about the financial products in developing countries so the public hesitate in investing in financial products.(Honohan, 2008).

2.3. Investment Experience

Due to lack of experience sometimes there is less innovation in decision-making & investors invest in the security which is comparatively high risked security. As one study shows, people are not saving enough for retirement, and as a result they take on more debt and do not benefit from financial advances (Lusardi & Mitchell , 2007)People with lower literacy levels are more likely to take financial advice from their friend & family. The financial situation of today's youth shows a high level of debt. (ROBERTS & JONES , 2001)A gap typically found between what individuals think they know and the precise measure of financial literacy (Agnew & Szykman, 2010). Chou et al., 2010 emphasize that investor behavior is influenced

by past experience. A seasoned investor is more likely to choose a risky portfolio because of experience. A good or not better investor's experience affects the level of risk tolerance and investment decisions of investors. Successful investment experience in the past that promises a high risk tolerance that obviously generates high returns. Thus, past investment behavior is positively related to risk tolerance, which appears to have an impact on investment decisions.

2.4. Risk tolerance

FR is defined as uncertain possible return distribution. The risk is higher when the variance of security is greater in number.(A.Olsen, 2008). One of the most important factor that every investor have should be the ability to tolerate risk if he wants to succeed. While selecting assets allocation, securities & strategic plans individual's RT is the main characteristic, so that RT assessments talk more about plans for future goals (Grable & Lytton, Assessing The Concurrent Validity Of The SCF Risk Tolerance Question, 2001).

According to (Kogan & Wallach, 1964) RT is the ability of an individual investors while taking ID where they have some goal behind but it is unclear that they achieve it or not. There is a possibility of loss in it, in (Grable J. E., Risk Tolerance, 2008). RT level of an investor is affected the decisions of investors who invest their money for short term and long term goals. Not all investors have same level of RT, every investors have different levels of RT and they also behave differently while making decisions about their investment. Furthermore (Cordell, 2001) divides investment RT into four different elements: attitudes towards risk, financial ability to bear risk, knowledge, and the tendency for secrecy. We don't measure RT in numbers but it don't remain same throughout it may change for individuals time to time. In good times when the assets price rises investors become more risk taker but when there is some issue and bad time started RT level of investors usually become very low.(Grable J. , Lytton, Neill, Joo, & Klock, 2006)

Two well-known economists, George Stigler and Gary Becker, suggested that "flavors do not change randomly or differ significantly between people" (Stigler & Becker, 1997). The authors tried to defend this bold proposal with different cases where different prices, incomes, and amounts of information available at different times or for different people could provide an explanation for why behaviors changed between people or differed without resort to differences the likes as an explanation. However, it seems that there will be differences in

actual RT based on cultural status, age, or educational differences; however, these differences have been reported in studies using the measure of investment risk tolerance. (Yao, Gutter, & Hanna, 2005) And (Wang & Hanna , 2007)found that Blacks and Hispanics were more likely to be unwilling to take investment risk than comparable whites, but also more likely to take investment risk.

However, (Roszkowski, 1998) in (Grable & Lytton, Assessing The Concurrent Validity Of The SCF Risk Tolerance Question, 2001) stated that to measure individuals RT levels is not an easy process. This is due to RT is not easy to understand and the concept of RT is usually unclear. Hallman and Rosenbloom (1987), added that investor RT tends to be subjective rather than objective, and it is very difficult to measure because RT of investors refer how an investor act to the stock prices when there is a lot of volatility and how well he controls his emotions and attitude while facing risk. This opinion is reinforced by (Trone, 1996) who stated that ability to achieve the desired objective of an investment is mostly influenced by the emotional ability how well he accepts e loss possibility in the value of his portfolio. (Pak & Mahmood, 2012) research supports what was conveyed by (Trone, 1996) that all individuals are irrational and also behave irrationally in every situation sometimes they are searching for opportunity and ready to take high level of risk while making decisions regarding their investment. It is the responsibility if government to control this type of behavior of investors and take effective steps otherwise, the stock market can "balloon".

Risk is classified as an internal component of an asset in many macroeconomic models, but the prospect theory states it differently, it mentioned that only asset is not important but the investors also play an important role or it can be stated that it is correlated to the amount of wealth they have. The investors who have more amount of wealth have more ability to tolerate risk than the investors who don't have enough wealth. As a result, RT is always increases when the wealth of an investor increased.(Chaulk, Johnson, & Bulcroft , 2003). In addition, life experiences of an individuals are also play a vital role in the RT level of an investors besides the amount if wealth they have.

Factors Associated with RT and predicting attitudes toward FRT in the field of financial planning and primarily contains the use of demographic and socioeconomic factors (e.g., gender, age, financial status, etc., marriage, Salary). The usage of these variables in place of

various measures may be because there is very less developed application models of the main factors influencing FRT attitudes and FP. Demographic and socioeconomic factors also tend to be more accessible to FP and counseling researchers, as other measures of predisposing factors are unspecified and standardized in large databases. Hawley and Fujii (1993-1994) and (Kennickell, McCluer, & Sunden, 1997) conc. Keep in mind that, in general, certain demographic, environmental, and socioeconomic characteristics can foresee RT. (Sung & Hanna, 1996)and (Grable & Lytton, 1998) agree. Sung and Hanna find that gender, marital status, ethnicity, and education predict risk tolerance. (Grable & Lytton, 1998) Find that education and gender predict attitudes toward RT. Factors such as age also appear to be related to FR taking.

Risk tolerance is very important for an investors while taking some personal financial decisions. (Roszkowski & Snelbecker, 1990), as quoted in (Grable J. E., Risk Tolerance, 2008). RT and it's relation with decisions regarding investment is explained by two theories: traditional finance (normative theory) and behavior finance (descriptive theory) (Grable J. E., Risk Tolerance, 2008). In general, normative model explain how investors take decisions regarding their investment rationally, while descriptive model explain why investors decisions regarding their investments are irrational.(Grable J. E., Risk Tolerance, 2008)

2.5. Investment decisions

Investor wealth, investment goals, risk attitude and investment time horizon have been shown to be the most important elements of asset class choices (Butler & Domian, 1991). For families where financial assets just represents a small portion of total wealth, research shows that the asset classes with the maximum expected returns should be chosen. Hanna and Chen found that investing in small stocks is ideal for almost all households with a time horizon of at least 5 years. Younger households have been recommended to pick riskier assets than older households, who have smaller time horizons and might not be able to withstand market volatility. In addition, (Sung & Hanna, 1996) suggested that investment RT should be associated to the number of years to expected retirement. (Guiso, Jappelli, & Terlizzese, 1996) Found that education, income, & wealth all are positively correlated with investing in risky assets. Women normally have less earnings than men, which would result in lesser total wealth. (Sung & Hanna, 1996) Proposed that families which have less total wealth than 3

three months of income are not able to invest in risky assets because of volatility in market. They also noted that risky assets may not be appropriate for people with short-term goals. Several recent studies have reported that women were more risk-averse and chose less risky retirement savings than men ((Sung & Hanna, 1996); (Bajtelsmit & VanDerhei , 1997). Women mostly choose less risky assets as compared to men. It is also expected that women invest higher amount in low risk, lower return assets, such as CD & houses.

Beck (2004) states that it is also important to consider intention if investors for adoption of an action on several other actions where the investors know the result for his each action. Hanafiah et al.(2016) research results shows that the relationship between economic benefits and intrinsic rewards with the intention to invest is positive. Intrinsic appreciation is always measure by the self-satisfaction and the personal achievement of the investors. Research shows that intrinsic rewards plays the most vital role in determining the intention of the entrepreneur to invest in near future. (Hanafiah et al., 2016). More explicitly, Calvart and Campbell (2007) state that the relation between knowledge and the financial behavior is positive.

