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Publisher	Effat University
Download date	2026-05-21 11:35:29
Link to Item	http://hdl.handle.net/20.500.14131/260

Gender effect on financial risk tolerance

The case of Saudi Arabia

By

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Thesis submitted in partial fulfillment for the degree of Master of Science in Islamic
Financial Management

In accordance with the requirements of Effat University

College of Business

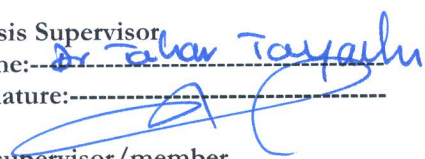
Effat University - Jeddah

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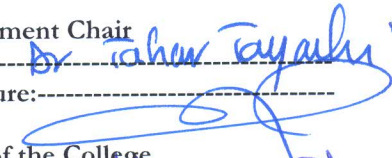
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Abstract

The concept of risk tolerance represents an important element when shaping and developing financial strategies that meets investors' financial goals. This study aims to examine the relationship between gender and financial risk taking behavior among professionals in Saudi Arabia. Additionally, the study examines if demographic variables namely, age, income, education and marital status interact with gender to determine differences in risk preferences, by investigating the relationship between the 13-item Grable & Lytton psychometrically derived measure of subjective financial risk tolerance and the demographic factors. An independent sample t-test, chi-square test and two-way ANOVA was used to examine the data obtained from 244 professionals in banking and financial sector in Saudi Arabia. The result of this study determined that the influence of gender on financial risk attitudes appears to be insignificant between professionals in Saudi. The results also determined that the demographic factors, age, income, education and marital status does not significantly affect financial risk tolerance among genders. This study indicates that understanding risk tolerance is a complex process that goes beyond the exclusive use of demographic factors. The main implications of this study is regarding the financial advisory industry, where relying primarily on the demographic factors to classify the investors into risk tolerance groups may not be suitable. However, the results of the study are limited due to the sample selection that included only professionals in the financial domain, which restricts the ability of generalizing the results.

Key words: financial risk tolerance, gender, demographic characteristics.

ACKNOWLEDGMENTS

First and foremost, all glory goes to God, then to my parents. Mom, thank you for giving me the love of learning, you always believed in me, and pushed me to believe in myself. This dissertation would not have been possible without the love and support of my lovely sisters Samia, fetuon and dhay. To those special people in my life I say “thank you”. A special thanks goes out to my dear sister Selwan, manager of Alinma bank for her boundless support. I am also appreciative of the guidance provided by my supervisors, instructors and professors, Tahar Tayachi, Uzma Javed and Shabir Hakim who have made my academic journey possible. I will always be grateful to my colleagues and friends in Effat University, for providing me with opportunities to be myself and learn.

TABLE OF CONTENTS

1	Introduction	1
1.1	Research purpose and objectives	2
1.2	Research questions	2
1.3	Significance of the study	3
1.4	Organization of the thesis	4
2	Literature review	5
2.1	Introduction.....	5
2.2	Literature on gender difference in risk tolerance:	6
2.3	Literature on the demographics and financial risk tolerance:.....	11
2.3.1	Financial knowledge and education.....	13
2.3.2	Age	15
2.3.3	Marital status	16
2.3.4	Income	17
2.4	Factors - reasons that influence differences in risk taking among genders	20
2.4.1	The Social factors	20
2.4.2	The psychological factors	21
2.4.3	The biological factors	23
2.5	Gender differences in Saudi Arabia	24
2.6	Summary	30
3	Methodology	32
3.1	Introduction.....	32
3.2	Research Design.....	33
3.3	Data and Sample	34
3.4	The tools.....	37
3.5	Summary	40
4	Results and discussion	41
4.1	Introduction.....	41
4.2	Descriptive statics	43
4.3	Hypotheses testing	45
4.4	summary.....	54
5	Implications, recommendation and conclusion	55
5.1	introduction	55

5.2	Implications.....	55
5.3	Limitation.....	57
5.4	Future work.....	58
5.5	Conclusion	59
6	References	61

List of Tables

Table 1: List of Banks, Financial companies and Insurance companies in the sample	35
Table 2 Sample selection and analysis	36
Table 3: Levels of risk tolerance in the sample.	42
Table 4: Descriptive statistics, normality and reliability	43
Table 5: Demographic Profile of the respondents	45
Table 6: ANOVA for between subjects effects - gender and Age	48
Table 7: ANOVA for between subjects effects - gender and education	49
Table 8: ANOVA for between subjects effects - gender and marital status	50
Table 9: ANOVA for between subjects effects - gender and income.....	51

List of figures

Figure 1 education level of the sample	
Figure 2 income of the sample	
Figure 3 marital status of the sample	

1 INTRODUCTION

Decades ago, concerns and questions regarding gender differences in investment behavior were raised, their investment patterns, financial portfolios formation and maintenance, and their financial risk tolerance. These issues were partially addressed and documented in the previous studies; nevertheless, to date few aspects remain unclear, especially in settings like Saudi Arabia where the financial markets remain largely dominated by male investors.

Risk and return are the major aspects in valuating an investment opportunity. Accordingly, when financial risk is viewed as the “probability that an investment will fail to generate the return that it was expected to generate” understanding differences in risk tolerance in relation to gender and other demographics as age, education and income can be of a great importance to understand differences in valuating investments. In addition, gender is considered one of the top three determinant of investing along with age and income (Bajtelmsmit, *et al.*, 1996). Similarly, it was stated by Lewellen *et al.*, (1977) that gender is the third most significant determinant of investing style.

Knowledge of individuals’ characteristics and the risk preferences trends among the society is vital for developing the financial market as well as policy-making and educational purposes. Moreover, the nature of each market needs to be informed by the characteristics of its participants in order to be the best reflection of their needs, rather than being a reflection of the design and procedure of a different market. While benefiting of other markets development experience and utilizing their knowledge and products to best suit the current needs and characteristics of the investors. Thus, examining the differences

in financial risk tolerance among individuals and the factors that influence these differences is the aim of this study.

1.1 RESEARCH PURPOSE AND OBJECTIVES

There is proof in the literature that women are -on average- more risk averse than men. There is also proof that gender-based differences are not applicable on the sub-population of professionals in the field of finance and investment. The main objectives of the study is to provide a better understanding of risk attitude as a fundamental power that derive the decision-making in the professional population in Saudi Arabia by examining the following:

- 1- Investigate the relationship between gender and financial risk taking behavior among professionals in Saudi Arabia.
- 2- Investigate the relationship between risk tolerance among genders and other demographic characteristics namely, age, income, education and marital status in Saudi Arabia.

1.2 RESEARCH QUESTIONS

The research questions and hypotheses are formulated in the light of the literature. The literature assumes that women are on average more risk averse than men (Casanovas, & Merigó, 2012; Charness, & Gneezy, 2012; Eckel & Grossman, 2002; Jianakoplos, & Bernasek, 1998; Neelakantan, 2010 among others). And that the sociographic and demographic factors as age, income, marital status, education and level of financial knowledge along with gender are formulating different risk preferences among the

investors (Adhikari & O'Leary, 2011; Chavali & Mohanraj, 2016; Kumar, *et al.*, 2015; Sweet, 2013; Wong, 2011). Thus, this study aims to answer the following questions.

Q1. What relationship exists between risk tolerance and gender in Saudi Arabia?

Q2. How does other demographic variables interact with gender in determining risk preferences in Saudi Arabia?

1.3 SIGNIFICANCE OF THE STUDY

The main distinction of the study is that in the scenario of Saudi Arabia, there is not any study that we know of, that assesses the gender-based differences or demographics effect on financial risk tolerance. Moreover, this study is controlling for the level of financial knowledge by sampling professionals in the field of finance, as it is suggested to moderate the differences among genders in risk tolerance (Hibbert *et al.*, 2013; Martenson, 2008). Additionally, this study is assessing the effect of a number of demographic factors as age, income, marital status on risk preferences (Bajtelsmit & VanDerhei, 1997), and determining which of these factors are the most significant in the case of professional in Saudi. Furthermore, the previous literature studied the impact of the demographic factors on risk taking behavior (Riley *et al.*, 1992; Grable & lytton, 1999a; Adhikari & O'Leary, 2011; Wong, 2011; Kumar, *et al.*, 2015; Chavali & Mohanraj, 2016). However, only few studies are assessing the impact of interactions between these factors on risk tolerance (Sweet, 2013). This study aims to fill this void by mainly assessing the interaction between gender -as the most discussed factor in the literature- and the other demographic factors namely, age, income, education and marital status. The literature showed opposing and conflicting results concerning gender-based differences in risk attitudes and the impact of

demographics on risk tolerance level, thus this study will contribute to the debate in this area from a developing country perspective namely, Saudi Arabia.

1.4 ORGANIZATION OF THE THESIS

The remaining of the study is structured in four chapters as follows: the second chapter consists of three sections reviewing the relevant literature on the gender-based differences in financial risk tolerance, the literature on the demographics effect on risk tolerance and the literature on the general and Saudi-special factors that influence gender differences in risk tolerance. The methodology and the research design follows in the third chapter. Followed by the findings and discussion of the results in the fourth chapter. The final chapter includes implications, limitations of the results along with future work and the conclusion.

2 LITERATURE REVIEW

2.1 INTRODUCTION

Risk attitudes in financial matters is generally termed financial risk tolerance (FRT) or risk aversion (RA), the two terms are antithetical where the decrease in financial risk tolerance is increase in risk aversion (Sweet, 2013). The topic of gender-based differences in risk tolerance has been given adequate attention by researchers especially in America and Europe. The literature tackling this topic is rich, diverse and conflicting in some cases. However, the academic literature on this topic in the setting of Saudi Arabia is lacking.

This study aims to provide a practical evidence of the presence or absence of gender differences in financial risk taking in a setting like Saudi Arabia, which has future implications in the business and finance domain.

The literature review chapter is divided into three sections; the first section provides a review of the previous literature on the main views on gender-based differences. In the second section, the effect of demographic and sociographic factors on the degree of risk taking among individuals is discussed. Where both researchers and practitioners suggested that demographic factors could be used to classify individuals into risk taking groups (Adhikari & O'Leary, 2011; Chavali & Mohanraj, 2016; Kumar, *et al.*, 2015; Sweet, 2013; Wong, 2011). The third section provides a review of the reasons that influence the differences in financial risk attitudes among genders. Where in the fourth section a discussion of reasons of possible gender differences that are special to the context of Saudi Arabia are to be deliberated.

2.2 LITERATURE ON GENDER DIFFERENCE IN RISK TOLERANCE:

The body of literature on gender difference in risk tolerance mainly consists of four views. The first view states that women are on average more risk averse than men (Casanovas, & Merigó, 2012; Charness, & Gneezy, 2012; Eckel & Grossman, 2002; Jianakoplos, & Bernasek, 1998; Neelakantan, 2010 among others). Byrnes, Miller, & Schafer (1999) in their meta-analysis of over 150 studies in gender differences in risk taking of both self-perceived and actual behavior, came to a general conclusion that women are on average more risk averse than men.

The second view in the literature found that gender-based differences are not applicable on the sub-population of professionals in the field of finance and investments (Adhikari & O'Leary, 2011; Hallahan, *et al.*, 2003; Hardies, *et al.*, 2013; Kumar *et al.*, 2015; Martenson, 2008; Montford & Goldsmith, 2016; Wong, 2011).

