CHAPTER 5

Determinants of Overall Risk-Taking and Financial Risk Tolerance: Experimental Evidence from Turkey

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1. Introduction

When individuals and households make economic or financial decisions such as taking a bank credit, establishing a new business, investing in a stock market, there are various factors that can affect those decisions. Overall risk-taking level and financial

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risk tolerance are among these factors. Risk-taking is an act that involves implementing options that can lead to negative results (Byrnes et al., 1999). In this sense, financial risk tolerance implies the maximum amount of uncertainty that a decision-maker is willing to accept for a financial decision (Grable, 2000). Since individuals' overall risk-taking level and financial risk tolerance can significantly affect the households' financial decisions, vast literature have been accumulated about risk-taking, financial risk tolerance, and their determinants. Besides academicians, financial intermediaries and policymakers have been concerned with overall risk-taking levels and financial risk tolerance at micro and macro levels, respectively. At the micro-level, financial intermediaries use the information about individuals' risk characteristics to develop appropriate financial products. Financial institutions and agents provide investment alternatives to individual investors according to their individual differences, thereby ensuring more funds for the financial system. At the macro level, policymakers can determine their country's economic planning to foster saving and investment behaviors by using the risk characteristics of the society (Dinç Aydemir & Aren, 2017).

In developing countries, household savings comprised the vast majority of total savings. Thus, exploring the factors that affect overall risk-taking levels and the financial risk tolerance of decision-makers is essential in determining the nature of household savings. In developing countries such as Turkey, mobilizing savings funds for long-term investment is vital for economic development. Since overall risk-taking level and financial risk tolerance are among the factors that affect the flow of savings to different investment areas, understanding these factors would help determine and implement the policies that will shift the savings to long-term investments (Copur & Gutter, 2019).

Just as the demographic and economic factors, individuals' risk-taking and risk tolerance levels are also dynamic phenomena and can change over time. With the help of changing demographic

and economic factors, individuals can shift their position on the risk-reward spectrum (Anbar & Eker, 2010). Moreover, the determinants of the overall risk-taking level and financial risk tolerance can change from country to country and region to region due to the subjective nature of the risk tolerance. While some researchers focus on purely psychological factors, some examine only demographic and socioeconomic factors to determine an individual's overall risk-taking level and financial risk tolerance (Grable, 2000).

Demographic parameters are among the most examined determinants of financial risk tolerance. Moreover, investment managers and researchers have almost a consensus that demographic characteristics of individuals can be used to differentiate them into risk-tolerance categories (Anbar & Eker, 2010; Grable, 2000). The existing literature shows that demographic factors such as gender, age, marital status, occupation, and income can affect individuals' risk-taking level and financial risk tolerance. Additionally, the effect of demographic factors can differ among countries due to different national cultures. For instance, in one culture, the dominant belief is that men should take greater risks than women, but in others, men may not be expected to take greater risks than women (Slovic, 1966). Therefore, it is crucial to examine the demographic determinants of the overall risk-taking level and financial risk tolerance for different countries.

The purpose of this study is to investigate the relationship between demographic characteristics and overall risk-taking levels, and financial risk tolerance. Using the microdata set of 15,041 respondents, we aim to examine the factors influencing individuals' overall risk-taking level and financial risk tolerance for Turkey. According to the authors' best knowledge, no study examines the determinants of risk-taking levels and financial risk tolerance using comprehensive data that represent the Turkish population as a whole. Some studies investigate these relationships employing the data obtained from university students only (Bayar

et al., 2020; Çankaya et al., 2013; Dinç Aydemir & Aren, 2017; Tütek et al., 2010). It would be safe to assume that studies with limited samples cannot represent the population of Turkey. Our study contributes to the literature in terms of using data that best represents the population of Turkey since our sample covers 89% of the total household populations of Turkey, and participants are the decision-makers in their households.