2.6. Gender differences

(Sung & Hanna, 1996) Found that mostly un-married women are less risk-averse than un-married men & married couples. Sung (1997) found that women's investment decisions are based on the level of RT of their partners and they mostly invest in stocks. (Bajtelsmit & VanDerhei , 1997) Used data of pension funds (1993) to identify gender differences in pension allocation. (Bajtelsmit & VanDerhei , 1997) Found that women choose the guaranteed interest fund significantly more often, while men chose employer stocks. (Bajtelsmit, Bernasek, , & Jianakopolos, 1996) To find the gender differences in RT used the SCF 1989, research also looked at how much they invested in risky pension asset. (Bajtelsmit, Bernasek, , & Jianakopolos, 1996). Found that women are more risk-averse than men as their investment is risky pension funds decreased as their wealth increase, and men mostly own risky assets. (Yuh & Hanna , 1997) Used SCF (1992) data to find the demand towards risky assets in retirement portfolios. The sample includes people aged less than 70 who have not yet retired. They found that male-oriented families mostly invest in risky assets in their retirement portfolio while female-oriented families invest in less risky assets.

2.7. Research Framework

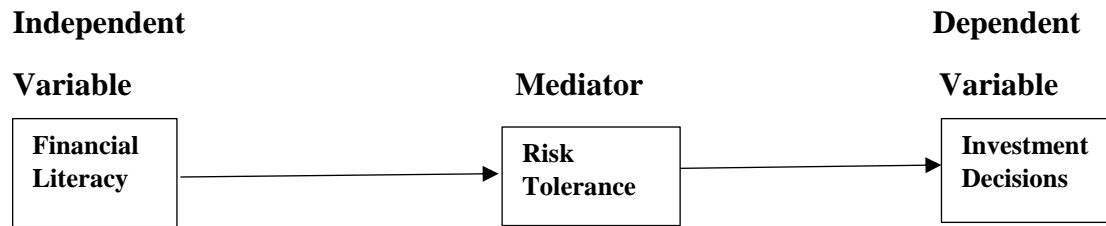


Figure 1 Research Framework

2.8. Hypothesis

- H1: There is a positive relation between financial literacy & risk tolerance
- H2: There is positive relation between financial literacy & investment decisions
- H3: There is a positive relation between risk tolerance & investment decisions
- H4: RT mediates the relationship between financial literacy and investment decisions
- H5: Men are more risk taker as compared to women

Chapter 3

3. Proposed Research Methodology

3.1. Population Frame

The population for this research was be residents of Islamabad and Rawalpindi because it is convenient for researcher to collect data from Rawalpindi and Islamabad. The questionnaire was distributed among respondents available in the Islamabad and Rawalpindi through email.

3.2. Sample Selection

The convenience sampling was adopted for the data collection and gather the information of individual respondents.

3.3. Unit of Analysis

The unit of analysis is the individual person. It can be used on a gender basis, education level and income as well. There are total 233 respondents.

3.4. Type of Study

The type of study was exclusively be quantitative research. As the quantitative study focuses on measurements of objectives or analysis of numerical data collected through questionnaires and tested through statistical tools.

3.5. Time horizon

The proposed study was initiated in March 2022 and completed in all aspects by June 2022.

3.6. Instrument Selection

To conduct this study, structured questionnaire was used. The study is consist of one independent variable i.e. financial literacy. Further present study incorporates risk tolerance as mediating role and dependent variable as investment decisions. The 5 point Likert scale

was adopted from studies conducted in past, that will be starting from “strongly disagree” to “strongly agree”

3.6.1. Definition

Table 1 Definition of variables

| Names | Variables | Definition |
|----------------------|----------------------|---|
| Financial Literacy | Independent variable | Financial literacy is defined as the general public's awareness and knowledge of financial services, financial resource management, and various concepts that are considered very important for the general public awareness so that they can obtain information relating to various financial market terms such as interest rates, inflation, etc. (Gustafsson & Omark, Financial literacy's effect on financial risk tolerance, 2015) |
| Risk Tolerance | Mediating | RT is defined as a behavior of human where he is not able to predict the outcomes for his investment, these are uncertain, means possibility if loss is present. (Irwin, 1993) |
| Investment decisions | Dependent variable | ID is defined as the decisions which investor made about their funds to invest in the different opportunities which are present for them in market. Simply, deciding on which assets to invest the capital. (Awais, Laber, Rasheed, & Khursheed, 2016) |

3.7. Proposed Data Collection Procedure

The collection of data was mainly be done by both formal and informal ways. The data was collected through (mail, e-mail, and hardcopy). The questionnaires was made accordingly and will include all the perspectives that will help in analyzing the data. This was sent to the respondents of Islamabad and Rawalpindi.

3.8. Proposed Data Analysis Technique

Data analysis is consist of different steps that was contributed in generation of results and conclusion based on facts and findings. The quantitative data analysis was categorized further

in two parts that are inferential statistics and descriptive statistics. The descriptive statistics incorporates different statistical methods that are utilized by researcher to describe the population undertaken for the purpose of study. The frequencies, pie charts, graphs, and measure of central tendencies including mean mode and median are clear examples of descriptive statistics. It further helps in testing the reliability and validity of the instruments used. However inferential statistics is focused on making inferences regarding a population from observation and through analysis of the sample. Regression, correlation analysis, and structured equation modelling (SEM) was used for this study. Further the data that was collected and examined by using of different statistical software's including SPSS and PLS.

3.9. Pilot testing

Pilot study is used to check the reliability of questionnaire. The purpose is to minimize the errors from the research design and questionnaire before the final testing of the data. The pilot study is one of the important step to conduct in research .The pretesting of questionnaire through pilot testing helps to find out the biased questions from the questionnaire, eliminate them and select the result-generated questions for research. The required size of pretesting is between 25-100 questionnaire (Schindler & Cooper 2003) .In this current research 50 questionnaires out of 233 questionnaire are collected for pilot study.

3.9.1 Reliability of data

The below mentioned values of Cronbach alpha demonstrates the internal consistency or reliability of each of the items of questionnaire. The standard to check the reliability for its acceptability is ≥ 0.70 (Cronbach, 1951; Nunnaly, 1978; Christensen et al., 2015).

3.9.1.1 Financial Literacy

Table 2 Reliability of FL

| Reliability Statistics | |
|-------------------------------|---------------------|
| Cronbach's Alpha | No. of Items |
| 0.821 | 10 |

The value of Cronbach's alpha for FL is 0.821 and the total item for this variable are 10 .so the reliability of this variable is greater than 0.70 which shows the internal consistency is reliable.

3.9.1.2 Investment Decisions

Table 3 Reliability of ID

| Reliability Statistics | |
|-------------------------------|---------------------|
| Cronbach's Alpha | No. of Items |
| 0.756 | 29 |

The value of Cronbach's alpha for Investment Decisions is 0.756 and the total item for this variable are 29 .so the reliability of this variable is greater than 0.70 which shows the internal consistency is reliable.

3.9.1.3 Risk Tolerance

Table 4 Reliability of RT

| Reliability Statistics | |
|-------------------------------|---------------------|
| Cronbach's Alpha | No. of Items |
| 0.792 | 5 |

The value of Cronbach's alpha for Risk Tolerance is 0.792 and the total item for this variable are 5 .so the reliability of this variable is greater than 0.70 which shows the internal consistency is reliable.

Chapter 04

4.1. Results and Analysis

The previous chapters has discussed the methods or techniques used in current research for testing the theoretical model .this chapter will presents the results of the study .In the start of the chapter demographics of the respondents has been considered for analysis. The demographics contained the gender, age, qualification and experience of the respondents. After the demographics analysis, the descriptive analysis has been done which includes the reliability, regression. SPSS & smart PLS are used to obtain the results for this study. At first, the respondent's profile has considered for analysis.