The third view in the literature concluded that there is no significant gender difference in financial matters (Casanovas & Merigó, 2012; Deaves *et al.*, 2007; Schubert *et al.*, 1999; Qiao, 2012). Casanovas & Merigó (2012) in their study on business school students, they examined the gender differences on saving decision-making and found that on their sample there was no significant difference between males and females.

A fourth part of the literature showed opposing view, in that professional females are more risk tolerant than their male counterparts. Bliss & Potter (2002) in their study on fund managers tested two hypotheses. Firstly, female fund managers are more risk averse, and secondly, that risk aversion behavior will yield higher returns of the portfolio. They found contradicting results to the first view, in that female fund managers held riskier portfolios

that yielded higher raw returns than their male counterparts did on a sample of 5853 American and 1702 international funds. However, in a more recent study of more than 640 fund managers from US, Germany, Italy and Thailand, their results were in line with the first view of literature in that female fund managers tend to be more risk averse than their male counterparts (Beckmann & Menkhoff, 2008). These contradicting results can be attributed to the nature of behavioral studies and the contextual frame of the study. However, considerable part of the literature on gender differences in risk tolerance indicates that women are more risk averse than men. Sweet (2013) stated that there is general consensus in the literature that women are on average less risk tolerant than men.

Another reason of the contradicting results is differences in risk perception and evaluation among genders that must be taken into consideration in order to be able to adequately explore the gender differences in risk taking behaviors. Risk perception is “the subjective interpretation of expected loss.” (Brindley, 2005, p. 145). It is a subjective interpretation in that it depends on the decision maker’s own view, understanding and feeling towards the event in question, which differs from one person to another. According to Sitkin & Weingart (1995) it is crucial to include risk perception and risk propensity as “key mediators” in the models of risk behaviors as they significantly influence the risk-taking behaviors. They define risk propensity as the cumulative tendency to take risks, which is can be easily formulated early in an individual’s career life. Furthermore, D. Ivanova & M. Ivanova (2011) used the risk perception, risk propensity and gender as mediators to assess the risk taking behavior on the professional population of entrepreneurs. They came along consistent results that female entrepreneurs tend to have

lower risk propensity than male entrepreneurs that accordingly they were unlikely to show high-risk taking behavior.

Gender differences and risk taking behavior in financial matters have been discussed in the literature from various dimensions such as portfolio construction (Casanovas & Merigó, 2012), asset allocation, investment strategy (Graham, *et al.*, 2002), common stock investments (Sebai, 2014), mutual funds management (Martenson, 2008), mutual fund investors (Dwyer, *et al.*, 2002), saving behavior (Qiao, 2012), decision-making process (L. Bogan *et al.*, 2013). In addition, it was frequently examined on the population of unprofessional investors such as business school students who lack experience and market knowledge but are familiar with the financial concepts and are potential investors in the market (Ahmed N., 2012), and the sub-population of professionals as CEOs (Palvia *et al.*, 2015), business professors (Casanovas & Merigó, 2012; Hibbert *et al.*, 2013), and businessmen and women (D. Ivanova & M. Ivanova, 2011).

Faccio, *et al.*, (2012) evidenced consistent results from the perspective of CEOs gender and its role in explaining differences in cooperate decision making, where female CEOs tend to show lower risk tendencies in the means of lower leverage and less volatile returns which made these firms more resilient than firms run by male CEOs.

Bajtelsmit & VanDerhei (1997) in their study aimed to explore the effect of demographic characteristics on the pension allocation by examining the effect of age, gender, salary, and wealth. In sample of 20,000 employees, they hypothesized that the characteristics will affect the probability of choosing one of the five asset classes imbedded in the study that is employer stock, diversified equity portfolio, government bond portfolio, social choice equity fund, and guaranteed-interest fund. Their empirical result showed that

women tend to invest in the guaranteed-interest fund while more men invested in the employer stock. In addition, they found no significant gender difference in investing in a diversified equity portfolio. Thus, they came to the conclusion that the women in that sample tend to be more risk averse than men but they cannot generalize these results due to lack of evidence on gender differences on the moderate risk asset class (diversified equity portfolio).

In a consistent result from the common stocks investments on a sample of more than 35,000 households over six years, Barber & Odean (2001) found that married men traded by 45% more than married women and they finished with 1% less than women in net return. while single men traded by 60% more than single women and finished with 1.4% less net return however they didn't find that women chose less risky stocks in the market. It can be concluded from this data that excessive trading indicates higher risk taking associated with higher costs and expenses that eats the expected returns. Likewise, from Portfolio construction point of view, women tend to stress on reducing of portfolio risk more than men do (Olsen & Cox, 2001).

Furthermore, in an attempt to tackle this subject in an emerging economy, Hira (2006) used the types of assets preferred by Turkish, male and female investors as proxies for the level of risk where stocks represent the highest level and time deposits are the least risky choice. His finding goes in line with the first view of the literature, suggesting that women are more risk averse. Jianakoplos & Bernasek (1998) state that women on average have less risky assets holdings than men, which indicate a higher level of risk-averseness.

Graham, *et al.*, (2002) illustrated another gender-based difference in investment strategy that women seem to be risk averse in their investment strategy. They stated that

the reason behind these differences is the primary differences in information processing among genders where women are more details-oriented and tend to view their decisions more comprehensively than men do, which may lead to opportunity loss in the cases of low risk decisions and better results when it comes to risky decisions. Additionally, L. Bogan, R. Just & S. Dev (2013) evaluated the management team performance by gender rather than the individual risk taking behavior, and they found that male teams are more risk seekers than female teams; they also found that a male presence in the team would increase the level of risk taking. These results has large potential applications in constructing the managerial and financial teams and managerial boards, depending on the stage and position of the company and the level of risk they are willing to bear.

There is lack of studies that address the size of gender differences in risk taking over time, however, Byrnes, *et al.* (1999) in their meta-analysis of over 150 gender and risk studies, concluded that the gender gap is decreasing over time. But then more research need to be conducted to cover this area that it will give indicators to the factors that most influence the gender differences in risk taking behavior.

In conclusion, the most recent papers shows consistent results with the majority of the literature that women are -on average- more risk averse than men (Deo & Sundar, 2015). Being risk averse will dispose women to challenging financial conditions, given the longer life expectancy of women and lower income compared to men (global gender gap index, 2016). However, in the professional population this distinction does not seem to be strongly present (Hallahan, *et al.*, 2003; Hardies, *et al.*, 2013). This indicates the enduring influence of gender on the financial decision-making as it may reflect the major changes in the financial markets by means of higher percentage of female participants in the markets and

females' level of education around the world. Based on the literature review we form the research first null and alternative hypotheses.

H1₀ = There is not significant difference in the risk preference between males and females.

H1_a = There is significant difference in the risk preference between males and females.

2.3 LITERATURE ON THE DEMOGRAPHICS AND FINANCIAL RISK

TOLERANCE:

Considerable part of the literature is discussing the effect of demographic and sociographic factors on the degree of risk taking among individuals. Where both researchers and practitioners suggested that demographic factors could be used to classify individuals into risk taking groups (Sweet, 2013). These factors include gender, age, income, marital status, number of children or dependents, education, financial knowledge and experience (Adhikari & O'Leary, 2011), nationality (Wong, 2011; Root *et al.*, 2014), occupation and area of specialization (Root *et al.*, 2014) and race (Flynn *et al.*, 1994). This part of the literature discusses the possibility of providing evidence that demographic factors are moderating the level of financial risk taking (Adhikari & O'Leary, 2011; Chavali & Mohanraj, 2016; Kumar, *et al.*, 2015; Sweet, 2013; Wong, 2011). Some papers addressed the effect of these factors combined (Adhikari & O'Leary, 2011; Root *et al.*, 2014; Kumar *et al.*, 2015) or independently (Summers *et al.*, 2006; Charles & Kasilingam, 2013) it was also tested across different countries in comparative studies (Wong, 2011). In 1998, Grable & Lytton, listed eight demographic factors as the most used and significant factors in affecting risk tolerance level, (gender, age, marital status, occupation, self-employment, income, race, and education). However, from that point in time research is still ongoing to

find the most significant and affecting factors that influence the level of financial risk taking among individuals (Sweet, 2013). It was found that the effect of these factors is changing over time and have a varying impact in different countries (Wong, 2011). Nevertheless, four of these factors are the most predominantly studied factors in the literature as risk moderators when assessing the level of financial risk tolerance among genders, namely, age, income, knowledge and marital status (Adhikari & O'Leary, 2011; Sweet, 2013). Therefore, this study will be examining the effect of age, marital status, education and income -as the main moderators- on the level of risk tolerance among males and females in Saudi Arabia, and to what extent does it affect the risk taking behavior in our developing economy. In addition, this study will be controlling for the financial knowledge factor by using a sample of professionals in the investment and banking sector in Saudi Arabia.

One of the earliest work on demographics relation to risk behavior was conducted by Bajtelsmit & VanDerhei in 1997. In their study, they aimed to explore the effect of demographic characteristics on the pension allocation by examining the effect of age, gender, salary, and wealth in a sample of 20,000 employees and they found that gender was significantly related to financial risk tolerance in terms of pension investment allocation. In another study a positive relationship between risk tolerance and income was found, while females and older individuals had a negative relationship with risk tolerance in line with the previous literature though, a significant relationship between risk tolerance and education, wealth or marital status was not found. Gibson *et al.* (2013) studied the effect of demographic factors on 2,000 individuals in 2009 right after the 2008 financial crisis. They aimed to examine the effect of the commonly used factors in the literature,

gender, age, income, education, marital status and financial knowledge along with examining a number of unexplored factors as the use of financial advisors, risk perception and stock market participation after the global crisis. They found an interesting negative result between the risk tolerance level and getting help from a financial advisor, which may represent the unusual nature of the period following the financial crisis. Sweet (2013) aimed to explore the effect of the demographic characteristics on financial risk tolerance and she found that the variables “female” and the income category was the best in predicting the risk tolerance level of an individual among a number of demographics as age, education and years to retirement. Following a discussion of each of the demographic factors used in this study.

2.3.1 FINANCIAL KNOWLEDGE AND EDUCATION

Number of studies had discussed the influence of financial knowledge on the risk taking level (Adhikari & O'Leary, 2011; Kumar *et al.*, 2015 Martenson, 2008; Wong, 2011). Hibbert *et al.* (2013) examined the topic by surveying finance professors and compared their actual portfolios to that of subjects with different levels of education but with no deep financial knowledge. They found that when controlling for level of financial education and the important demographic as age and income there is no significant difference between men and women in allocating risky assets in their portfolios. Sebai (2014, p. 318) stated, “When having financial expertise, women become more risk seeking”, which supports the positive significant relationship between self-perceived level of knowledge and risk tolerance found by Adhikari & O'Leary in 2011 who found this relationship stronger than the relation between gender and financial risk tolerance on his sample of Nepalese banking sector employees. He also concluded that knowledge of the

financial markets and products explained the risk aversion attitude more than the gender of the participant, and that these differences in his sample were muted when financial knowledge was used as an explanatory variable. The financial knowledge in the literature is suggested to subdue the gender gap in risk preferences (Hibbert *et al.*, 2013; Martenson, 2008).