In the first part of the paper, we investigate the related literature and the studies done so far. The relevant literature has shown that our research is unique in terms of the representative power of our sample. The methodology of the study is stated in the second section. Data and empirical results are presented in the third section. The discussion and conclusion parts are the last parts of the study.

2. Literature Review

The decisions taken by investors in the market are affected by many parameters, and these investments are directly related to the overall risk-taking level and financial risk tolerance. S. Mishra and Mishra (2014) illustrate that numerous studies have investigated the effect of demographic and non-demographic parameters on risk tolerance. Some of these parameters are age, gender, marital status, ethnic background, educational level, number of dependents, income level, and wealth (Grable et al., 2019; Haliassos & Bertaut, 1995; Hallahan et al., 2004; Heo et al., 2020, 2021; Lippi & Rossi, 2020; Noviarini et al., 2021; Riley & Chow, 1992; Sung & Hanna, 1996).

Individuals' overall risk-taking levels are significant because it is a factor that determine the adaptiveness of human behavior and the rationality of human thought. Since overall risk-taking level can affect human decisions, the factor should be studied in the economic context. One of the factors generally mentioned related to risk tolerance is age (Brooks et al., 2018). Vroom and Pahl

(1971), in their study on a sample of 1484 managers, showed that there is a significant negative relationship between risk-taking and age. Moreover, Deakin et al. (2004) showed that older people tend to exhibit less risk-taking and risk adjustment with an experimental method. According to Rolison et al. (2014), while financial risk-taking decreases steeply, ethical and health-related risk-taking reduces smoothly in older age. Therefore, our first hypothesis is:

H_{1a}: There is a relationship between age and overall risk-taking level.

According to literature in psychology and sociology, it is generally accepted that while women are more risk-averse, men are more risk-tolerant. There are various questionnaire-based studies that confirm this common assumption (see Byrnes et al., 1999). In their experimental study, Charness & Gneezy (2012) find strong evidence that women are more risk-averse than men. Also, Niederle & Vesterlund (2007) stated that women tend to avoid competition compared to men. So, the hypothesis is:

H_{1b}: There is a relationship between gender and overall risk-taking level.

Studies have shown that risk preferences can change with education level. Education may influence how people think and decide and, therefore, can affect their behavior about risk-taking. It is assumed that because educated people are more likely to process complex information, they are more confident in risk-taking (Hambrick, 2007). For example, Lee & Moon (2016) showed that the education levels of CEOs, as well as their tenure, have a significant effect on their strategic risk-taking. On the other hand, Y. Wang et al. (2013) examined the relationship between education level and risk-taking with a sample consisting of Chinese managers and found that there is a negative relationship between these two variables. In line with the general view, the hypothesis is:

H_{1c}: There is a relationship between education level and overall risk-taking level.

Marital status may affect individuals' behavior directly or indirectly by creating a social control mechanism. Because of that, the married are less liable to be in risky situations such as accidents and assaults (Cheung, 1998). Because married individuals have greater social and economic responsibilities, they are less willing to be in risky situations and take risky actions that may harm the welfare of their families. So, our hypothesis is:

H_{1d}: There is a relationship between marital status and overall risk-taking level.

We also expect that there would be a relationship between overall risk-taking and individuals' ability to plan for the future. People who can predict the future and plan accordingly may be willing to take more risky actions. Therefore, it is expected that:

H_{1e}: There is a relationship between the level of planning for the future and overall risk-taking level.

It is well stated in the literature that demographic characteristics can affect financial tolerance as well as overall risk-taking. Age and gender are the first parameters that have been investigated among the demographic variables in relation to risk tolerance. Although the relationship between age and risk tolerance is not always linear, it is generally accepted that their financial risk tolerance decreases as people get older. The findings show that younger people are more tolerant of risk than older adults (Al-Ajmi, 2008; Bajtelsmit & Bernasek, 1997; Cardak & Martin, 2019; Faff et al., 2009; Fisher & Yao, 2017; Hartog et al., 2000; Nguyen et al., 2016; Pålsson, 1996). It is believed that because there is not much time for older people to recover from financial losses, they tend to choose to invest in less risky investments (Hallahan et al., 2004). On the other hand, some studies show a positive relationship between age and risk tolerance. For example, Wang & Hanna