4.1.1. Demographics

Demographics analysis includes age, gender, education and experience. The demographics composition of the sample includes people from Rawalpindi and Islamabad. We have responses from 233 respondents.

4.1.1.1. Gender Statistics of Respondents

Table 5 Gender Statistics

| | Frequency | Percentage |
|----------------|------------------|-------------------|
| Males | 122 | 52.36% |
| Females | 111 | 47.64% |

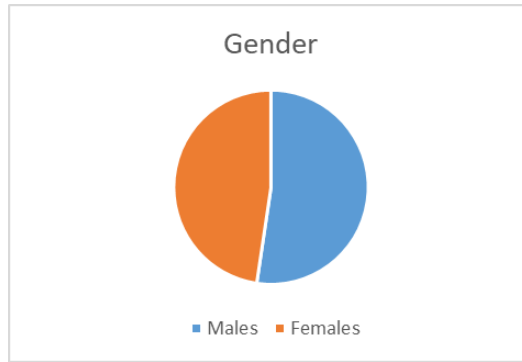


Figure 2 Gender Chart

The above-mentioned table of demographic represents the gender statistics of respondents. There are total 233 respondents out of which 122 are males and rest are females. The percentage for male respondents is 52.36% and female percentage is 47.64%.

4.1.1.2. Age Level Statistics of Respondents

Table 6 Age Statistics

| | Frequency | Percentage |
|-----------------------|------------------|-------------------|
| Under 18 | 9 | 3.86% |
| 19 – 25 | 72 | 30.90% |
| 26 – 33 | 132 | 56.65% |
| 34 & above | 20 | 8.59% |

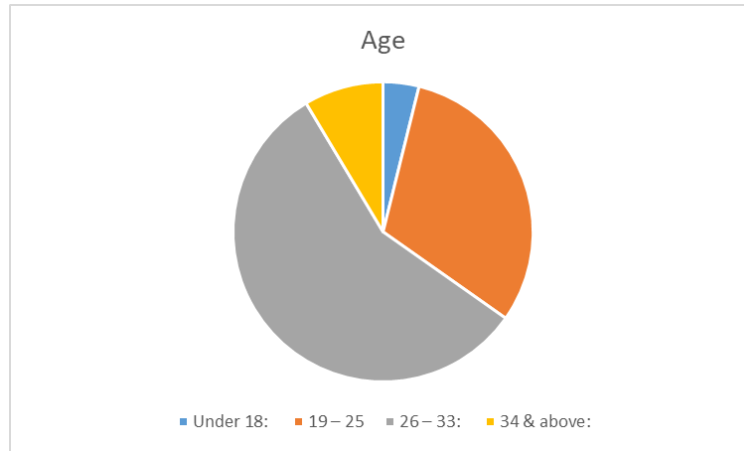


Figure 3 Age chart

The above table of demographic shows the age level statistics of respondents. Age has divided into 4 groups. The first group include age under 18. The second group include age from 19 to 25, the third group includes age from 26 to 33 and the last group includes age from 34 to above. So according to the age analysis nine respondents are from first group and their percentage is 3.86%. 72 respondents are fall in the second group that is between 19 to 25 and their percentage is 30.90% .there are 132 respondents from third group and their percentage is 56.65%. Last 20 respondents are above 34 age and their percentage is 8.59%.so this results shows that the highest number of age group who replied to the questionnaire are between the 26 to 33, which shows the overall percentage of 56.65% out of 100%.

4.1.1.3 Education level statistics of Respondents

Table 7 Education Statistics

| | Frequency | Percentage |
|---------------------|------------------|-------------------|
| Under matric | 0 | 0% |
| Matric | 6 | 2.57% |
| Intermediate | 16 | 6.87% |
| Graduate | 96 | 41.21% |
| Masters | 77 | 33.05% |
| M-Phil | 32 | 13.73% |
| PhD | 6 | 2.57% |

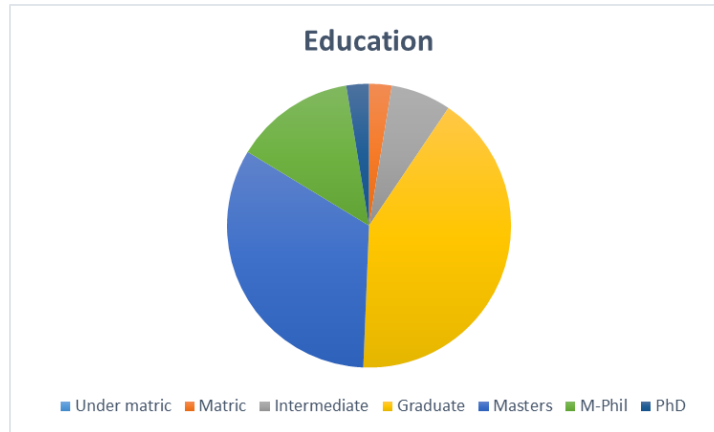


Figure 4 Education Chart

The above table shows the education level statistics of respondents. Education has divided 7 groups. The first group includes respondents under matric and their percentage is 0%. The second group include matric and their percentage is 2.57%. The third group includes intermediate level and their percentage is 6.87%. The fourth group includes graduates and their percentage is 41.21%. Fifth group includes masters and their percentage is 33.05%. Sixth group include M-Phil and their percentage is 13.73 and the seventh and the last group is PhD and there is 2.57%. Highest level of education who replied to the questionnaires are Graduates which shows the overall percentage of 41.21% out of 100%.

4.1.1.4. Experience level Statistics of Respondents

Table 8 Experience Statistics

| Years | Frequency | Percentage |
|-----------------------|------------------|-------------------|
| 1 – 5 | 175 | 75.11% |
| 6 – 10 | 52 | 22.32% |
| 11 & above | 6 | 2.57% |

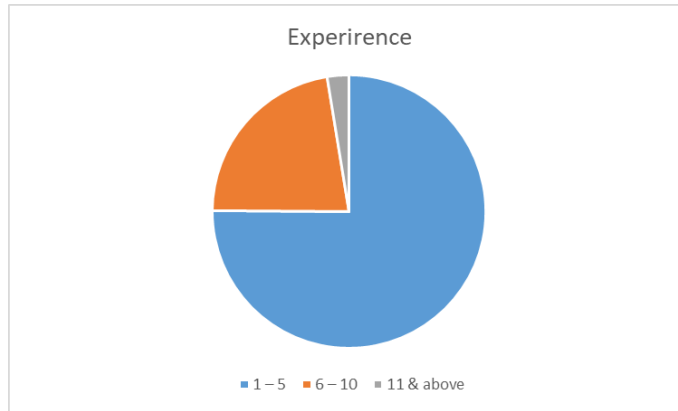


Figure 5 Experience Chart

The above table shows the experience of respondents. Among them 75.11%, respondents are those who have experience of 1 to 5 years and they are the highest percentage of respondent from 233. After those there are 52 respondents with the experience of 6 to 10 years, their percentage is 22.32%, and there is only six respondents with the highest experience of 11 to above.