The literature also suggests that general formal educated individuals tend to be more risk tolerant than their non-educated counterparts (Al-Ajmi, 2008; Riley *et al.*, 1992). Further, Grable & Lytton (1999a) stated that the level of education a person has is the most distinctive factor in classifying individuals into risk tolerance groups, where the education variable was considered the optimum variable. In a recent consensus, Kumar *et al.*, (2015) found that education and wealth are the most significant predictors of risk taking behavior and they explained more of the dependent variable as risk tolerance than gender did on their sample. Wong (2011) who found a similar relationship, suggested that this increase in risk tolerance associated with education is a reflection of understanding risk nature, assessment and management, thus risk attitude may be affected by the kind of education received. This positive relationship between education and risk taking may also reflect the opportunities the education gives to an individual in terms of recovering potential losses irrespective to the type of education attained. From the setting of Saudi Arabia, Ahmed N. (2012) found that female investors are more willing to own stocks if they had more education. She also found that in her sample, the willingness to own stocks was related to education more than the self-perceived risk level. In contrast, there are studies that did not find support of the relationship between education and risk acceptance (Deaves *et al.*, 2007; Hallahan *et al.*, 2003).

2.3.2 AGE

On the relation between age and risk, there is lack on the literature that assesses the level of financial risk tolerance and age separately, and when a multidimensional topic as risk is discussed it is not surprising to find conflicting results. While some studies could not find significant effect of age on risk tolerance (Anbar & Eker, 2010; Sulaiman, E. K., 2012). There are more evidences in the literature that the level of risk preferred by an individual is not constant across their life span, where age had a main univariate significant effect on financial risk tolerance (Chattopadhyay & Dasgupta, 2015; Charles & Kasilingam, 2013; Hallahan *et al.*, 2003; Lemaster, 2014; Riley *et al.*, 1992). The majority of research evidenced a negative relationship between risk tolerance and age, where risk tolerance decreased with age. The results of Lemaster (2014) study found that young adults showed relatively higher financial risk tolerance than older adults in the case of men sample, while the level of financial risk tolerance of women sample remained constant with age; however, women reported more risk aversion than men did across their life span. These differences may reflect biological changes -as decreasing in testosterone therefore masculine characteristics- in taking higher risk. Another explanation for the possible decline in risk tolerance level is the future limited time perspective (Carstensen, L., 2006). As people age they tend to feel that the time they have left is less, which influence their perspective and their decisions in risk. Lemaster (2014) tested this hypothesis and he found that risk aversion depends on the person's view of the future. The less the future time expected by an individual, the more risk averse they become, however, when people view their future as expansive and full of opportunities rather than barriers and limitations they

tend to have greater risk tolerance across their life span. Conversely, other part in the literature finds that people become more risk seeking with age (Summers *et al.*, 2006). One of the most significant and earliest work on demographics relation to financial risk tolerance is represented by Riley *et al.*, (1992) where they studied the actual asset allocation behavior in U.S random population. They found a non-linear relationship between age and risk where risk tolerance increases with age but to a point, then it starts to decrease after the age of retirement. This can also reflect the changes in the environmental and cultural inputs as well as changes in level of education and expertise along with the built confidence in decision-making (Hallahan *et al.*, 2003). Furthermore, it can be a reflection of income more than a reflection of age where older people may have cumulated wealth that allows them to take riskier decisions.

2.3.3 MARITAL STATUS

More on the demographics and its effect on the degree of risk tolerance, the relation between marital status and the degree of risk tolerance was tested in the literature. Riley *et al.*, (1992) found an empirical difference from asset allocation perspective between married and never married individuals in terms of risk aversion. Married individuals showed higher risk aversion, where widowed and separated individuals were the most risk averse. Reporting similar results, Grable & Lytton (1998) described that married people are disposed to higher influence of *social risk* that was defined as the possible esteem loss in the eyes of the society when taking underestimated risky decisions. Yao & Hanna (2005) studied the differences between single and married males and females to assess the effect of marital status on financial risk tolerance. They found that on average single men are ready to bear more financial risk than their married counterparts, followed by unmarried

women then married women. Wong (2011) in his comparative study of three countries, United States, United Kingdom and Australia, found that risk tolerance slightly declines with marriage. This can be explained by the increase in responsibility where the potential losses will not affect the investor individually, and the number of dependent that requires higher expenses which leaves less funds for investment purposes. Conversely, some studies found opposing results in that married people are more risk tolerant than their single counterparts due to communal income and combined human capital in marriage (Hallahan *et al.*, 2003). On the other hand, some studies could not find a significant relation between marital status and risk tolerance (Hallahan *et al.*, 2003; Deaves *et al.*, 2007). Anbar & Eker (2010) in their study of 1,100 university students also found that marital status does not significantly predict risk tolerance attitude.

2.3.4 INCOME

The last moderator of risk tolerance proposed in this study is income. The literature has differentiated between income as represented by monthly accumulation over a year and wealth as accumulation of income from year to year and it may include properties (Sweet, 2013). It is found in the literature that income has a positive relationship with risk tolerance, in that individuals with higher income are significantly more risk tolerant than lower income individuals (Hallahan *et al.*, 2003; Kumar *et al.*, 2015; Riley *et al.*, 1992; Wong, 2011). One of the most significant and earliest work on demographics relation to financial risk tolerance is represented by Riley *et al.*, (1992) where they studied the actual asset allocation behavior in U.S random population, and they found a positive relationship between income and risk taking level. They stated that very wealthy individuals and very poor was the second best predictor of risk tolerance level after age in their sample. Hallahan

et al., (2003) reported that risk tolerance showed a concave relationship with income in all age groups and regardless of gender. Deaves *et al.*, (2007) concluded that respondents with higher salaries were found to be more risk tolerant. The rationale behind this relationship is that the more income an individual has, the more chances he has to cover any losses might accrue from investing. Additionally, the literature indicates that more wealthy people are on average more risk tolerant since they are in a better position to take higher risks (Al-Ajmi, 2008). These findings are realistic but they may also explain the seemingly less risk tolerance by female investors, given that women accumulate less wealth than men, and they are subject of less yearly or monthly income, which will subsequently affect their propensity to bear financial risks. According to the Global Gender Gap report (2015) females to males estimated earned income ratio was 44%. Thus, this fact of lower income may affect females risk preferences (Kumar *et al.*, 2015). Neelakantan (2010) in his study proposed that the lower risk propensity of women might magnify the gap in wealth between males and females as it counts for 10% of this gap on his study. On the other hand, Faff *et al.*,(2008) study indicate a negative relationship between income and financial risk tolerance, where individuals with less income were more risk tolerant than their richer counterparts, which can be explained by the strong desire of un-wealthy people to become wealthy that influence them into taking substantial risks. However, such negative relationship is infrequent in the literature (Sweet, 2013).

In conclusion of this section, the interactions between the demographic factors and gender in formulating different risk preferences among the investors emphasize the importance of including these factors in the research. In order to assess the effect of gender on risk taking behavior accurately, the effect of the important demographics as age, income

and education need to be included in the process. Moreover, it is apparent that the literature is diverse and conflicting on the topic of demographics effect on risk tolerance and the debate on this relationship is not resolved yet. Sweet (2013) stated that although the literature regarding the gender factor is in general consensus, it is regarding the other demographic factors as (age, education and income) is rather inadequate or inconsistent. However, this debate can indicate an important fact about risk attitude, which is its dynamic and changing nature that interact flexibly with inner biological and psychological factors as well as outer social and environmental factors in order to reform a unique individual or collective risk attitude. Reviewing the literature also indicates the complicated nature of risk that goes beyond the influence of the demographic characteristics where it can be used as starting point in assessing investors risk tolerance (Grable & Lytton, 1998). This study is aiming to contribute to this area of research, thus a focus on recent research was maintained. Accordingly, we form the research second null and alternative hypotheses.

H₂₀ = Demographic variables does not interact with gender to determine differences in risk preference.

H_{2a} = Demographic variables interact with gender to determine differences in risk preference.

2.4 FACTORS INFLUENCE DIFFERENCES IN RISK TAKING AMONG GENDERS

Generally, the differences in investment pattern between males and females are attributed to two main sets of factors, namely, psychosocial and social factors (Olsen & Cox, 2001). Additionally, in some studies those differences were also attributed to biological factors (Kuhnen & Chiao, 2009; Lemaster & Strough, 2014). However, risk preferences is a complex procedure that involves biological, psychological, social and contextual factors. Three of the main affecting factors is reviewed in this section.

2.4.1 THE SOCIAL FACTORS

People enact their gender according to the existing social context (Lemaster, 2014; Lemaster & Strough, 2014). In their study of male and female financial managers and risk-taking behavior, Olsen & Cox (2001) found that risk differences remain significant between professionals after controlling for age, education, wealth and experience. They stated, “Although the precise reason for this gender difference in risk taking is unknown, it appears to be related to evolutionary and social factors”.

It was mentioned in the literature that there is a relationship between risk taking, *gender stereotyping* and *internalization*. Granié (2009, p. 1277) defines gender stereotyping and gender roles as “the set of beliefs about what it means to be a male or a female in terms of physical appearance, attitudes, interests, psychological traits, social relationships and occupations.” Further, she states that the *gender stereotype conformity* explains how risk taking differs from one person to another in the same sex group as well as the differences between men and women. Moreover, she presents the concept of *internalization*, the process by which individuals adopt the values, beliefs, perspectives and attitudes of the people around them as their own. She concludes by stating that the findings

of her study, which is on the effect of stereotype conformity on the risk-taking among adolescent pedestrians, are applicable on other domains as well: “The internalization of rules, i.e. transforming social rules into self-regulated behaviors, may partially explain adolescents’ behaviors when faced with risks in several domains” (Granié, 2009, p. 1281).

Further, Jianakoplos & Bernasek (1998) found that females’ risk aversion was related to the number of children they have. Additionally, on the social effects on gender differences in cooperative risk-taking, Fischer & Hills (2012) findings comply with the *parental investment theory*, which states that, women mostly avoid risk-taking when they have a child as called “the baby effect”.

Moreover, men are more inclined to risk-taking in situations where they find themselves in competition with other men, but showed no change in level of risk-taking when paired with woman or child. These researches suggest that the social context is related to the individual’s risk preferences, therefore one can conclude that changes in social environment and contextual circumstances may lead to changes in risk preferences for both genders.

2.4.2 THE PSYCHOLOGICAL FACTORS

In a review of the literature, psychological factors plays a significant role in predicting financial risk attitudes (Croson & Gneezy 2009; Hardies *et al.*, 2013; Lemaster & Strough, 2014; Jacobsen, et al., 2014). Risk tolerance components are the ability to take risk represented by the personal factors as age, income and education, and the willingness to take risk where the psychological factors are present (Sweet, 2013). This explains the differences between individuals in their risk aversion attitudes irrespective to the similarities they share on the personal or situational information.

Croson & Gneezy (2009) have identified three of the psychological factors mentioned as possible reasons of the differences between genders in risk-taking behavior. The first factor is the *emotional reaction* towards risky situations. Where women were more likely to experience more emotions when facing a risky situation, which will eventually lead to a higher risk aversion degree.

The second factor is *overconfidence*. While men appear to be more overconfident, they tend to put themselves in riskier situations than women do. In this regard, Hardies *et al.*, (2013) attempted to investigate the effect socialization on the gender differences in risk taking. They have proved that, provided with occupational socialization, women get as overconfident as men and sometimes even more. However, they are still more risk averse than men, even though they have enough socialization opportunities. The last factor presented by the authors is the *interpretation of risky situations*. While men tend to view risk as a challenge that need them to sharpen their skills and compete, women tend to view risk as threat to be averted and as potential losses that should be avoided.