(1998) examined the ratio of value of risky assets to total assets and found a positive relationship between financial risk tolerance and age. Also, according to Xiao & Anderson (1997), because wealth accumulates with age, the financial risk tolerance of older people is higher than that of young people. Lastly, some other studies find no relationship between age and financial risk tolerance (see Faff et al., 2009). For example, Van de Venter et al. (2012) examine the financial risk-taking level over an individual's life. The results show that financial risk-taking is unlikely to change substantially over the lifespan of an individual. As a result, in line with the generally accepted view, the hypothesis is:

H_{2a}: There is a relationship between age and financial risk tolerance.

Gender is another factor that has a relationship with financial tolerance. There are many studies that show that men and women react differently to risky situations. The literature generally suggests that men are more risk-tolerant than women (Bernasek & Shwiff, 2001; Brooks et al., 2019; Lawrenson & Dickason-Koekemoer, 2020; Lemaster & Strough, 2014; Powell & Ansic, 1997). For example, Barber & Odean (2001) show that because men feel more confident, they trade more actively in stock exchange. Also, gender differences in financial risk tolerance are investigated in Fisher & Yao's (2017) research. The findings demonstrate that income uncertainty is negatively related to high-risk tolerance for women but positively affects men. Moreover, net worth has a significantly positive association with high-risk tolerance for men. On the other hand, Hibbert et al. (2013) analyze the direct investments of academics in the field of finance, and according to their results, gender has no effect on risk aversion for highly educated people. Çankaya et al. (2013) found that women students to be more risk-averse than men. So, according to the prevailing view, the hypothesis is:

H_{2b}: There is a relationship between gender and financial risk tolerance.

Marital status also is a crucial parameter to explain financial risk tolerance. The literature suggests that single people are more risk-tolerant compared to married ones (Hallahan et al., 2004). Because single individuals do not have as many financial responsibilities as married people, it has been determined that single individuals are more tolerant than married people toward financial risk (Barber & Odean, 2001; Fan & Xiao, 2005; Yao et al., 2004). The higher level of social and financial responsibilities accompanying marriage and dependents could be the reason behind their low risk tolerance. However, some studies show married individuals can be more risk-tolerant. For example, according to Watson & McNaughton (2007), because there is a second income for the household, marriage might promote investments in riskier assets. Lastly, some studies that find no relationship between marital status and risk tolerance (Haliassos & Bertaut, 1995). Therefore, it is expected that:

H_{2c}: There is a relationship between marital status and financial risk tolerance.

There are also some studies examining the relationship between education level and financial risk perception. These studies indicate a positive relationship between education level and financial risk perception. Higher education encourages individuals to invest their money in risky financial instruments (Baker & Haslem, 1974; Bellante & Green, 2004; Shaw, 1996; Sultana & Saradhi, 2011). Duasa and Yusof (2013) shed new light on the issue of determinants of risk tolerance among Malaysians. The results show that risk tolerance is higher among younger people, males, those with a higher level of education, and those in the non-public sector. So, the related hypothesis is:

H_{2d}: There is a relationship between education level and financial risk tolerance.

Another variable discussed in the study is the level of individuals' ability to plan for the future. Here, it is expected that those decision-makers with a high level of ability to plan for the future would be more risk-tolerant. No previous study on the subject has been found in the literature. In this respect, the effect of this variable is thought to be a significant contribution to the literature. The hypothesis is:

H_{2e}: There is a relationship between the level of planning for the future and financial risk tolerance.