4.1.1.5. Income level statistics of Respondents

Table 9 Income statistics

| | Frequency | Percentage |
|---------------|------------------|-------------------|
| 25000 – below | 0 | 0% |
| 25001 – 49000 | 118 | 50.64% |
| 49001 – 74000 | 76 | 32.62% |
| 74001 – 99000 | 18 | 7.73% |
| 99001 & above | 21 | 9.01% |

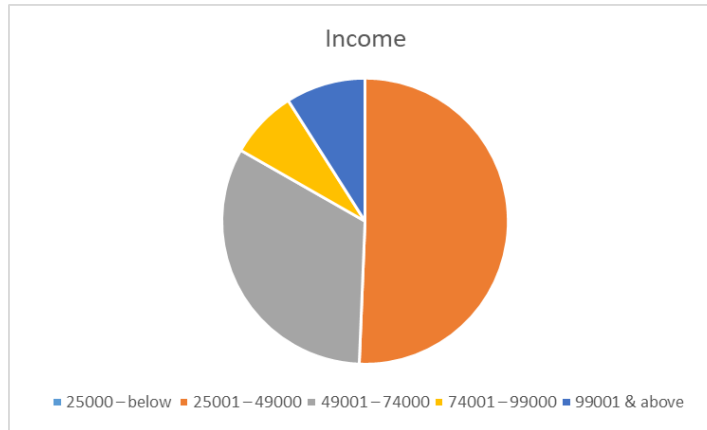


Figure 6 Income chart

The above table shows the income level statistics of respondents. Income has divided 5 groups. The first group includes respondents of income Rs.25000 - below and their percentage is 0%. The second group include Rs.25001-49000 and their percentage is 50.64%. The third group includes Rs.49001-74000 and their percentage is 32.62%. The fourth group includes Rs.74001-99000 and their percentage is 7.73%. Fifth and the last group is Rs.99001 & above and there is 9.01%.

4.1.1.6. Family level statistics of Respondents

Table 10 Family statistics

| | Frequency | Percentage |
|------------------------------|------------------|-------------------|
| Single | 121 | 51.93% |
| Married | 73 | 31.33% |
| Married with children | 35 | 15.02% |
| Divorce/Widow | 4 | 1.72% |

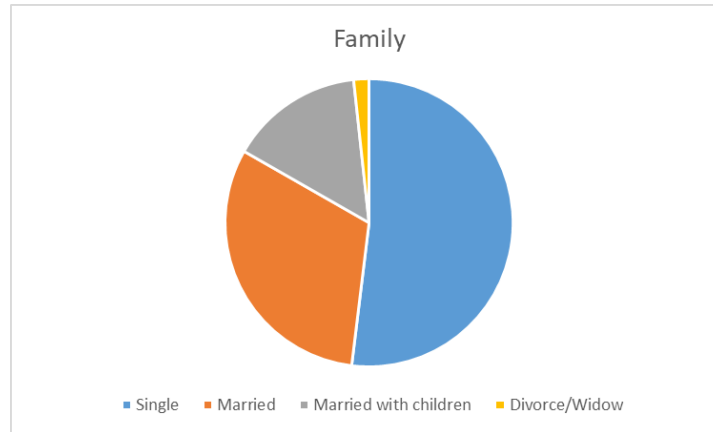


Figure 7 Family chart

The above and last demographic table shows the family of respondents. Among them 51.93%, respondents are those who are single and they are the highest percentage of respondent from 233. After those there are 73 respondents are married, their percentage is 31.33%, respondents who are married and have children are 35 and their percentage is 15.02% and there is only four respondent who are divorced/widow and their percentage is 1.72%.

4.2. Outer Loading

Table 11 Measurement Model Outer Loadings

| Factors & Items | Male | Female |
|---------------------------|-------|--------|
| Financial literacy | | |
| FL1 | 0.820 | 0.706 |
| FL2 | 0.721 | 0.852 |
| FL3 | 0.705 | 0.847 |
| FL4 | 0.781 | 0.761 |
| FL5 | 0.946 | 0.926 |
| FL6 | 0.882 | 0.846 |
| FL7 | 0.793 | 0.903 |
| FL10 | 0.834 | 0.782 |
| Risk Tolerance | | |
| RT1 | 0.952 | 0.771 |

| | | |
|-----------------------------|-------|-------|
| RT2 | 0.723 | 0.886 |
| RT3 | 0.793 | 0.846 |
| RT4 | 0.837 | 0.938 |
| RT5 | 0.786 | 0.783 |
| Investment Decisions | | |
| ID1 | 0.709 | 0.888 |
| ID2 | 0.707 | 0.929 |
| ID4 | 0.953 | 0.847 |
| ID5 | 0.893 | 0.789 |
| Managing tax | | |
| MT1 | 0.847 | 0.976 |
| MT2 | 0.786 | 0.803 |
| MT3 | 0.797 | 0.820 |
| Managing liabilities | | |
| ML1 | 0.851 | 0.783 |
| ML3 | 0.766 | 0.912 |
| ML4 | 0.795 | 0.884 |
| Managing insurance | | |
| MI1 | 0.814 | 0.758 |
| MI2 | 0.762 | 0.928 |
| MI3 | 0.821 | 0.705 |
| MI4 | 0.922 | 0.833 |
| Managing investment | | |
| MIN1 | 0.732 | 0.733 |
| MIN2 | 0.737 | 0.881 |
| MIN3 | 0.883 | 0.896 |
| MIN5 | 0.975 | 0.995 |
| Managing retirement | | |
| MR1 | 0.718 | 0.963 |
| MR2 | 0.714 | 0.712 |

| | | |
|------------------------|-------|-------|
| MR3 | 0.831 | 0.773 |
| Estate planning | | |
| EP1 | 0.821 | 0.767 |
| EP2 | 0.722 | 0.761 |
| EP3 | 0.955 | 0.869 |
| EP4 | 0.720 | 0.781 |

4.3. Descriptive Statistics

It is the basic representation of data and it describes the whole sample by simple and basic characteristics. The most common type of descriptive is mean median and mode. Descriptive statistics is used to analyze characteristics of data in quantitative terms. The test shows the central tendency of standard deviation and mean of the data. All items of construct has measured on 5 point Likert scale. To increase the visibility the results has presented in tables.

- **Males statistics**

Table 12 Males Descriptive Statistic

| Name of variables | N | Mean | Std. Deviation | Skewness | | Kurtosis | |
|--------------------------|----------|-------------|-----------------------|-------------------|-------------------|-------------------|-------------------|
| | | | | Statistics | Std. Error | Statistics | Std. Error |
| Financial Literacy | 122 | 2.2783 | .7088 | .667 | .160 | 1.211 | .320 |
| Investment Decisions | 122 | 2.2565 | .7123 | .884 | .160 | .822 | .320 |
| Risk Tolerance | 122 | 2.1374 | .7096 | .687 | .160 | 2.085 | .320 |

The above mention table shows the descriptive statistics of the research variables of the current research. The first independent variable is Financial Literacy which shows the mean value 2.2783 which is positive and fall under the prescribe range of 1 to 5 and the standard deviation value is 0.70887 which is good as per range of standard deviation which is from -1 to +1. The value of skewness is 0.667 that fall under the range from -1 to +1 and as the value of skewness is positive it indicates that the data is positively skewed on the right side, which means the right tail of the distribution is longer than the left and the value of Kurtosis is 1.211, which also fall under the range of from -3 to +3 that is acceptable criteria of the variable.

The dependent variable of this research is Investment Decisions which shows the mean value 2.2565 which is positive and fall under the prescribe range of 1 to 5 and the standard deviation value is 0.7123 which is good as per range of standard deviation which is from -1 to +1. The value of skewness is 0.884 that is fall under the range from -1 to +1 and as the value of skewness is positive it indicates that the data is positively skewed on the right side, which means the right tail of the distribution is longer than the left and the value of Kurtosis is 0.822 that also fall under the range of from -3 to +3 that is acceptable criteria of the variable.

The mediating variable of this research is Risk Tolerance which shows the mean value 2.1374 which is positive and fall under the prescribe range of 1 to 5 and the standard deviation value is 0.7096 which is good as per range of standard deviation which is from -1 to +1. The value of skewness is 0.572 that is fall under the range from -1 to +1 and as the value of skewness is positive it indicates that the data is positively skewed on the right side, which means the right tail of the distribution is longer than the left and the value of Kurtosis is 2.085 that also fall under the range of from -3 to +3 that is acceptable criteria of the variable.