Furthermore, Jacobsen, *et al.*, (2014) provided alternative explanations for the differences between men and women in stock holdings. They refer these differences in asset allocation to the *standard portfolio theory* which states “the differences in asset allocation, among investors in general, is due to *different expectations* about future returns and/or *different perceptions* of the riskiness of financial markets.” Therefore, they investigated the gender differences in optimism and perceptions of financial markets. They found that optimists hold more risky assets, by 50% of their portfolios, while pessimistic investors have less risky holdings, constituting only 35% of their portfolios. They also found that men are on average more optimistic as they have a brighter expectation of the

future economic conditions and the stock market performance. On the other hand, women were found to be pessimistic about the future of the economy and market performance.

2.4.3 THE BIOLOGICAL FACTORS

In the literature, the relationship between the biological factors characterized by hormones and genes and risk taking behavior was discussed (Kuhnen & Chiao, 2009; Lemaster & Strough, 2014; Meier-Pesti & Penz, 2008). Lemaster & Strough (2014) in their study of the association between biological traits and financial risk tolerance, found no significant relationship between (2D:4D) ratio -testosterone measure- and financial risk tolerance. However, they found a significant relationship between social role and personality traits in explaining financial risk tolerance level in men and women. Nevertheless, gender socialization effect is argued to be the leading factor in influencing the risk taking behavior among genders, in that males and females tend to behave according to the society expectations irrespective to their biological gender. Moreover, it was argued in the literature that financial knowledge and experience made those evolutionary differences fade (Hibbert et al., 2013; Martenson, 2008; Sebai, 2014). Montford & Goldsmith (2016) stated that when testing for the effect of both gender and level of self-efficacy in executing financial decisions simultaneously, the effect of gender almost disappeared, which strengthen the point of view that the gender differences is affected by the self-reported level of knowledge and self-confidence in financial decisions making rather than the biological gender.

In brief, the literature did not come to a single factor as the main reason behind these differences. Hitherto it proved that these reasons are outcomes of both nature elements, nurture factors and combination of the two. (Croson & Gneezy, 2009).

2.5 GENDER DIFFERENCES IN SAUDI ARABIA

The academic literature on the setting of Saudi Arabia is not rich; however, limited researches addressed a number of context-special factors that affect the business and financial domain in Saudi Arabia (Alkahtani, *et al.*, 2013; Azhar, N., 2014; Sadi & Al-Ghazali, 2010; Zamberi, 2011). These factors influence risk profiles of the investors and the differences in risk attitudes among genders in financial decision-making. These factors include the quasi-dominance of the Saudi financial markets by male investors, which causes a lack of exposure of female investors to the current investment opportunities. Further, in a related issue, there is also a lacking in investment advisory services specifically provided to Saudi female investors. This subsequently may refrain Saudi female investors from undertaking financial markets' investments. Moreover, trading in the Saudi financial market exposes small investors to the risk of trading under asymmetric information, which is a kind of risk that generally female investors are unlikely to favor, while, it is mostly accepted by male investors.

The recent literature suggests that financial risk tolerance in Asia is on average lower than Europe, and it is in Europe lower than in the U.S market (Brasoveanu *et al.*, 2008), however, older studies points that some Asian populations as china are more risk seeking than the U.S market participants (Hsee & Weber, 1999). Wong (2011) concluded that Australians have the highest risk tolerance compared to the United States investors, where the united Kingdom comes last in the level of financial risk tolerance. These proposals evidently show that the investor's level of risk is moderated by social, cultural, political and environmental factors. Due to these dissimilarities, it is vital for every economy to

assess the financial risk trends within its own context in order to facilitate policy-making and financial market development.

The aim of the following section is to address the main social factors unique to the Saudi society that contribute to the appearance or nonappearance of gender gap in financial risk tolerance due to the sensitivity of risk attitudes to the environmental context and sociographic factors. Firstly, we discuss a number of factors that may contribute to the appearance of differences in risk behavior among genders in Saudi Arabia.

Lack of exposure to the financial environment

Root *et al.*, (2014) in their study comparing the level of financial risk tolerance between the financial markets participant in U.S and Uganda came to imperative results regarding the effect of proper financial exposure and experience. They concluded that individuals who has less chances to participate in formal financial markets would subsequently view risk differently than their counterparts who had the chance to participate in the financial markets and build confidence.

Azhar, N. (2014) in her study of the diversity in the Saudi financial markets, she elaborated on the lack of gender diversity in the financial markets in KSA. As an Islamic country, Islam have guaranteed the right of financial equality between men and women, but in the practical reality, there is a tangible gender gap. Women have fewer opportunities especially in the work force, where women used to be entirely prohibited from work, and then they had the opportunity to work in certain jobs such as teaching until recent years. The lack of work opportunities led to lack in funds to be invested by the female investors. She attributed that to the cultural ideologies of the society and the male-centered

organizational structure of the Saudi framework. Those two reasons are dependent on the nature of the country in its early days, where women were eliminated from being part of the outer business circle, and they were only to practice small handicraft businesses in female's societies, and in smaller business circles that could only involve family members or small neighborhoods. Thus, the current government encouragement for women to join the labor force will lead to better female representation in the financial markets.

According to the Global Gender Gap report¹, (2014) Saudi Arabia made an evident change by being the most developed country in the index of economic and financial opportunities *in comparison* to where it was in 2006 where it had the third largest gender gap in the world. In 2014, Saudi Arabia was ranked as number 130 out of 142 countries in its overall efforts made to redeem the gender gap in education, health, politics, and economic participation. Considering the sub-Index of economic Participation Gender Gap separately, Saudi Arabia is reported to be among the ten lowest performance countries compared to the other 142 countries, even though it has the highest change ratio in 2014 over the past 9 years. It was also the second lowest performance country in the sub indicator of enterprise and leaderships gender parity. Saudi Arabia also has a low ratio of 49% in gender equality of estimated earnings according to the report. Through taking a closer look to these four sub indicators, we find that Saudi Arabia has almost no gender gap when it comes to health and education as the ratios of equality are 97% and 98.6% respectively. On the other hand, Saudi women are participating with only 38.9% of the male's economic participation and a very small participation when it comes to political empowerment with

¹ The Global Gender Gap report is providing a yearly index that ranks countries according to calculated gender gaps in four main domains namely, education, health, politics, and economic participation where each domain has its own sub-indexes. This report is introduced by the world economic forum that is best known for its yearly meeting in Davos.

a ratio of 7.6% of male's participation. These ratios remained almost the same in the following year with a slight decline. In 2015, Saudi Arabia dropped four places from 2014 and was among the worst performing countries in gender equality in high-income countries group; due to lack of gender equal economic participation. The female to male ratio in labour force participation was 27%, and the wage equality was only 60%. The effect of this economic and political gap is tangible in Saudi but these ratios are expected to perform significantly better in the future due to the educational attainment equality, which will eventually raise a higher awareness of gender parity in general in all life aspects.

Cultural ideologies

The Social Institutions and Gender Index (SIGI)² stated in its 2014 report that the sub-index of genders accessibility to the financial services in Saudi Arabia, that genders had equal rights in owning property and businesses. However, this is not totally utilized in practice due to social and legal aspects that limit women from benefiting from the general equality guaranteed by the law of Sharia, as women needed a male's permission to start a business or even take a bank loan. This was until 2005 when these restrictions were sealed, despite the high movement restriction, which is still a debate point in Saudi Arabia. The rating given in the report to Saudi Arabia represents general gender financial access equality, guaranteed by the law but not fully utilized in practice due to social custom or traditions. Those circumstances obstructed women in Saudi Arabia from exercising their financial rights and getting proper exposure to the financial practices and environment. Sadi & Al-Ghazali (2010) in their study of Saudi female entrepreneurs found that the main

² The Social Institutions and Gender Index (SIGI) is designed to measure gender equality in the society, and introduced by the Organization of Economic Co-operation and Development (OECD).

obstacle faced by female entrepreneurs in Saudi is traditional restrictions due to socio-cultured values and traditions that impeded them from contributing to their own wellbeing and the wellbeing of their country.

Male-centered organizational structure

Most of the organizations all over Saudi Arabia are male-structured organizations except if they were separated, female-only organizations. This structure led to communication gap that can affect the risk tolerance by a number of means. Firstly, the lack of information communicated will significantly affect the female's aspirations to participate; where female investors are information-oriented, they tend to view lack of information as higher risk. Secondly, this communication gap will also lead to a lesser information security (Alkahtani, *et al.*, 2013). The male-structured nature of the organization restricts females from having proper experience and knowledge about the investment environment and the knowledge on starting or running a business since females were obligated to point a male manager to run the business until 2005 (Zamberi, 2011).

These three factors among others contribute to the gender differences in risk tolerance and are related to the nature of Saudi Arabia. However, as countries become more democratic, gender disparity minimizes which provides a healthier atmosphere for both sexes to participate in the growth of their countries.

On the other hand, there are factors special to Saudi Arabia that may lead to nonappearance of any differences in risk attitudes among genders. These factors include the educational attainment parity, females' financial position and economic participation, these factors are discussed below.

Educational attainment parity

In 2015, according to the gender gap report, Saudi was of the best performing countries in education attainment parity, as the fifth most improved country in the world in educational attainment equality by a literacy rate of 94%. The literature suggests that general formal educated individuals tend to be more risk tolerant than their non-educated counterparts (Al-Ajmi, 2008; Kumar *et al.*, 2015; Riley *et al.*, 1992; Wong, 2011); where both genders become more risk tolerant since they can make more informed decisions. Further, Grable & Lytton (1999a) stated that the level of education a person has is the most distinctive factor in classifying individuals into risk tolerance groups, where the education variable was considered the optimum variable irrespective to gender. Thus, the current education system in Saudi can positively affect risk tolerance among genders.

Economic participation

In 2016, Saudi Arabia made the second largest improvement on economic participation and opportunity globally (Global Gender Gap report). This improvement indicated the increment in financial participation equality, which increases females' financial exposure and experience. Sebai (2014, p. 318) stated, "When having financial expertise, women become more risk seeking", which supports the positive significant relationship between self-perceived level of knowledge and risk tolerance found by Adhikari & O'Leary in 2011. Root *et al.*, (2014) concluded that Proper financial exposure represented by providing more chances to investors to participate in formal financial markets was clearly related to financial risk tolerance, as it leads to better understanding of financial markets, and yields a higher confidence in financial decision-making.

Females' financial position

Females in Saudi Arabia are in powerful position to take risks since they are in general responsible from the males in the society by the social norms and the law of shariah. They are provided with their basic needs which entitled them to take higher risks. Additionally, the statistics on the economic conditions of Saudi women shows that Saudi women have 62 billion SAR in banks that represents 70% of the banks deposits. They also own 20% of corporate shares and 15% of the private business (Abdul Ghafour, 2004). They also own 40% of the private wealth on Saudi (Doumato, 2003). This indicates that Saudi females has an advantage in taking higher risks depending on their economic conditions.

2.6 SUMMARY

This chapter reviewed the main views in the literature regarding gender differences in financial risk tolerance. The body of literature on gender difference in risk tolerance mainly constitutes of two views. The first view states that women are on average more risk averse than men (Casanovas, & Merigó, 2012; Charness, & Gneezy, 2012; Eckel & Grossman, 2002; Jianakoplos, & Bernasek, 1998; Neelakantan, 2010). From this view, comes the hypothesis that gender-based differences are not applicable on the sub-population of professionals in the field of finance and investment (Adhikari & O'Leary, 2011; Hardies, *et al.*, 2013; Kumar *et al.*, 2015 Martenson, 2008; Wong, 2011). The second part of the literature showed opposing view and concluded that there is no significant gender difference in financial matters (Casanovas & Merigó, 2012; Deaves *et al.*, 2007; Schubert *et al.*, 1999; Qiao, 2012).