The effect of demographic characteristics on the financial risk tolerance of the individuals in Turkey is examined by Bayar et al. (2020) with a study employing a multinomial logistic regression analysis for 1348 respondents. The results demonstrate that demographic parameters of age, gender, education, and income level significantly affect financial risk tolerance. There is a negative relationship between age and risk tolerance as older adults undergo time restrictions to dispose of possible financial losses. In addition, Anbar & Eker (2010) examine the association between financial risk tolerance and demographic parameters for 1,100 university students in Turkey. The findings show that although age, marital status, and the number of children had no significant effect on financial risk tolerance, gender, income, and total net assets have a significant effect in differentiating individuals' risk tolerance. Table 1 demonstrate that the related factors of financial risk tolerance (Grable, 2008).

Table 1: Factors related to financial risk tolerance

Individual characteristic	More Risk-Tolerant	The level of supporting literature
Gender	Male	High
Age	Younger	Moderate
Marital status	Single	Moderate
Marital/gender interaction	Single male	High
Education	Bachelor's degree or higher	Moderate

Note: 80%-100%, 50%-79%, and 0%-49% indicate the level of high, moderate, and low supporting literature, respectively. Grable (2008) reviewed 125 studies which are published between 1960 and 2006.

3. Data and Methodology

3.1. Data

The microdata set was obtained from the Turkey Household Financial Perception and Attitude Survey, conducted by the Finance Office of Presidency of the Republic of Turkey. The dataset comprises 49 urban and rural provinces representing NUTS 1 (Nomenclature of Territorial Units for Statistics) level covering Turkey. These provinces cover 89% of the total population of households and 92% of GDP. The study was carried out by interviewing 15,041 individuals who are decision-makers or partners in financial matters in selected families (The Finance Office of Presidency of the Republic of Turkey, 2020). The survey aims to measure the financial perceptions and attitudes of the Turkish people.

3.2. Methodology

The study aims to explain the overall risk-taking and financial risk tolerance of Turkish people with demographic variables using

the data from the survey conducted by the Finance Office of the Presidency of the Republic of Turkey. Gender, education level, marital status, and age are demographic variables considered as explanatory variables of the study. Moreover, individuals' ability to plan for the future was also included in the analysis as another independent variable. In the survey, this variable was asked as "For how long can you make your future plans for your savings, excluding real estate?".

On the other hand, the variable of the overall risk-taking level was asked as "Do you generally consider yourself as a risk-taking person or a risk-averse person?". The answers for the question range from 1 to 10 (1: not willing to take any risk; 10: entirely willing for risk).

Additionally, an experimental question was asked to determine the financial risk tolerance of individuals: "Assume that you have five different investment options for a one-year period where the probability of winning or losing is equal. If you have an extra 100,000 TL, which of the offers would you choose?" Then they were asked to choose one of the options in Figure 1:

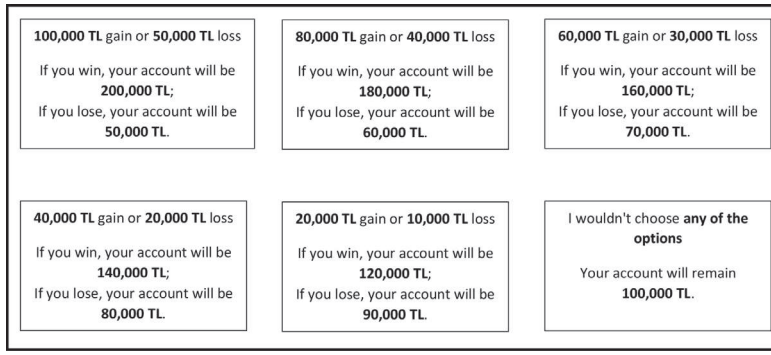

Figure 1: Options for financial risk tolerance question

4. Results

The number of people according to demographic variables and their percentage are indicated in Table 2. Table 2 also shows the mean and standard deviation values of explanatory variables examined within the scope of the study according to the overall risk-taking and financial risk tolerances.