- Females statistics

Table 13 Females Descriptive Statistic

| Name of variables | N | Mean | Std. Deviation | Skewness | | Kurtosis | |
|----------------------|-----|--------|----------------|------------|------------|------------|------------|
| | | | | Statistics | Std. Error | Statistics | Std. Error |
| Financial Literacy | 111 | 3.1622 | .6914 | .762 | .229 | 2.823 | .320 |
| Investment Decisions | 111 | 2.4685 | .7631 | .649 | .229 | 1.497 | .320 |
| Risk Tolerance | 111 | 2.5766 | .6835 | .756 | .229 | 1.936 | .320 |

The above mention table shows the descriptive statistics of the research variables of the current research. The first independent variable is Financial Literacy which shows the mean value 3.1622 which is positive and fall under the prescribe range of 1 to 5 and the standard deviation value is 0.6914 which is good as per range of standard deviation which is from -1 to +1. The value of skewness is 0.762 that fall under the range from -1 to +1 and as the value of skewness is positive it indicates that the data is positively skewed on the right side, which means the right tail of the distribution is longer than the left and the value of Kurtosis is 2.823, which also fall under the range of from -3 to +3 that is acceptable criteria of the variable.

The dependent variable of this research is Investment Decisions which shows the mean value 2.4685 which is positive and fall under the prescribe range of 1 to 5 and the standard deviation value is 0.7631 which is good as per range of standard deviation which is from -1 to +1. The value of skewness is 0.649 that is fall under the range from -1 to +1 and as the value of skewness is positive it indicates that the data is positively skewed on the right side, which

means the right tail of the distribution is longer than the left and the value of Kurtosis is 1.497 that also fall under the range of from -3 to +3 that is acceptable criteria of the variable.

The mediating variable of this research is Risk Tolerance which shows the mean value 2.5766 which is positive and fall under the prescribe range of 1 to 5 and the standard deviation value is 0.6835 which is good as per range of standard deviation which is from -1 to +1. The value of skewness is 0.756 that is fall under the range from -1 to +1 and as the value of skewness is positive it indicates that the data is positively skewed on the right side, which means the right tail of the distribution is longer than the left and the value of Kurtosis is 1.936 that also fall under the range of from -3 to +3 that is acceptable criteria of the variable.

4.3. Reliability analysis

The reliability of research instrument is estimated through Cronbach alpha and the below mentioned table exhibits the reliability of the variables taken in current research for overall responses i.e. 233 questionnaires.

Table 14 Cronbach Alpha

| | | Males | Females |
|-----------------------------|---------------------|-------------------------|----------------|
| | No. of items | Cronbach's Alpha | |
| Financial Literacy | 10 | 0.799 | 0.858 |
| Investment Decisions | 29 | 0.731 | 0.784 |
| Risk Tolerance | 5 | 0.889 | 0,716 |

The above-mentioned values of Cronbach alpha in table illustrates the internal consistency or reliability of each of the items of questionnaire. The standard to check the reliability for its acceptability is ≥ 0.70 (Cronbach, 1951; Nunnaly, 1978; Christensen et al.,2015). The independent variable is Financial Literacy that includes ten items and indicates the maximum reliability with the value of Cronbach Alpha of males is 0.799 and for females it is 0.858 which is acceptable as value of alpha is greater than 0.70. Risk Tolerance is mediating variable having five items with the reliability value of males is 0.731 and for females is 0.784 which is acceptable as value of alpha is greater than 0.70. The dependent variable of this research is Investment decisions having twenty-nine items with the reliability of males is

about 0.889 and for females is 0.716 which is acceptable as value of alpha is greater than 0.70. These result shows the overall good reliability of the data.

4.4. Correlation analysis

To find the linear relationship between variables we use correlation analysis and it is denoted by “r”. The results of correlation analysis of variables are shown in the table below.

Table 15 Correlation table of males

| | Financial Literacy | Investment Decisions | Risk Tolerance |
|-----------------------------|---------------------------|-----------------------------|-----------------------|
| Financial Literacy | 1 | 0.905 | 0.542 |
| Investment Decisions | 0.905 | 1 | 0.761 |
| Risk Tolerance | 0.542 | 0.761 | 1 |

The above-mentioned table describes the results of correlation coefficients for the variables of the present study of males i.e. between independent variable, dependent variable and mediator variable. The tables shows that there is a significant positive relationship between the FL & ID and the value of r is 0.905. The relationship between FL & RT is significant positive and the value of r is 0.542. The relationship between ID & RT is significant positive and the value of r is 0.761.

Table 16 Correlation table of females

| | Financial Literacy | Investment Decisions | Risk Tolerance |
|-----------------------------|---------------------------|-----------------------------|-----------------------|
| Financial Literacy | 1 | 0.687 | 0.459 |
| Investment Decisions | 0.687 | 1 | 0.821 |
| Risk Tolerance | 0.459 | 0.821 | 1 |

The above-mentioned table describes the results of correlation coefficients for the variables of the present study for females i.e. between independent variable, dependent variable and mediator variable. The tables shows that there is a significant positive relationship between the FL & ID and the value of r is 0.687. The relationship between FL & RT is significant

positive and the value of r is 0.459. The relationship between ID & RT is significant positive and the value of r is 0.821.

4.5. Multicollinearity

Table 17 Multicollinearity

| | Males | Females |
|-----------------------------|--------------|----------------|
| Financial Literacy | 1.416 | 1.267 |
| Investment Decisions | 1.667 | 1.433 |
| Risk Tolerance | 1.012 | 1.089 |

Johnston R, Jones K, Manley D (2018) suggest that multicollinearity is present if the value of VIF is equal or greater than 2.5 in our case following tables confirms the absence of multicollinearity.

4.6. Validity Analysis

Regarding internal consistency and convergent validity (Table 4.14), Nunnally and Bernstein (1994) suggests that the appropriate level for acceptable reliability of composite reliability value must exceed by 0.7.

Fornell and Larcker (1981) Proposed the criteria for convergent validity that all constructs AVE must exceed by the 0.5 which means every construct explain at least 50% of the variance of the assigned indicators.

Table 18 Construct Reliability and Validity

| | Male | | Female | |
|-----------------------------|------------------------------|---|------------------------------|---|
| | Composite Reliability | Average Variance Extracted (AVE) | Composite Reliability | Average Variance Extracted (AVE) |
| Financial Literacy | 0.783 | 0.595 | 0.867 | 0.737 |
| Investment Decisions | 0.780 | 0.567 | 0.792 | 0.558 |
| Risk Tolerance | 0.809 | 0.646 | 0.952 | 0.818 |

The table 18 shows the square root of the variance shared between the construct and its indicators and the requirement is fulfilled as you see the bold values in diagonal, all the greater than the correlation between each construct.

Table 19 Fornell-Larcker Criterion for Males

| | Financial Literacy | Investment Decisions | Risk Tolerance |
|-----------------------------|---------------------------|-----------------------------|-----------------------|
| Financial Literacy | 0.543 | | |
| Investment Decisions | 0.504 | 0.409 | |
| Risk Tolerance | 0.542 | 0.361 | 0.588 |

Table 20 Fornell-Larcker Criterion for Females

| | Financial Literacy | Investment Decisions | Risk Tolerance |
|-----------------------------|---------------------------|-----------------------------|-----------------------|
| Financial Literacy | 0.687 | | |
| Investment Decisions | 0.515 | 0.821 | |
| Risk Tolerance | 0.459 | 0.561 | 0.564 |

4.7. Regression analysis

The results of correlation analysis indicates that the variables are related to each other or not. It simply shows the direction, significance level and the magnitude of the relationship. Still correlation analysis does not indicate any clue about cause and effect relationship. Hussy and Hussy (1997) argue that two causality not linked can show correlation with each other because they are associated with third variable. Therefore, in order to determine the causal relationship between the variable and to test the hypothesis of the study regression analysis was conducted. The regression analysis calculates whether the independent variable (Financial Literacy) included in the model is the true interpreter of the dependent variable (Investment Decision) and is there any role of the mediating variable (Risk Tolerance) is

exist among the relationship of independent and dependent variable. It also tells how much variation in DV is explained by IV.