Moreover, the demographics effect on risk tolerance was reviewed. This review indicates that the literature is diverse and conflicting on the topic of the demographics effect on risk tolerance and the debate on this relationship is not resolved yet. (Sweet, 2013). Additionally, the possible reasons of different risk preferences between genders that was discussed in the literature was also reviewed. The literature has not come to an exact reason or reasons that influence the differences in risk approaches among the investors. Hitherto it proved that understanding risk attitude is a complicated and advanced procedure and that these reasons are outcomes of both nature elements, nurture factors and combination of the two (Croson & Gneezy, 2009).

This study is aiming to address the significance of a number of these factors on risk preferences among professionals in Saudi. Thus, a number of factors that is special to the context of Saudi Arabia was also discussed. The methodology and research design used to accomplish this study is deliberated in the following chapter.

3 METHODOLOGY

3.1 INTRODUCTION

The literature appeared to be diverse and conflicting on the topic of the demographics effect on risk tolerance and the debate on this relationship is not resolved yet (Gibson *et al.*, 2013). Sweet (2013) stated that the literature regarding demographic factors as (age, education and income) is rather inadequate or inconsistent. Thus, the problem explored in this study came from the lack of consensus on whether the demographic characteristics of the individuals, contribute to their personal level of financial risk tolerance. If specific demographic characteristics can be linked to the financial risk behavior, these factors may serve in financial advisory industry and in personal risk management as well as portfolio construction and products selection.

The methodology chapter provides a description of the design, methods and the tools used to answer the research questions. The first section of this chapter describes the design of the research and methods, where the quantitative approach of the study and the statistical tests used are elaborated. Followed by the data and sample section that provides a discussion of the population of the study and sample selection as the second section. The third section describes the Grable & Lytton 13-Item scale (Grable, J., & Lytton, R. H., 1999) as the instruments used to collect the data of this research, along with a discussion of its previous use, reliability and validity.

3.2 RESEARCH DESIGN

The method of this study is quantitative, where the researcher is examining the relationship between financial risk tolerance to each of the demographic variables namely, gender, age, marital status, education and income. This study was accomplished via on-line survey to obtain the data on the variables from the representative group. Afterward, statistical analysis was performed on the data. The purpose of the study is to investigate the nature of the relationship between the variables of the study and whether it exists. To answer the first question of the research,

Q1. What relationship exists between risk tolerance and gender in Saudi Arabia?

An independent sample t-test was used to investigate any significant differences in financial risk tolerance in the mean scores for the two gender groups, male and female (as in: Adhikari & O'Leary, 2011; Anbar & Eker, 2010). Secondly, as a robustness test, a chi-square test of independence (as in: Adhikari & O'Leary, 2011; Anbar & Eker, 2010; Lemaster, 2014; Root *et al.*, 2014) was used to investigate the association between gender and the levels of financial risk tolerance.

To answer the second question of the research,

Q2. How does other demographic variables interact with gender in determining risk preferences in Saudi Arabia?

Two-way ANOVA was used (as in: Adhikari & O'Leary, 2011; Anbar & Eker, 2010; Lemaster, 2014; Wong, 2011) to simultaneously test for the effect of each of the independent variables on the dependent variable, and also identifies any interaction effect between the independent variables. Four different two-way ANOVA tests was applied to

examine the relationship between gender and each of the demographics namely, age, education, marital status and income on financial risk tolerance, and if any of these demographics interact with gender in determining the level of financial risk tolerance.

Furthermore, multivariate analysis of variance (MANOVA) was conducted (as in: Lemaster, 2014), to examine the differences between the demographic groups as the independent variables, and the financial risk tolerance three domains of risk measured by the Grable and Lytton scale: investment risk, risk in comfort and experience in financial matters and speculative risk (Gilliam *et al.*, 2010) as the dependent variables.

3.3 DATA AND SAMPLE

The data source to obtain the results is based on primary data. The literature has examined gender differences in financial risk taking in different populations at the business and financial domain or outside this domain. The empirical studies have examined these differences among business students as potential investors (Ahmed N., 2012; Qiao, 2012), business professors (Casanovas & Merigó, 2012; Hibbert *et al.*, 2013), business owners and CEOs (Martin & Williams, 2009; Faccio, Marchica & Mura, 2012), financial managers (Beckmann & Menkhoff, 2008; Olsen & Cox, 2001), Banks and financial institutions employees (Adhikari & O'Leary, 2011) and random populations of the public (Riley *et al.*, 1992).

In this study, since financial literacy was desired, a sample of Saudi banks and financial institutions' employees (as a proxy for professionals) was used for the following reasons: firstly, the banking and finance sector shows the highest level of gender diversity among other sectors in Saudi Arabia (Azhar, N., 2014). Secondly, banks and financial

institutions employees are in continues communication with clients and investors evaluating and reviewing their risk profiles and level of risk tolerance. Additionally, they are in endures interaction with financial products and its perceived level of risk and they are familiar with the characteristics and features of these products.

According to the Saudi Arabian monetary authority at the end of 2015, there were 53,748 employees of 25 commercial banks including 12 national banks, providing their services in 1963 branches around Saudi. This number does not include the financial companies' employees or insurance companies. In this study besides the ministry of finance, nine banks, seven financial companies and two insurance companies, were included. Table 1 shows the banks, financial companies and insurance companies included in the sample.

TABLE 1: List of Banks, Financial companies and Insurance companies in the sample

Banks	-Al-Awwal Bank -Banque Saudi Fransi -Saudi Investment Bank (SAIB) - Alinma Bank -Al-Rajhi Bank	-Islamic Development Bank (IDB) -Bank Albilad -Bank Alarabi - Al-Ahli Bank
Financial companies	-Ajil financial company -Dar Altamleek financial company -Moore stephens financial company -Olayan Group investment company	-Kuwait Projects Company(KIPCO) -Assila investment company -KPMG Audit, Tax and Advisory services
Insurance companies	-Bupa insurance company	-Saudi Enaya Insurance company

The sample selection method was purposive sampling, where the sample was subjectively selected based on the characteristics of the population and the objectives of the research. A summary of the population and the sampling method and period is shown

in Table 2. Table 2 also shows the statistical analysis software package used to obtain the statistical results.

TABLE 2 Sample selection and analysis

Sample population	Saudi banks and financial institutions employees
Sample Selection	purposive sampling
Field Period	27 July -12 December
Statistical Analysis	Statistical Package for the Social Science (SPSS) V.22

3.4 THE TOOLS

There are mainly two ways to measure individuals risk preference. Firstly, self-perceived level of risk obtained by questionnaires that is used widely in the literature. Secondly, asset allocation as an indicator of individuals risk level (Yang, Y., 2004). From another perspective, Sweet (2013) grouped the methods used in the literature to measure risk into two groups, first, objective methods consists of lottery choice experiments, second, subjective methods through psychometric approach based on scales and questionnaires that contain subjective questions related to hypothetical situations and/or investment choices.

According to Hanna, *et al.* (2001) there are three sub-methods that fall under the self-perceived level of risk method. These methods are questions about investment choices such as portfolio allocation, a combination between investment and subjective questions and questions about hypothetical scenarios. The method used in this study to assess the level of risk tolerance is the second sub-method, which is a mixed method of both investment choices questions and subjective questions. The main limitation of this method as stated by the authors is that the current situation of the respondent will affect their answers as well as their limited knowledge.

The Grable and Lytton (1998) (G&L) risk tolerance scale was developed by John Grable, professor of financial planning and consumer economics at the University of Georgia, and Ruth Lytton, professor of agricultural and applied economics at Virginia Tech University. The scale was reduced from 100 to 13 questions after reviewing industry and academic journals based on validity, univariate, and multivariate item tests (Sweet, 2013). The scale scores that ranges between 13 and 47 will assess the risk tolerance level of the

sample (Faff, *et al.*, 2011; Lemaster & Strough, 2014). The underlying theories of the scale is the scale development theory and the modern portfolio theory (MPT) (Markowitz, 1952) that theoretically describes the positive relationship between risk and return in that if an individual is seeking higher returns he must be willing to accept higher volatility in his investment portfolio. (Kuzniak, *et al.*, 2015). According to the MPT, the degree of risk tolerance is associated with actual financial behavior. Asset allocation that is cash and bonds oriented are associated with lower risk tolerance while investing in stocks are related to relatively higher risk tolerance.

Grable and Lytton stated if the 13-items scale is valid, then the scores of the scale should be reflective of actual investment behavior. Thus, in 2003 they conducted a follow-up concurrent validity study of their scale. They used both bivariate and multivariate analysis controlling for age, gender, marital status, income and education since these factors can moderate the degree of risk tolerance as reported in the literature. They compared the results of the scale with the actual investor's behavior and found that the scale scores corresponds to the investors' actual risk taking behavior. The scale scores were positively related to investments in equities and negatively related to cash holdings. These finding are in line with the assumption of risk and return relationship on portfolio constructing derived from the modern portfolio theory.

This financial risk tolerance scale is widely used by financial advisory industry and in financial research; it has been validated on a large life span sample. The scale is also widely used by academic researchers around the world (for recent use see: Anbar & Eker, 2010; Chattopadhyay & Dasgupta, 2015; Chavali & Mohanraj, 2016; Root *et al.*, 2014 among others) and by policy makers on a state and federal level (Sweet, 2013). It showed

constant results with real investments of the clients in that the higher the score of the scale (higher risk tolerance) was related positively to investments in stocks while negatively to investments in bonds as a proxy of lower risk investments. (Lemaster & Strough, 2014). Gilliam *et al.*, (2010) compared between two of the widely used risk assessment tools. Namely, the 13-item Grable and Lytton scale and the single question survey of consumer finance (SCF). Using t-test and chi-square to test for significant differences in risk tolerance attitude between demographic groups in both scales, and tobit regression model to assess the relationship between the risk tolerance degree and asset allocation. They found that the Grable and Lytton scale has more explanatory power than the single question of SCF.

The justification of choosing this scale in particular is its distinct features as summarized by Kuzniak *et al.*, (2015, p. 178) “(1) the multidimensionality of risk tolerance was assessed through the inclusion of simple and complex situational items, (2) the items were consistent and not redundant, (3) the items were interesting to answer, and (4) completion times would be reasonably short”. In their research, they studied the performance of the scale over 7 years (2007-2015) on a sample of 160,279 respondents who took the survey in that time span. The scale’s estimated Cronbach’s α was 0.77 during the period of 2007 until 2013 which indicates the soundness and reliability of the scale. The scale is measuring three dimensions of risk: investment risk in questions 4,5,8,11 and 12 and risk in comfort and experience in financial matters in questions 1,3,6,7 and 13, and speculative risk in questions 2,9 and 10. (Gilliam *et al.*, 2010).

3.5 SUMMARY

The methodology chapter provided a description of the quantitative design of this research, and the statistical tools used to answer the research questions. The data source to obtain the results was based on primary data. The study was accomplished via on-line survey. The population of the study consists of professionals in the financial and banking sector in Saudi Arabia. The sample selection was purposive where the sample was subjectively selected based on the characteristics of the population and the objectives of the research. The Grable & Lytton 13-Item scale (Grable, J., & Lytton, R. H., 1999) was used to collect the data. The (G&L) scale is widely used by academic researchers around the world (for recent use see: Anbar & Eker, 2010; Chattopadhyay & Dasgupta, 2015; Chavali & Mohanraj, 2016; Root *et al.*, 2014 among others) and by policy makers on a state and federal level (Sweet, 2013). The scale's estimated Cronbach's α was 0.77 during the period of 2007 until 2013 which indicates the reliability of the scale.