Table 2: Explanatory Variables in Relation to Overall Risk-Taking Level and Financial Risk Tolerance

				Overall Risk-Taking		Financial Risk Tolerance	
		N	%	Mean	Std. Dev.	Mean	Std. Dev.
Gender	Female	6417	42.7	4.67	2.476	2.29	1.620
	Male	8624	57.3	5.01	2.355	2.53	1.710
Education	Primary	4708	31.3	4.53	2.484	2.17	1.574
	Secondary	7011	46.6	5.05	2.356	2.54	1.701
	University/Post Graduate	3318	22.1	4.97	2.377	2.56	1.720
Marital Status	Married	8415	56.0	4.52	2.471	2.26	1.656
	Single	6622	44.0	5.31	2.262	2.63	1.678
Future Planning	None	2648	18.9	4.79	2.524	2.09	1.597
	Less than 6 months	1951	13.9	4.60	2.332	2.14	1.359
	6 months – 1 year	1835	13.1	4.95	2.289	2.45	1.533
	1-2 years	2496	17.8	5.00	2.417	2.49	1.667
	2-5 years	2626	18.7	4.94	2.328	2.69	1.781
	More than 5 years	2474	17.6	5.07	2.252	2.74	1.801

Table 3 shows the correlation coefficients indicating the linear relationships between age, the overall risk-taking level, and financial risk tolerance.

Table 3: Correlations

	Age	Overall Risk-Taking	Financial Risk Tolerance
Age	1	-0.186*	-0.179*
Overall Risk-Taking		1	0.399*
Financial Risk-Taking			1

* Significant at 0.01 level

There is a weak but significant negative relationship between age and both overall risk-taking and financial risk tolerance levels. Therefore, it can be said that as age increases, both overall risk-taking and financial risk tolerances decrease. In addition, there is a moderate positive relationship between overall risk-taking and financial risk tolerance. In other words, the higher the overall risk-taking level of individuals, the higher their level of financial risk tolerance.

Table 4: Univariate Overall Linear Model Analysis (Overall Risk-Taking)

	F	Sig.
Corrected Model	51.914***	0.000
Intercept	7005.393***	0.000
Gender	80.077***	0.000
Education	0.600	0.549
Marital Status	90.670***	0.000
Future Planning	18.739***	0.000
Age	159.817***	0.000
Gender*Education	11.235***	0.000
Marital Status*Gender	0.167	0.683
Marital Status*Education	12.866***	0.000

* Significant at 0.05 level, ** Significant at 0.01 level, ***Significant at 0.001 level;

$R^2 = 0.053$; Adj. $R^2 = 0.052$

The results obtained from the analysis are shown in Table 4. As a result of the analysis, it was seen that gender, marital status, level of planning for the future, and age affect the overall risk-taking levels of individuals. So, according to the results, hypotheses of H_{1a}, H_{1b}, H_{1d}, and H_{1e} were accepted. However, the results showed that there is no significant relationship between education level and overall risk-taking level. Therefore, the H_{1c} hypothesis was rejected. By examining means of sub-groups, it can be seen that the overall risk-taking level of men, singles, young people, and people who can plan ahead is higher. The model explains approximately 5.2% of the variance in the overall risk-taking level.

On the other hand, it was seen in the Figure 2 that gender affects the relationship between education level and overall risk-

taking level. By examining the relationship, it can be seen that the group with the highest level of risk-taking among women is high school-graduated women. In contrast, for men, the risk-taking levels of high school graduates are the lowest.

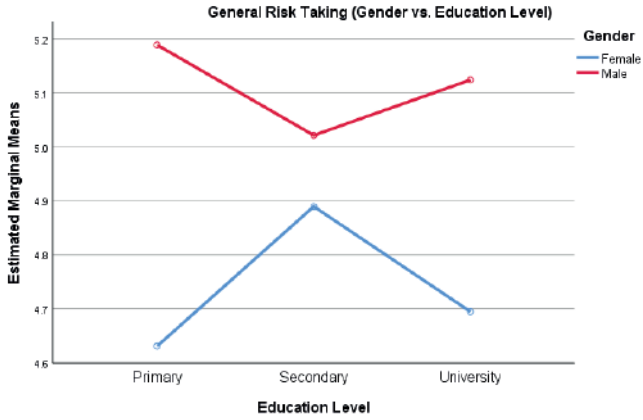

Figure 2: Overall Risk-Taking Level (Gender/Education Level)

However, marital status had no effect on the relationship between gender and overall risk-taking level. As in Figure 3, marital status does not affect the relationship between gender and overall risk-taking level.