The R² values of the variables are above the minimum cut-off value of 0.1 proposed by Falk and Miller (1992). Table 8 shows the R Square of both males and females, in case of males R square is 0.922 which shows 92.2% variation in investment decision is due to FL and for RT it is 0.294 which shows 29.4% variation in RT is due to FL. In case of female, R square of ID is 0.796 which shows 79.6% variation in ID is due to FL and for RT it is 0.211 which shows 21.1% variation in RT is due to FL. The relationship of RT with FL in both cases are (R² = 0.294 for males) and (R² = 0.211 for females) show weak effects, as they do not reach the cut-off of 0.33 indicated by Chin (1998).

Table 21 R square

| | Male | Female |
|----------------------------|-------------|---------------|
| Investment Decision | 0.922 | 0.796 |
| Risk Tolerance | 0.294 | 0.211 |

4.7.1. Hypothesis Testing

H1: There is a positive relation between FL & RT

As shown in table 4.18 the β value of FL & RT in case of male is 0.542 and p value is 0.000 and in case of female β value is 0.459 & p value is 0.000 as β value is positive and statically significant hypothesis 1 can be accepted.

H2: There is positive relation between FL & investment decisions.

As shown in table 4.18 the β value of FL & ID in case of male is 0.697 and p value is 0.000 and in case of female β value is 0.393 & p value is 0.004 as β value is positive and statically significant hypothesis 2 can be accepted.

H3: There is a positive relation between RT & investment decisions.

As shown in table 4.18 the β value of RT & ID in case of male is 0.383 and p value is 0.000 and in case of female β value is 0.640 & p value is 0.000 as β value is positive and statically significant hypothesis 3 can be accepted.

Table 22 β 's and p values

| | Males | | Females | |
|--|---------|---------|---------|---------|
| | β | P value | β | P value |
| Financial Literacy -> Investment Decisions | 0.697 | 0.000 | 0.393 | 0.004 |
| Financial Literacy -> Risk Tolerance | 0.542 | 0.000 | 0.459 | 0.000 |
| Risk Tolerance -> Investment Decisions | 0.383 | 0.000 | 0.640 | 0.000 |

H4: RT mediates the relationship between FL and investment decisions.

- In case of males

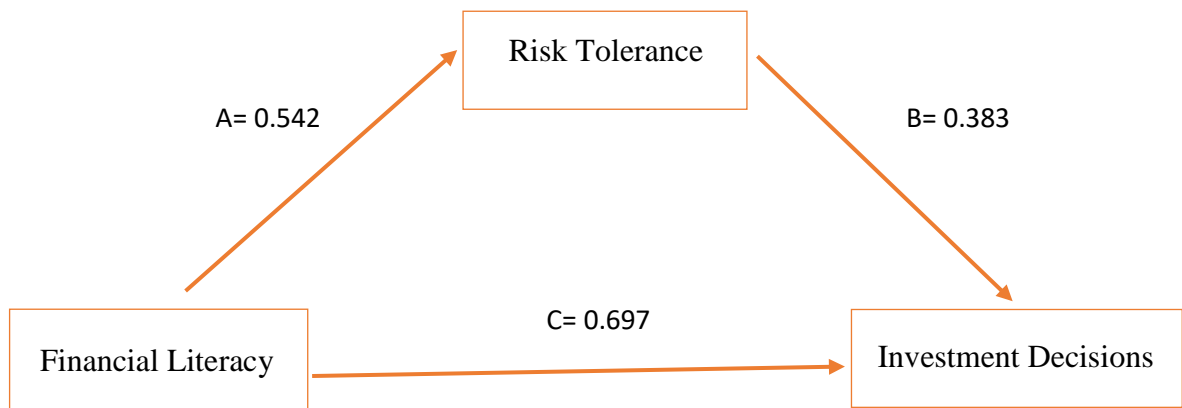


Figure 8 Males Mediating Path

Figure 8 indicate that in relationship at A path between independent variable Financial Literacy and mediating variable Risk Tolerance is positive and significant having coefficient of 0.542. The relationship at path B between mediating variable Risk Tolerance and dependent variable Investment Decisions is positive and significant having coefficient of 0.383. The relationship at path C between Financial Literacy and Investment Decisions is

positive and significant having coefficient of 0.697. As shown in table 10 the special indirect effect for male is 20.8% and after adding our mediator in model the β value of FL & ID is change from 0.697 to 0.905 in case of male which shows that RT mediates the relationship between FL & ID so hypothesis 4 is also accepted.

- **In case of females**

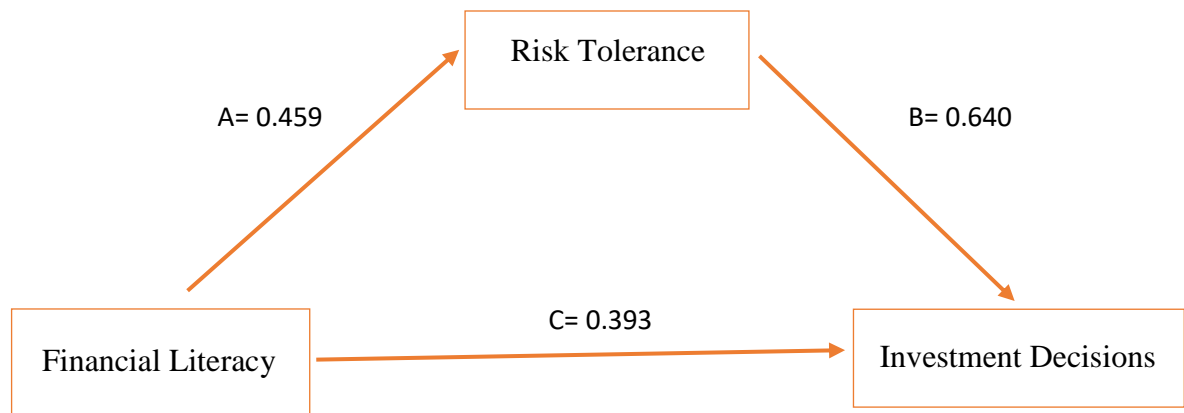


Figure 9 Females Mediating Path

Figure 9 indicate that in relationship at A path between independent variable Financial Literacy and mediating variable Risk Tolerance is positive and significant having coefficient of 0.459. The relationship at path B between mediating variable Risk Tolerance and dependent variable Investment Decisions is positive and significant having coefficient of 0.640. The relationship at path C between Financial Literacy and Investment Decisions is positive and significant having coefficient of 0.393. As shown in table 10 the special indirect effect for female is 29.4% and after adding our mediator in model the β value of FL & ID is change from 0.393 to 0.687 in case of female which shows that RT mediates the relationship between FL & ID so hypothesis 4 is also accepted.

Table 23 Special indirect effect

| | Males | Females |
|---|--------------|----------------|
| Financial Literacy -> Risk Tolerance -> Investment Decisions | 0.208 | 0.294 |

Table 24 Total effect

| | Males | Females |
|--|--------------|----------------|
| Financial Literacy -> Investment Decisions | 0.905 | 0.687 |
| Financial Literacy -> Risk Tolerance | 0.542 | 0.459 |
| Risk Tolerance -> Investment Decisions | 0.383 | 0.640 |

H5: Relationship between FL & RT is stronger in males than in females.