Afterward, statistical analysis was performed on the data. An independent sample t-test and chi-square test of independence was used to investigate differences between males and females in terms of their financial risk tolerance levels. In addition, two-way ANOVA was conducted to simultaneously test for the effect of each of the independent variables namely, gender, age, education, marital status, and income on the dependent variable financial risk tolerance, and to identify any interaction effect between the independent variables that may affect the dependent variable.

The next chapter provides the results of the statistical tests applied on the data along with the discussion of the results.

4 RESULTS AND DISCUSSION

4.1 INTRODUCTION

This study had five independent variables and one dependent variable. The independent variables are the demographic factors namely, gender, age, income, education and marital status and the dependent variable is financial risk tolerance. All variables are obtained from the online 18 questions survey, where the sum of the first 13 questions counts for the risk tolerance score followed by five questions regarding demographic variables (Appendix A). The results chapter is divided into three sections. The first section includes a discussion of the data collection and processing, followed by data screening and descriptive statistics in the second section. In the third section, results of the statistical tests and hypotheses testing is provided. Lastly, a summary of the results is delivered.

The G&L financial risk tolerance scale was professionally translated to Arabic, and distributed electronically via E-mail to the targeted institutions. Moreover, the scale was made to be interactive where the respondent can know their personal level of risk tolerance according to the scale to increase the responding ratio. The participation was voluntary and nameless. A link of the survey was sent to the intended institutions via E-mail. 309 responses were received and 65 was excluded incomplete responses. 244 complete responses were analyzed. Appendix (A) shows the 13 questions instrument along with the five questions regarding demographics. The data obtained was downloaded into an Excel file then exported to SPSS.

The independent variable gender was indicated in the survey and represented by a nominal value. While age, marital status, education and income were each indicated by a

specific categorical answer and then each was assigned a nominal value. The dependent variable that measures financial risk tolerance level was automatically calculated by taking the sum of the first 13 questions score for each respondent and classify each score into five basic categories as follows:

- 18 or below = Low risk tolerance (i.e., conservative investor)
- 19 to 22 = Below-average risk tolerance
- 23 to 28 = Average/moderate risk tolerance
- 29 to 32 = Above-average risk tolerance
- 33 and above = High risk tolerance (i.e., aggressive investor).

The results of risk tolerance levels of the sample are given in Table 3. Table 3 shows that the majority of the sample have moderate risk tolerance level by 41.8% of the total sample. While 40.8% of the male sample had moderate risk tolerance, and 43.1% of the female sample was in the average-risk tolerance category. From the male sample, 20.4% and 14.7% from the female sample were in the high-risk tolerance category.

TABLE 3: Levels of risk tolerance in the sample.

Risk level of the sample	All sample	Male sample	Female sample
Low risk tolerance	13(5.3%)	8(6.5%)	5(4.9%)
Below-average risk tolerance	34(13.9%)	17(12%)	17(16.7%)
Average/moderate risk tolerance	102(41.8%)	58(40.8%)	44(43.1%)
Above-average risk tolerance	51(20.9%)	30(21.1%)	21(20.6%)
High risk tolerance	44(18%)	29(20.4%)	15(14.7%)
Total	244	142	102

4.2 DESCRIPTIVE STATISTICS

In order to obtain the statistical analysis, SPSS was used. Firstly, we ran the tests to screen the data for normality and outliers. Since the variables was measured by a Likert scale without open questions where all answers was in a predetermined range, there is no outliers in the data, and because skipping questions was not allowed there was no missing values. Moreover, by comparing mean, median and mode for each variable as well as skewness and kurtoses was examined in all variables of interest, we conclude that distribution is fairly normal for all the variables of interest. Descriptive analysis of the study variables was obtained to determine the characteristics of the sample. The results of descriptive analysis and data screening are presented in Table 4.

TABLE 4: Descriptive statistics, normality and reliability

	N	Minimum	Maximum	Mean / Mode*	Std. Deviation	Skewness	Kurtosis	Reliability
financial risk tolerance	244	16	44	27.27	5.306	.176	-.316	0.664
Age	244	18.00	56.00	33.1148	6.82792	.577	.079	-
Gender	244	1	2	1*	-	-	-	-
Marital status	244	1	3	2*	-	-	-	-
Education	244	2	5	4*	-	-	-	-
annual gross income	244	1	5	2*	-	-	-	-

Note:*Mode was reported as a measure of central tendency for categorical variables such as gender, marital status, education and annual gross income.

Financial risk tolerance and Age are continuous variables. Whereas, gender (Male = 1 & Female = 2), marital status (Never Married = 1, Married = 2, Separated and Divorced = 3), education (High school graduates = 1, Some college or vocational training = 2, Bachelor degree = 3, Graduate or professional degree = 4) and annual gross income (less than 60,000 RS p.a. = (1), 61,000 – 120,000 RS = (2), 121,000 – 240,000 RS = (3), 241,000 – 480,000 RS = (4), more than 480,000 RS = (5), were measured as categorical variables.

The central tendency of the numerical variables represented by the mean. The average of the dependent variable financial risk tolerance is 27.27. While the average of the independent variable age is 33 years (SD = 6.82). The spread of the variables from their mean is described by the standard deviation. The standard deviation of the dependent variable financial risk tolerance is (SD = 5.3). The skewness of both variables is near zero and are in the acceptable range of (-1 and 1), In addition, the kurtosis of the variables is also in the acceptable range of (-2 and 2), which indicates the symmetric distribution of the variables. The mode of the categorical variables indicated that the majority of the sample are males, where in the second variable, marital status the majority of the sample are married. The mode of the education variable indicates that the majority of the sample holds bachelor degree, where for the variable income most of the sample received 61,000 – 120,000 RS per annum.

Reliability analysis of the financial risk tolerance scale is given in the last column of Table 4. Reliability for only risk tolerance level was computed because it was the only numeric variables measured using multiple items. The risk tolerance scale showed acceptable reliability ($\alpha = 0.664$) as mentioned by (Hair *et al.*, 2006; Lance *et al.*, 2006).

The demographic distribution of the sample is given in Table 5. Table 5 showed that the sample (N = 244) constitutes of 58.2% males and 41.8% females. 61% of the sample are married while 30% never married, and 9% separated individuals. Regarding education level, the majority of the sample (59.8%) have bachelor degree, where 18.4% have graduate or professional degree, 12.3% of the sample had some college or vocational training and 9.4% of the sample are high school graduates. Regarding the annual gross income of the sample, 21.7% have less than 60,000 RS a year, 43.9% receive 61,000 – 120,000 RS yearly,

where 25.4% receive 121,000 – 240,000 RS a year, 7% have 241,000 – 480,000 RS yearly and only 2% with more than 480,000 RS a year.

TABLE 5: Demographic Profile of the respondents

Variable	Categories	Frequency (%)
Gender	Male	142(58.2%)
	Female	102(41.8%)
Marital Status	married	148 (61%)
	never married	77(30%)
	separated	19(9%)
Education	High school graduates	23(9.4%)
	Some college or vocational training	30(12.3%)
	Bachelor degree	146 (59.8%)
	Graduate or professional degree	45(18.4%)
Income	less than 60,000 RS p.a	53(21.7%)
	61,000 – 120,000 RS	107(43.9%)
	121,000 – 240,000 RS	63 (25.4%)
	241,000 – 480,000 RS	17(7%)
	more than 480,000 RS	4(2%)

The following graphs display the data in table. 5

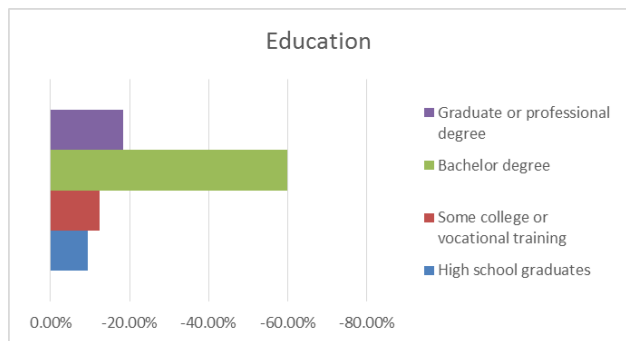


FIGURE 1 EDUCATION LEVEL OF THE SAMPLE

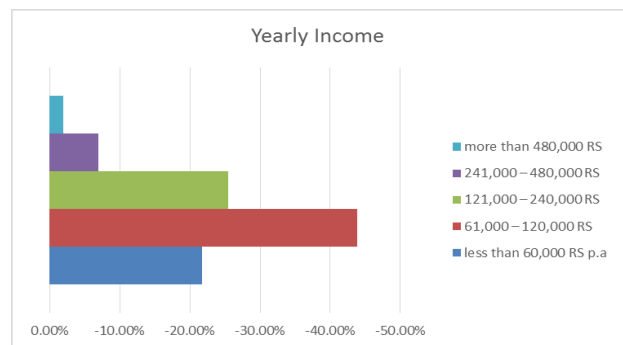


FIGURE 2 INCOME LEVEL OF THE SAMPLE

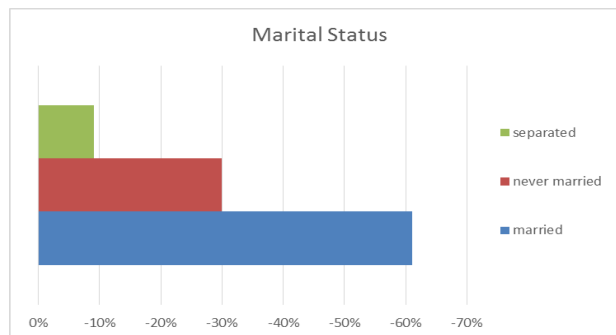


FIGURE 3 MARITAL STATUS OF THE SAMPLE

4.3 HYPOTHESES TESTING

The objective of first hypothesis was to test the gender difference in risk tolerance levels. H_{10} = There is no significant difference in the risk preference between male and female.

Therefore, an independent sample t-test was used. Of the two variables used, the risk tolerance level was numerical variable measured on a continues scale where the second variable gender was measured as a dichotomous variable on a nominal scale. An independent sample t-test was used to investigate any significant differences in financial risk tolerance in the mean scores for the two gender groups, males and females (Adhikari & O'Leary, 2011; Anbar & Eker, 2010).

The results showed that there was no significant effect of gender [$t(242) = 1.377$, $p = .162$] on financial risk tolerance level as measured by the Grable & Lytton risk tolerance scale (Grable, J., & Lytton, R. H., 1999). Thus, the null hypotheses cannot be rejected based on the findings of independent sample t-test. Thus, in our sample, we do not find a statistically significant difference between males and females in terms of their financial risk tolerance (Adhikari & O'Leary, 2011).

Secondly, as a robustness test, a chi-square test of independence (Adhikari & O'Leary, 2011; Anbar & Eker, 2010; Lemaster, 2014; Root *et al.*, 2014) was used to investigate the association between gender and the levels of financial risk tolerance, where financial risk tolerance was categorized into five levels namely, low, below-average, average, above-average, high risk tolerance. The second variable gender was measured as a dichotomous variable on a nominal scale. The results indicate that there was no

significant association between gender and financial risk tolerance levels [$\chi^2(4, N = 244) = 2.16, p = .71$] as measured by the Grable & Lytton risk tolerance scale. Based on this analysis, we do not reject the null hypothesis. Thus, in our sample there is no significant association between gender and financial risk tolerance levels.