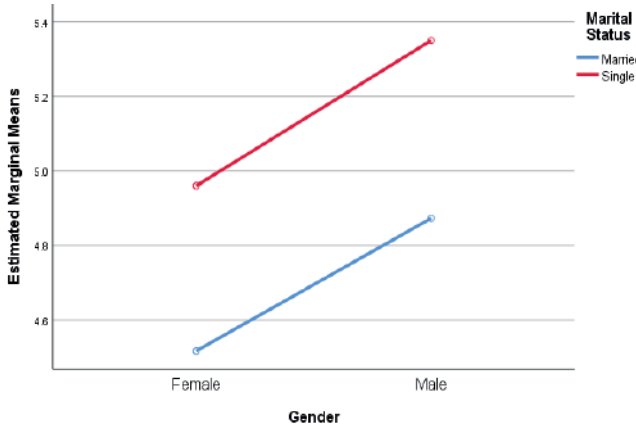

Figure 3: Overall Risk-Taking Level (Marital Status/Gender)

In addition, marital status affects the relationship between education level and overall risk-taking level. According to Figure 4, the risk-taking level tends to increase as the education level increases for married people, while it tends to decrease for single people.

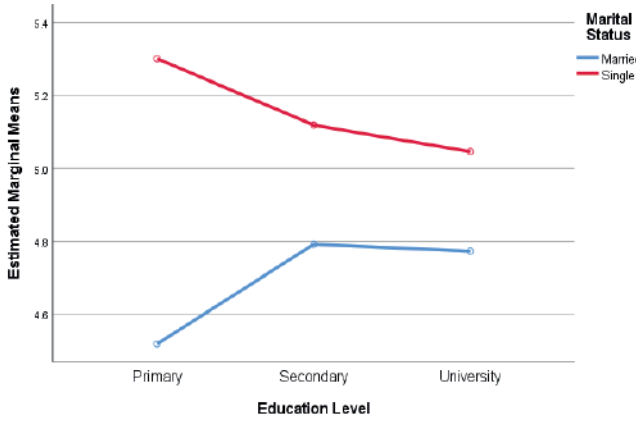

Figure 4: Overall Risk-Taking Level (Marital Status/Education Level)

Table 5: Univariate Overall Linear Model Analysis (Financial Risk Tolerance)

	F	Sig.
Corrected Model	61.264***	0.000
Intercept	4149.307***	0.000
Gender	79.601***	0.000
Education	6.580**	0.001
Marital Status	8.540**	0.003
Future Planning	67.085**	0.000
Age	206.737**	0.000
Gender*Education	1.503	0.223
Marital Status*Gender	2.976	0.085
Marital Status*Education	3.443*	0.032

* Significant at 0.05 level, ** Significant at 0.01 level, ***Significant at 0.001 level;

$R^2 = 0.062$; Adj. $R^2 = 0.061$

The results of the analysis are shown in Table 5. As a result of the analysis, it was seen that gender, marital status, education level, future planning level, and age were effective on the financial risk tolerance. So, hypotheses of H_{2a}, H_{2b}, H_{2c}, $H_{2d,}$ and H_{2e} were accepted. According to the group means, men's financial risk tolerance is higher while the financial risk tolerances of primary school graduates are lower compared to other education groups. Moreover, the financial risk tolerance of singles is higher than that of married people. In addition, the financial risk tolerance of those who can plan for the future is higher than that of those who cannot. Finally, there is a low-level negative relationship between age and financial risk tolerance. The model explains approximately 6.1% of the variance in the financial risk tolerance.