Most previous studies shows that women are more risk averse. When financial literacy is increased men can tolerate even further risk. The findings of this study is also similar as table 9 shows the β value of FL & RT in case of male is 0.542 and in case of female β value is 0.459 which shows men have more capability to tolerate risk so hypothesis 5 is accepted.

Chapter 5

5.1. Conclusion and Discussion

This chapter of thesis covers the result of hypothesis that we get from linear regression and mediation effect of the variable on our model. This chapter further includes conclusion limitations and future direction of the research.

5.1.1. Discussion

This study examined the impact of Financial Literacy and risk tolerance on investment decisions. This study was carried out specifically to ascertain the relationship between these variables. The detailed discussion about their relationship has been discussed below:

5.1.1.1. Financial Literacy & Risk Tolerance

The correlation and regression results of first hypothesis shows that the relationship between financial literacy (FL) and risk tolerance (RT) is significant positive which indicates that when financial literacy increases in general public they are able to tolerate more risk than before because they have confidence that they have enough financial knowledge and this help them in accurate future forecasting, make timely decisions so the H1 is accepted.

5.1.1.2. Financial Literacy and Investment Decisions

The correlation and regression results of second hypothesis shows that the relationship between FL & ID is significant positive, which indicates that when financial literacy increases in general public they can take their investment decisions more confidently because they have enough knowledge and believe that they don't have to face loss if they take decisions on the basis of their financial knowledge so H2 is accepted.

5.1.1.3. Risk Tolerance & Investment Decisions

The correlation and regression results of third hypothesis shows that the relationship between RT and ID is significant positive which indicates that when risk tolerance level is added in the model investors take more investment decisions with the believe to earn more profit as they take more risk so the H3 is also accepted.

5.1.1.4. Mediation of risk tolerance on financial literacy and investment decisions

The correlation and regression results of mediation hypothesis shows that mediation of risk tolerance between financial literacy and investment decisions is significant positive which indicates that when investors have financial knowledge and experience if investment they are able to take more risk therefore H4 is also accepted.

5.1.1.5. Relationship between FL & RT on men and women

The correlation and regression results of hypothesis 5 shows that the men are usually more risk taker by nature and women are risk averse in nature. When financial literacy is increased men are able to take more risk rather than women so the H5 is also accepted.

5.2. Conclusion

The problem of FDM become easy when the variables are well defined by investors. Because of it they are able to take the right decision on right time and the losses can be avoided or reduced in the near future. When making investment decisions, investors are faced with very complex factors such as risk, uncertainty etc. This is a challenge for financial professionals, experienced investors, and especially the general public. Investors should be alert to risks in their financial decisions. Higher investment experience and financial knowledge will lead to greater RT and investors should opt for risky investment securities to match their high level of RT experienced investors with a portfolio of good and bad experience. A wise investor learns from past experience to deal with dangerous situations and to handle things appropriately. With the increasing level of knowledge about financial information and the growing ability to analyze that information, an investor can develop the ability to lean on risky investments in order to achieve higher profits by managing the investment efficiently. Our research seems important as we have also examined the impact. Related financial information and knowledge of factors such as inflation, compound interest and risk, as analyzing these factors also helps to make right decisions. This study proves to be a milestone for future researchers while combining risks and other factors that affect investor decision-making processes. In addition for investors this study is useful while gaining financial information they will know how much information they need to deal with a risky situation and how investing information can help them manage risky investments.

5.3. Limitation and future recommendations

Some limitations to this research are the limited number of respondents, which may not be sufficient to describe or generalize the finding. In future, the adequate number of sample should be collected. Second, as the respondents included from Islamabad and Rawalpindi future research may include other cities. Third, this model includes only three variables to find their impact. Areas of investment experience that have their own positive or negative aspects need to be investigated more closely. In future it is recommended that to analyze the impacts of other different variables. Another limitation of this study is that the current study is cross sectional study basing the analysis on a single period in time. In this case the data was collected in 3 to 4 months. Since in the previous study only the questionnaire was used as a tool, there should be the use of other research tools to make the data more accurate. Due to the economic and political instability in Pakistan the results may differ in terms of other economies. Qualitative studies such as interviewing investors to gain an understanding of how these factors affect and many other factors influencing investment decision making can be explored.

5.4. Scientific contribution of Research

To add body of knowledge in the area of Finance by studying the relationship between financial literacy, risk tolerance and investment decisions.

5.4.1. Industrial Contribution

To provide empirical evidences that will be helpful for people find key indicators to achieve the maximum profit by taking right level of risk with their financial knowledge.

5.4.2. For Society

A contribution to society as Pakistan is struggling because of instable economy, when public have enough financial knowledge they are able to take risk and investment decisions confidently with the believe to earn profit.

6. References

- Bajtelsmit, V. L., & VanDerhei, J. L. (1997). Risk Aversion and Pension Investment Choices. *WHARTON PENSION RESEARCH COUNCIL*.
- Guiso, L., Jappelli, T., & Terlizzese, D. (1996). Income Risk, Borrowing Constraints, and Portfolio Choice. *American Economic Association*.
- HUNG, A. A., PARKER, A. M., & YOONG, J. K. (2009). Defining and Measuring Financial Literacy. *RAND Corporation*.
- Lusardi, A., & Mitchell, O. S. (2007). Financial Literacy and Retirement Preparedness: Evidence and Implications. *WHARTON PENSION RESEARCH COUNCIL*.
- Lusardi, A., & Tufano, P. (2009). Teach Workers about the Perils of Debt.
- Stigler, G. J., & Becker, G. S. (1977). De Gustibus Non Est Disputandum. *American Economic Association*.
- Sung, J., & Hanna, S. (1996). Factors Related To Risk Tolerance. *Financial Counseling and Planning*.
- Yao, R., Gutter, M. S., & Hanna, S. D. (2005). The Financial Risk Tolerance of Blacks, Hispanics and Whites. *Financial Counseling and Planning*.
- Yuh, Y., & Hanna, S. D. (1997). The Demand for Risky Assets in Retirement Portfolios. *Proceedings of the Academy of Financial Services*.
- A.Olsen, R. (2008). Trust as risk and the foundation of investment value.
- Afiqah, N., & Sabri, A. (2016). The Relationship between the Level of Financial Literacy and Investment Decision-Making Millennials in Malaysia.
- Agarwalla, S. K., Barua, S. K., Jacob, J., & Varma, J. R. (2013). Financial Literacy among Working Young in Urban India.
- Agnew, J. R., & Szykman, L. R. (2010). Asset Allocation and Information Overload: The Influence of Information Display, Asset Choice, and Investor Experience. *Journal of Behavioral Finance*.
- Ajzen, I. (1991). The theory of planned behavior.
- Ajzen, I., & Fishbein, M. (1975). A Bayesian analysis of attribution processes.
- Allgood, S., & Walstad, W. B. (2013). THE EFFECTS OF PERCEIVED AND ACTUAL FINANCIAL LITERACY ON FINANCIAL BEHAVIOUR.
- Bajtelsmit, Bernasek, J., & Jianakoplos. (1996). Gender effects in pension investment allocation decisions.
- Bazerman, M. H. (1984). The Relevance of Kahneman and Tversky's Concept of Framing to Organizational Behavior.