The objective of the second hypothesis in the study was to examine if the demographic variables interact with gender to formulate different risk preferences.

H2₀ = Demographic variables namely, age, marital status, education and income interact with gender to determine difference in the risk preference.

Two-way ANOVA was used (Adhikari & O'Leary, 2011; Anbar & Eker, 2010; Lemaster, 2014; Wong, 2011) to simultaneously test for the effect of each of the independent variables on the dependent variable, and identifies any interaction effect between the independent variables represented by the demographics, on the dependent variable financial risk tolerance. Following the results of four “two-way ANOVA” tests that examined the interaction effect between gender and the other demographics namely, age, marital status, education and income on the dependent variable financial risk tolerance.

Gender and age

$$RTS = \beta_0 + \beta_1 (\text{gender}) + \beta_2 (\text{age}) + \beta_3 (\text{gender*age})$$

Where, RTS= risk tolerance score by Grable and Lytton scale (1998), numerical variable.

β_0 = the intercept.

Gender = a dummy variable takes the value of unity for female and (0) if male.

Age = categorical variable takes the value of 1 = respondent's age is 29 years or less, 2 = 30-45 years, 3 = 46 years or more.

Table. 6 shows the results of the two-way ANOVA for the impact of age and gender on financial risk tolerance.

TABLE 6: ANOVA for between subjects effects - gender and Age

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	271.146	5	54.229	1.964	.085
Intercept	24489.872	1	24489.872	887.079	.000
Gender	8.051	1	8.051	.292	.590
Age	166.013	2	83.007	3.007	.051
Gender * Age	72.391	2	36.196	1.311	.271

Dependent Variable: level of risk

The two-way between groups analysis of variance was conducted to investigate the impact of gender and age on the level of financial risk tolerance, as measured by the Grable & Lytton risk tolerance scale (Grable, J., & Lytton, R. H., 1999). Subjects were divided into three groups according to their age (Group 1: 29 years or less, Group 2: 30-45 years, Group 3: 46 years or more). There is no significant main effect of gender [$F(1, 238)=.292$, $p= .59$] on financial risk tolerance, nor age [$F(2, 238)= 3.0$, $p= .05$] independently has a significant main effect on financial risk tolerance. The interaction effect of “Gender * Age” [$F(2, 238) = 1.31$, $p= .27$] indicates that there is no significant difference affected by age on financial risk tolerance among genders. These results are in line with the findings of Anbar & Eker (2010) and Sulaiman, E. K. (2012) who did not find significant relationship between age and financial risk tolerance.

Gender and education:

$$RT = \beta_0 + \beta_1 (\text{gender}) + \beta_2 (\text{education}) + \beta_3 (\text{gender* education})$$

Education = categorical variable assigned the values, if the respondent was High school graduate = 1, Some college or vocational training = 2, Bachelor degree =3, Graduate or professional degree = 4

Table. 7 shows the results of the two-way ANOVA for the impact of education and gender on financial risk tolerance.

TABLE 7: ANOVA for between subjects effects - gender and education

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	229.494	7	32.785	1.170	.321
Intercept	43355.147	1	43355.147	1547.417	.000
Gender	70.199	1	70.199	2.506	.115
Education	126.044	3	42.015	1.500	.215
Gender * Education	20.787	3	6.929	.247	.863

Dependent Variable: level of risk

The two-way between groups analysis of variance was conducted to investigate the impact of gender and education on the level of financial risk tolerance, as measured by the Grable & Lytton risk tolerance scale (Grable, J., & Lytton, R. H., 1999). Subjects were divided into four groups according to their level of education (Group 1: High school graduate, Group 2: some college or vocational training, Group 3: bachelor degree, Group 4: graduate or professional degree). There is not significant main effect of gender [$F(1, 236)=2.506, p= .115$] or education level [$F(3, 236)= 1.5, p= .22$] independently on financial risk tolerance. This means that males and females do not differ in terms of their financial risk tolerance level whether they were high school graduates, bachelor degree holders or graduate or professional degree holders. The interaction effect “Gender * Education” [$F(3, 236)= .247, p= .86$] did not reach statistical significance, which indicates that there is no significant effect of education on financial risk tolerance for males and females. These results are in line with the findings of Deaves *et al.*, (2007) and Hallahan *et al.*, (2003).

Gender and marital status:

$$RT = \beta_0 + \beta_1 (\text{gender}) + \beta_2 (\text{marital status}) + \beta_3 (\text{gender} * \text{marital status})$$

Marital status = categorical variable assigned the values, if the respondent is never Married = 1, Married = 2, Separated and Divorced = 3

Table. 8 shows the results of the two-way ANOVA results for the impact of marital status and gender on financial risk tolerance.

TABLE 8: ANOVA for between subjects effects - gender and marital status

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	205.622	5	41.124	1.475	.199
Intercept	81803.634	1	81803.634	2933.858	.000
Gender	16.696	1	16.696	.599	.440
Marital Status	135.386	2	67.693	2.428	.090
Gender * marital status	33.110	2	16.555	.594	.553

Dependent Variable: level of risk

The two-way between groups analysis of variance was conducted to investigate the impact of gender and marital status on the level of financial risk tolerance, as measured by the Grable & Lytton risk tolerance scale (Grable, J., & Lytton, R. H., 1999). Subjects were divided into three groups according to their marital status (Group 1: never married, Group 2: married, Group 3: divorced or separated). There is not significant main effect of gender [$F(1, 238) = .59, p = .44$] or marital status [$F(2, 238) = 2.43, p = .09$] independently on financial risk tolerance. This means that males and females do not differ in terms of their financial risk tolerance score whether they were never married, married, divorced or separated. The interaction effect “Gender * marital status” [$F(2, 238) = .59, p = .55$] indicates that there is no significant difference in the effect of marital status on financial

risk tolerance for males and females. These results are in line with Adhikari & O'Leary (2011); Anbar & Eker (2010) and Hallahan, *et al.*, (2003), who did not find significant relationship between marital status and financial risk tolerance.

Gender and income

$$RT = \beta_0 + \beta_1 (\text{gender}) + \beta_2 (\text{income}) + \beta_3 (\text{gender} * \text{income})$$

Income = categorical variable assigned the values, if the respondent has less than 60,000

RS = (1), 61,000 – 120,000 RS = (2), 121,000 – 240,000 RS = (3), 241,000 – 480,000 RS = (4), more than 480,000 RS = (5).

Table. 9 shows the results of the two-way ANOVA results for the impact of income and gender on financial risk tolerance.

TABLE 9: ANOVA for between subjects effects - gender and income

Source	Type III Sum of				
	Squares	df	Mean Square	F	Sig.
Corrected Model	331.868 ^a	9	36.874	1.348	.214
Intercept	42428.896	1	42428.896	1551.006	.000
Gender	7.014	1	7.014	.256	.613
Income	117.327	4	29.332	1.072	.371
Gender * Income	109.504	4	27.376	1.001	.408

Dependent variable = level of risk

The two-way between groups analysis of variance was conducted to investigate the impact of gender and annual gross income on the level of financial risk tolerance, as measured by the Grable & Lytton risk tolerance scale (Grable, J., & Lytton, R. H., 1999). Subjects were divided into five groups according to their annual gross income (Group 1: less than 60,000 RS, Group 2: 61,000 – 120,000 RS, Group 3: 121,000 – 240,000 RS, Group 4: 241,000 – 480,000 RS, Group 5: more than 480,000 RS). There is not significant main effect of

gender [$F(1, 217) = .256, p = .61$] or income level [$F(4, 217) = 1.1, p = .37$] independently on financial risk tolerance. This means that males and females do not differ in terms of their financial risk tolerance level irrespective to their annual gross income. The interaction effect “Gender * Income” [$F(4, 217) = 1.0, p = .41$] indicates that there is no significant difference in the effect of income on financial risk tolerance for males and females. These results suggest that differences in financial risk tolerance are not significantly affected by the gender of the individual nor their annual gross income level.

Furthermore, multivariate analysis of variance (MANOVA) was conducted (as in: Lemaster, 2014), to examine the differences between the demographic groups as the independent variables, and the financial risk tolerance’ three domains of risk measured by the Grable and Lytton scale: investment risk, risk in comfort and experience in financial matters and speculative risk (Gilliam *et al.*, 2010) as the dependent variables. The results of the MANOVA test also found no significant effect of the demographic variables, gender, age, education, marital status and income on the three sub-scales of the Grable & Lytton scale namely, investment risk, risk in comfort and experience in financial matters and speculative risk as the dependent variables.

Taking together and based on the analysis, we can not reject the null hypothesis that demographic variables namely, age, marital status, education and income does not interact with gender to determine difference in the risk preference. We conclude that in our sample that consists of professionals in the banking and financial sector in Saudi Arabia, the demographic factors does not seem to significantly affect their financial risk tolerance. (Hallahan, *et al.*, 2003).

In conclusion, this study finds that on our sample, males and females do not significantly differ in their financial risk tolerance. This result is in line with part of the literature that did not find significant differences in financial matters between males and females (Barber & Odean, 2001; Casanovas & Merigó, 2012; Deaves *et al.*, 2007; Schubert *et al.*, 1999; Qiao, 2012). The results is also in line with the literature that examined financial risk behavior in professionals population and found no significant differences in terms of their financial risk tolerance (Adhikari & O'Leary, 2011; Hallahan, *et al.*, 2003; Hardies, *et al.*, 2013; Kumar *et al.*, 2015; Martenson, 2008; Montford & Goldsmith, 2016; Wong, 2011).

The results is also helpful to the financial institutions and investment companies to target the market more efficiently and design their products based on the different risk preferences and trends.

In addition, the demographic factors, namely, age, education, marital status and income, did not have a main effect on financial risk tolerance nor an interaction effect with gender to influence the level of financial risk tolerance. These results indicates the complex nature of risk that goes beyond the influence of the demographic characteristics where it can be used only as starting point in assessing investors risk tolerance (Grable & Lytton, 1998). Moreover, risk tolerance consists of two parts: the first part is the ability to take risk where the personal demographic factors as age, income and education are present. The second part is the willingness to take risk where the psychological factors are present (Sweet, 2013). Thus, the personal demographic factors count only for a part of financial risk tolerance.

4.4 SUMMARY

This quantitative study is aiming to investigate if financial risk tolerance differs among genders. It also aims to examine if the demographic variables namely, age, marital status, education and income interact with gender to determine differences in the risk preference. Firstly, descriptive statistics and demographic distribution of the sample were performed and presented. Secondly, on hypotheses testing, independent sample t-test and chi-square test of independence was used on the collected survey data to test the first research hypothesis. While, two-way ANOVA was conducted to test the second research hypothesis.

This study found that on our sample of professionals in financial domain in Saudi Arabia, males and females do not significantly differ in their financial risk tolerance. In addition, the demographics, namely, age, education, marital status and income did not have a main effect on financial risk tolerance nor an interaction effect with gender to influence the level of financial risk tolerance. The implication of the study results, recommendation, and limitation along with a general conclusion will be covered in the fifth chapter.

5 IMPLICATIONS, RECOMMENDATION AND CONCLUSION

5.1 INTRODUCTION

The purpose of this study was to determine which of the demographic factors are connected to financial risk tolerance. The statistical analysis showed that on our sample, the demographics, namely, age, education, marital status and income did not have a main effect on financial risk tolerance nor an interaction effect with gender to influence the level of financial risk tolerance. In addition, it was found that males and females in our sample do not significantly differ in terms of their financial risk tolerance. In this chapter, implications and limitations of these results will be discussed.