On the other hand, it was seen that gender did not affect the relationship between education level and financial risk-taking.

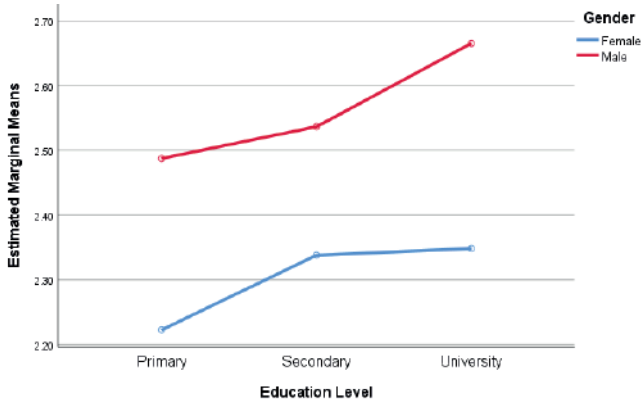

Figure 5: Financial Risk tolerance (Gender/Education Level)

In addition, the analysis shows that marital status does not affect the relationship between gender and level of financial risk-taking (Figure 6).

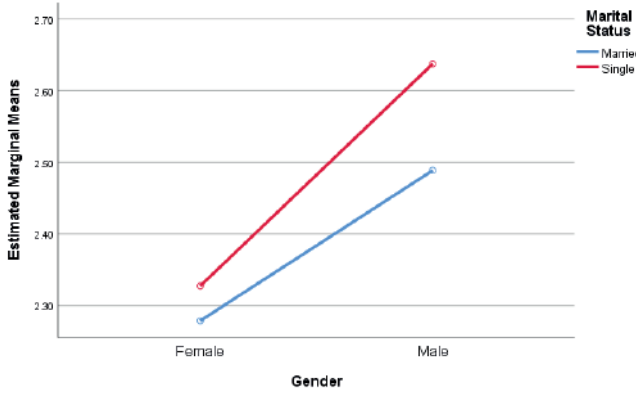

Figure 6: Financial Risk tolerance (Marital Status/Gender)

However, marital status does have an impact on the relationship between education level and financial risk tolerance. When Figure 7 is examined, it is seen that for married people, as the level of education increases, the financial risk tolerance increases more than singles.

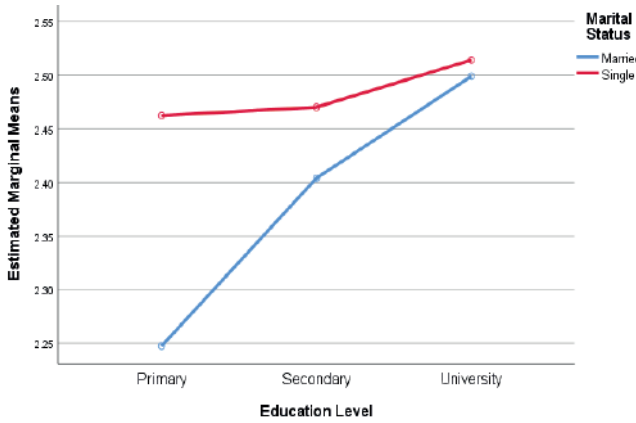

Figure 7: Financial Risk tolerance (Marital Status/Education Level)

5. Discussion and Conclusion

This study aims to investigate the relationship between demographic characteristics and overall risk-taking level, and financial risk tolerance. Using the microdata of 15,041 respondents, this study examines the factors influence the level of individuals' financial risk tolerance for Turkey. The findings demonstrate that while gender, marital status, level of planning for the future, and age affect individuals' overall risk-taking levels and financial risk tolerance, education only affects financial tolerance. There is a weak but significant negative relationship between age and both overall risk-taking and financial risk tolerance. Therefore, it can be said that as age increases, both overall risk-taking and financial risk tolerance decrease. Our results confirm the results in the literature

(Al-Ajmi, 2008; Bajtelsmit & Bernasek, 1997; Faff et al., 2009; Fisher & Yao, 2017; Hartog et al., 2000; Nguyen et al., 2016; Pålsson, 1996).