- Bernheim, B., Garrett, D. M., & Maki, D. M. (2001). Education and saving:: The long-term effects of high school financial curriculum mandates.
- Butler, K. C., & Domian, D. L. (1991). Risk, Diversification, and the Investment Horizon. *Journal of Portfolio Management*.
- Chaulk, B., Johnson, P. J., & Bulcroft, R. (2003). Effects of Marriage and Children on Financial Risk Tolerance: A Synthesis of Family Development and Prospect Theory.
- Cordell, D. M. (2001). RiskPACK: How to evaluate risk tolerance.
- Dreu, J., & Bikker, J. A. (2012). Investor sophistication and risk taking.
- Gale, w. G., Harris, B. H., & Levine, R. (2012). Raising Household Savings: Does Financial Education Work?
- Galeri, D. (2011). A method for estimating and monitoring the power generated by a photovoltaic module based on supervised adaptive neural networks.
- Gallery, N., Newton, C., & Palm, C. (2011). Framework for Assessing Financial Literacy and Superannuation investment choice decision.
- Grable, J. (2000). Financial risk tolerance and additional factors that affect risk taking in everyday money matters.
- Grable, J. E. (2008). Environmental and Biopsychosocial Profiling as a Means for Describing Financial Risk-Taking Behavior.
- Grable, J. E. (2008). Risk Tolerance.
- Grable, J. E., & Lytton, R. H. (2001). Assessing The Concurrent Validity Of The SCF Risk Tolerance Question.
- Grable, J. E., & Joo, S.-h. (1999). How To Improve Financial Knowledge, Attitudes, And Behaviors Among Consumer Science Constituencies.
- Grable, J. E., & Joo, S.-H. (2004). Environmental and biopsychosocial factors associated with financial risk tolerance.
- Grable, J. E., & Lytton, R. H. (1998). Determinants of defined contribution plan employee participants. *Consumer Interest*.
- Grable, J., Lytton, R. H., Neill, B. O., Joo, S.-H., & Klock, D. (2006). Risk Tolerance, Projection Bias, Vividness, and Equity Prices.
- Gustafsson, C., & Omark, L. (2015). Financial literacy's effect on financial risk tolerance.
- Honohan, P. (2008). Cross-country variation in household access to financial services.
- Jureviciene, D., & Jermakova, K. (2012). The Impact of Individuals' Financial Behaviour on Investment Decisions.

- Kennickell, A. B., McCluer, M. S., & Sunden, A. E. (1997). Family Finances in the U.S.: Recent Evidence from the Survey of Consumer Finances. *Federal Reserve Bulletin*.
- Klapper, L. F., Lusardi, A., & Panos, G. A. (2012). FINANCIAL LITERACY AND THE FINANCIAL CRISIS.
- Kogan, N., & Wallach, M. A. (1964). Risk taking: A study in cognition and personality.
- Lusardi, A., & Mitchell, O. S. (2009). Financial Literacy: evidence and implication on financial education.
- Mandell, & Klein. (2007). Motivation and financial literacy.
- Pak, & Mahmood. (2012).
- ROBERTS, J. A., & JONES, E. (2001). Money Attitudes, Credit Card Use & Compulsive Buying among American College Students. *THE JOURNAL. OF CONSUMER AFFAIRS*.
- Roszkowski. (1998).
- Roszkowski, M. J., & Snelbecker, G. E. (1990). Effects of "Framing" on measures of risk tolerance: Financial planners are not immune.
- Roszkowski, M., & Grable, J. E. (2008). The influence of mood on the willingness to take financial risks.
- Tang, N., & Baker, A. (2016). Self-esteem, financial knowledge and financial behaviour.
- Trone. (1996).
- Wang, C., & Hanna, S. D. (2007). The Risk Tolerance and Stock Ownership of Business Owning Households. *Association for Financial Counseling and Planning Education*.

7. Questionnaire

Dear Respondent!

I am MBA 1.5 student of Bahria University, Islamabad and conducting a research survey on my thesis entitled “**The impact of financial literacy and risk tolerance: an analysis of gender differences**”. These questions require answers based on your experiences. Your answers and identity will be kept strictly confidential and will be used only for research purpose so kindly give an honest opinion to make this research unbiased.

You are requested to take 15 minutes out of your busy schedule to fill this questionnaire.

Once again thanks for your precious time and cooperation.

Regards,

Eman Fatima

Bahria University, Islamabad

Email: emanfatima964@gmail.com

Section – 1: Demographics

1. Please complete the following Information, which will help us to analyze the data in a meaningful manner:

Section: 1

1. **Gender** Male Female
-
2. **Age** under 18 years 18-25 years 26-33 years
 34 & above
-
3. **Education** under Matric Matric Intermediate Graduate
 Master M. Phil Ph.D.
-
4. **Experience** 1-5 Years 6-10 Years 11 & Above
-
5. **Income** 25000-below 25001-49000 49001-74000
 74001-99000 99001-above
-
6. **Family** Single Married Married with children Divorcee/widow
-

Section- 2:

Please indicate the extent of your agreement and disagreement by entering the appropriate option.

Strongly disagree-1, Disagree-2, Neutral-3, Agreed-4, strongly agreed-5

| Questioner Items | Scale | | | | |
|---------------------------|--------------------------|-----------------|----------------|--------------|-----------------------|
| Financial literacy | Strongly disagree | Disagree | Neutral | Agree | Strongly Agree |

| | | | | | |
|---|--|--|--|--|--|
| I am careful in spending money. | | | | | |
| I normally save money each month. | | | | | |
| I always use monthly budget. | | | | | |
| I usually give advice about finances to my friends. | | | | | |
| I believe that financial literacy help leads a financially secure life. | | | | | |
| I know how the stock market works. | | | | | |
| I think buying insurance policy is a better investment option. | | | | | |
| I have never thought about saving for retirement. | | | | | |
| I believe investing money in different assets decreases the risk. | | | | | |
| In my opinion purchasing, gold is better than other investments. | | | | | |
| Risk tolerance | | | | | |

| | | | | | |
|---|--|--|--|--|--|
| Investing is too difficult to understand. | | | | | |
| I am more comfortable putting my money in a bank account than in the stock market. | | | | | |
| When I think of the word “risk” the term “loss” comes to mind immediately. | | | | | |
| Making money in stocks and bonds is based on luck. | | | | | |
| In terms of investing, safety is more important than returns. | | | | | |
| Investment Decisions | | | | | |
| 6-Step financial planning | | | | | |
| Understanding of financial planning. | | | | | |
| Set financial goals and objectives in life. | | | | | |
| Gather data and analyze current financial situation before make a financial decision. | | | | | |

| | | | | | |
|---|--|--|--|--|--|
| Execute plan with the help of experts i.e. financial planner, insurance advisor, etc. | | | | | |
| Review financial plan periodically after implementation. | | | | | |
| Managing tax | | | | | |
| Utilize tax relieves and rebate in filling tax return | | | | | |
| Do not mind paying tax as amount payable is very minimal | | | | | |
| Manage own taxes | | | | | |
| Managing liabilities | | | | | |
| Pay off full credit card outstanding amount every month | | | | | |
| Opine that interest charges by financial institution on credit card balance is reasonable | | | | | |
| On time settlement of mortgage and hire purchase installments | | | | | |
| Opine that various personal loans available in the market is a | | | | | |

| | | | | | |
|--|--|--|--|--|--|
| convenient financial tool | | | | | |
| Managing insurance | | | | | |
| Have sufficient insurance coverage in the event of death, disability or sickness | | | | | |
| Have only life insurance, no other type of insurance | | | | | |
| Able to distinguish different types of insurance in the market | | | | | |
| Do not have any insurance | | | | | |
| Managing investment | | | | | |
| Invest based on opinions of friends and family | | | | | |
| Understand own risk profile | | | | | |
| Have investments in different investment instruments | | | | | |
| Appreciate the interest compounding effect | | | | | |

| | | | | | |
|--|--|--|--|--|--|
| If given a lump sum money, know how to use it properly | | | | | |
| Managing retirement | | | | | |
| Know the amount of money needed for retirement | | | | | |
| Have started retirement planning | | | | | |
| Have a formal retirement plan | | | | | |
| Opine that the money in EPF is sufficient to use during retirement | | | | | |
| Estate planning | | | | | |
| Have a will | | | | | |
| Understand what a trust is | | | | | |
| Opine that estate planning is important | | | | | |
| Estate planning leave peace of mind | | | | | |