The remainder of chapter 5 includes the implication of the results, limitation, and future work along with the general conclusion. The practical implications of the results was covered in the light of the findings of the study and the previous literature on the topic of financial risk tolerance and demographics. The results of the study could be limited by a number of manners represented in the second section. This section is followed by recommendations for future research regarding financial risk tolerance and the demographics. Finally, the general conclusion of the study is presented.

5.2 IMPLICATIONS

The results have future implications in the finance and business domain particularly, implications that will enhance the financial advisory industry and provides better understanding for different preferences in portfolio construction (Faff, Hallahan & McKenzie, 2011). The results are also helpful to the financial institutions and investment

companies to target the market more efficiently and design their products based on the different preferences and trends in the market. In the light of the results and the insignificant difference in attitude toward risk among the genders, the study comes to the implications of these findings.

Advisory industry and investment choices

The financial advisory industry is in crucial need to understand the factors that affect their clients' decision-making process. Since the results showed that demographic characteristics was not significantly connected to financial risk tolerance, relying primarily on the demographic factors to classify the investors into risk tolerance groups may not be suitable. Depending mainly on demographics may lead to failure in meeting the clients' financial goals and investment objectives (Grable & Lytton, 1998) specifically if the client had financial knowledge or expertise.

Training and education

The literature had shown the importance of the knowledge factor in affecting risk attitudes among genders, as well as the absence of gender differences among professionals in the financial domain (Adhikari & O'Leary, 2011; Kumar *et al.*, 2015 Martenson, 2008; Wong, 2011, among others). Thus, the educational attainment and the financial training may save risk averse investors from opportunities loss even if they did not have financial experiences. There is a need to design training programmers that guide individuals to understand risk assessment and management to be able to accept higher suitable risks to avoid sacrificing profitable opportunities. (Kumar *et al.*, 2015).

In summary, there is increasing research every year on the implications of the differences in risk attitudes among individuals (Palvia *et al.*, 2015). In this chapter, we discussed the implications of the study results on advisory industry and investment choices and Training and education.

5.3 LIMITATION

The main limitation of the study is the dynamic and complex nature of risk attitudes, as it is moderated by many factors. This complex nature reflects on contradicting results in the literature. It also requires the researchers to re-conduct this type of research continuously, as it is very sensitive to the rapid social and environmental changes (Wong, 2011). Secondly, the implications of these results are limited due to the sample selection of educated professionals with financial expertise. The sample of the study included only professionals in the financial domain, which restricts the ability of generalizing the results.

Moreover, the variables are self-reported by the respondents. This could lead to possible bias of the respondents into looking more or less risk tolerant than they really are. Thus, the responses were anonymized in order to mitigate this problem. In addition, a limitation of the self-reported variables is that it reflects the current situation of the respondent as well as their knowledge and perspective on the topic. Furthermore, examining only five demographic factors namely, gender, age, education, marital status and income on financial risk tolerance is a limitation of this study. Where other demographics are reported to be influencing the risk attitudes between individuals as occupation, self-employment and race (Grable & Lytton, 1998).

5.4 FUTURE WORK

Following work, comprise using another sample of students as proxy to potential investors with less financial knowledge to explore if the absence of financial knowledge will influence risk tolerance differences between genders. Assessing the differences in a population with less financial knowledge and experience in Saudi is recommended due to the changes in the Saudi Arabian society that include more chances for female investors, availability of financial education and the huge development in both investing and learning means.

Furthermore, studying the actual behavior in the Saudi financial market by assessing the differences in the level of portfolio volatility among genders is recommended, since such study will provide better understanding of the current level of risk in the Saudi financial market TDAWUL. It will also provide insights on the possibility of using gender diversity as a tool to influence the level of risk in the market. Gender diversity may be used as a tool to shift the level of risk in the Saudi stock market; whereas if female investors were found to be on average more risk averse they will consequently demand considerable less risky investments.

In addition, conducting more studies on other factors that may influence the risk tolerance level of the investors, whereas risk is a complex multidimensional output of many factors. Such moderators may include nationality, religion, economic ratios and general financial conditions.

5.5 CONCLUSION

The concept of risk tolerance represents an important element when shaping and developing financial strategies that meets households' financial goals. This concept is an essential input in nearly all financial decisions making processes. The literature showed opposing and conflicting results concerning gender-based differences in risk attitudes and the impact of demographics on risk tolerance level, thus this study will contribute to the debate in this area from a developing country perspective.

The problem explored in this study came from the lack of consensus of whether the demographic characteristics of the individuals, contributes to their personal level of financial risk tolerance. This quantitative study aimed to investigate if financial risk tolerance differs among genders. It also aimed to examine if the demographic variables namely, age, marital status, education and income interact with gender to determine difference in the risk preference.

The main result of this study is that the influence of gender on financial risk attitude appeared to be insignificant between professionals in Saudi Arabia. This study found that on our sample, males and females do not significantly differ in their financial risk tolerance. In addition, the demographic factors, namely, age, education, marital status and income did not have a main effect on financial risk tolerance nor an interaction effect with gender to influence the level of financial risk tolerance.

The non-significance of gender effect on financial risk tolerance among professionals in the financial domain in Saudi reflects the shared financial experiences and knowledge between the professionals in the financial sector. Financial knowledge in the literature is

suggested to subdue the gender gap in risk preferences (Hibbert *et al.*, 2013; Martenson, 2008). Adhikari & O'Leary in 2011, concluded that knowledge of the financial markets and products explained the risk aversion attitude more than the gender, and that gender-based differences were muted when financial knowledge was explaining the differences in financial risk tolerance. Moreover, having practical financial experience increases risk propensity that significantly influence the risk-taking behaviors. Risk propensity is defined as the cumulative tendency to take risks that is can be easily formulated early in an individual's career life (Sitkin & Weingart, 1995).

These results also indicates the complex nature of risk that goes beyond the influence of the demographic characteristics where it can be used only as starting point in assessing investors risk tolerance (Grable & Lytton, 1998). Moreover, risk tolerance consists of two parts: the first part is the ability to take risk where the personal demographic factors as age, income and education are present. The second part is the willingness to take risk where the psychological factors are present (Sweet, 2013). Thus, the personal demographic factors count only for a part of financial risk tolerance. In addition, more research is needed to determine which additional factors can be used by investment managers to explain variance in risk-tolerance (Grable, J., 1997). The main implications of this study is regarding the financial advisory industry, where relying primarily on the demographic factors to classify the investors into risk tolerance groups may not be suitable. Additionally, the importance of educational attainment and the financial training that may save risk averse investors from opportunity loss even if they did not have financial experiences. However, the results of the study are limited due to the sample selection that included only professionals in the financial domain, which restricts the ability of generalizing the results.

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Appendix

A. 13-item scale

1. In general, how would your best friend describe you as a risk taker?
 - a. A real gambler
 - b. Willing to take risks after completing adequate research
 - c. Cautious
 - d. A real risk avoider
2. You are on a TV game show and can choose one of the following. Which would you take?
 - a. \$1,000 in cash
 - b. A 50% chance at winning \$5,000
 - c. A 25% chance at winning \$10,000
 - d. A 5% chance at winning \$100,000
3. You have just finished saving for a “once-in-a-lifetime” vacation. Three weeks before you plan to leave, you lose your job. You would:
 - a. Cancel the vacation
 - b. Take a much more modest vacation
 - c. Go as scheduled, reasoning that you need the time to prepare for a job search
 - d. Extend your vacation, because this might be your last chance to go first-class
4. If you unexpectedly received \$20,000 to invest, what would you do?
 - a. Deposit it in a bank account, money market account, or an insured CD
 - b. Invest it in safe high quality bonds or bond mutual funds
 - c. Invest it in stocks or stock mutual funds
5. In terms of experience, how comfortable are you investing in stocks or stock mutual funds?
 - a. Not at all comfortable
 - b. Somewhat comfortable
 - c. Very comfortable
6. When you think of the word “risk” which of the following words comes to mind first?
 - a. Loss
 - b. Uncertainty
 - c. Opportunity
 - d. Thrill

7. Some experts are predicting prices of assets such as gold, jewels, collectibles, and real estate (hard assets) to increase in value; bond prices may fall, however, experts tend to agree that government bonds are relatively safe. Most of your investment assets are now in high interest government bonds. What would you do?

- a. Hold the bonds
- b. Sell the bonds, put half the proceeds into money market accounts, and the other half into hard assets
- c. Sell the bonds and put the total proceeds into hard assets
- d. Sell the bonds, put all the money into hard assets, and borrow additional money to buy more

8. Given the best and worst case returns of the four investment choices below, which would you prefer?

- a. \$200 gain best case; \$0 gain/loss worst case
- b. \$800 gain best case; \$200 loss worst case
- c. \$2,600 gain best case; \$800 loss worst case
- d. \$4,800 gain best case; \$2,400 loss worst case

9. In addition to whatever you own, you have been given \$1,000. You are now asked to choose between:

- a. A sure gain of \$500
- b. A 50% chance to gain \$1,000 and a 50% chance to gain nothing

10. In addition to whatever you own, you have been given \$2,000. You are now asked to choose between:

- a. A sure loss of \$500
- b. A 50% chance to lose \$1,000 and a 50% chance to lose nothing

11. Suppose a relative left you an inheritance of \$100,000, stipulating in the will that you invest ALL the money in ONE of the following choices. Which one would you select?

- a. A savings account or money market mutual fund
- b. A mutual fund that owns stocks and bonds
- c. A portfolio of 15 common stocks
- d. Commodities like gold, silver, and oil

12. If you had to invest \$20,000, which of the following investment choices would you find most appealing?

- a. 60% in low-risk investments 30% in medium-risk investments 10% in high-risk investments
- b. 30% in low-risk investments 40% in medium-risk investments 30% in high-risk investments

c. 10% in low-risk investments 40% in medium-risk investments 50% in high-risk investments

13. Your trusted friend and neighbor, an experienced geologist, is putting together a group of investors to

fund an exploratory gold mining venture. The venture could pay back 50 to 100 times the investment if successful. If the mine is a bust, the entire investment is worthless. Your friend estimates the chance of success is only 20%. If you had the money, how much would you invest?

- a. Nothing
- b. One month's salary
- c. Three month's salary
- d. Six month's salary

14. What is your gender?

- Male
- Female

15. What is your current age in years?

16. What is your marital status?

- Never married
- Married
- Separated
- Widowed

17. What is the highest level of education you have completed?

- Some high school or less.
- High school graduate.
- Some college/ vocational training.
- Bachelors degree.
- Graduate or professional degree.

18. What is your annual gross income?

- Less than 60,000 RS
- 61,000 – 120,000 RS
- 121,000 – 240,000 RS
- 241,000 – 480,000 RS
- More than 480,000 RS

19. Inter the name of your organization:

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The scoring for the risk-tolerance quiz questions is as follows:

1. a=4; b=3; c=2; d=1
2. a=1; b=2; c=3; d=4
3. a=1; b=2; c=3; d=4
4. a=1; b=2; c=3
5. a=1; b=2; c=3
6. a=1; b=2; c=3; d=4
7. a=1; b=2; c=3; d=4
8. a=1; b=2; c=3; d=4
9. a=1; b=3
10. a=1; b=3
11. a=1; b=2; c=3; d=4
12. a=1; b=2; c=3
13. a=1; b=2; c=3; d=4

Source: Grable, J., & Lytton, R. H. (1999b). Financial risk tolerance revisited the development of a risk assessment instrument☆. *Financial services review*, 8(3), 163-181.