We detected that single individuals are more tolerant than married people toward financial risk. These results are in line with the result of Barber & Odean (2001), Fan & Xiao (2005), and Fisher & Yao (2017). Also, the results of studies by Nguyen et al. (2016), Anbar & Eker (2010), and M. Mishra & Mishra (2016) confirm that men's financial risk tolerance is higher, while the financial risk tolerances of primary school graduates are lower compared to other education groups. In addition, as expected, there is a moderate positive relationship between the overall risk-taking and the financial risk tolerance. In other words, the higher the overall risk-taking level of individuals, the higher their level of financial risk tolerance.

Overall, the results of the study are substantially consistent with existing literature. Turkish men's financial risk tolerance is higher than women's. Moreover, the financial risk tolerance of singles is higher than that of married people. These two findings are highly related to Turkish family structure since the father usually takes the economic and financial decisions in Turkish family culture. As Fisek (1991) stated, most families are nuclear families with a working father and a stay-at-home mother. Traditional and patriarchal authoritarian norms are still strong in Turkish families. These patriarchal authoritarian norms lead to financial decisions and risks taken by the father in the family.

As a consequence of this situation, married people take lower risks because they are responsible for looking after other family members. In contrast, single people can take more financial risks because their financial decisions are unlikely to affect many people. However, married people's risky decisions can jeopardize their family's livelihood.

Our findings demonstrate that low educated people have lower risk tolerances, whereas high educated people have higher. This finding can be related to the level of financial literacy. As Bajo et al. (2015) stated, low educated people have lower financial literacy. Since they have less information about financial instruments, they may not invest in capital market instruments, such as stocks and equity funds. On the other hand, our findings show that younger people take more financial risks than older people. In other words, as age increases, the level of financial risk-taking decreases. Although some studies (Grable & Lytton, 1998; Jianakoplos & Bernasek, 2006) suggest that age is not a significant factor for risk tolerance, it has been widely assumed that older people tend to have lower risk tolerances than younger people. The reason behind this assumption is that older people have less time to recoup their financial losses than do younger people. Our findings confirm the common heuristic belief that younger people take more financial risks than older do. Moreover, as some studies suggest, it can be derived from biological changes in enzymes due to the aging process. Both results related to age and education have significant implications for stock markets and financial management.

The study has significant results for financial intermediaries and policymakers. Financial intermediaries use these findings to develop appropriate financial products. For example, they can develop risky financial products for young, male, and high-educated people but low-risk products for old, low educated people or women. Using these findings, financial intermediaries can contribute to ensuring more funds to the financial system. Moreover, the findings can be beneficial for policymakers in terms of developing policies to foster saving and investment. Turkey currently tries to improve its capital market and develop new capital market instruments. To improve its capital market, policymakers should encourage people who would stay away from capital markets as they think it is risky to invest. For this purpose, they should focus on married, old, and low-educated people in their policies.

It can be noted that this study involves some limitations. First, the study used cross-sectional data to examine the factors influence the individuals' overall risk-taking and financial risk tolerance level. Cross-sectional data give us the results at a specific point in time. However, longitudinal data gives better results in detecting the determinants of financial risk tolerance. In other words, collecting data by monitoring and observing people over a period of time leads to more valid results. Second, the questions in the questionnaire are not explicitly designed for this study, and therefore their representation of variables is not somehow perfect. Also, this study used a limited number of variables such as age, gender, education, marital status, and future planning. There are some other important variables that can affect risk tolerance, such as income and wealth. So, in future studies, researchers can add other parameters such as income, religion, and living area (rural-urban) and include more appropriate questions to measure determinants of risk tolerance.

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