Behavioral Investor Types- Determinants of Individual Investors' Financial Risk Tolerance[*]

Çiydem ÇATAK[**]
Sena YILMAZ ARSLAN[***]

ABSTRACT

Financial risk tolerance has long been the focus of investors and researchers. Over time, various methods have been developed to measure risk tolerance and researchers try to find out the determinants of risk tolerance. The objective of this study is to identify the impact of socioeconomic as well as demographic variables on investors' risk-taking behavior and to classify investors into behavioral investor types. Therefore, a questionnaire that measures risk tolerance in two ways is conducted. Risk tolerance is measured with the active or passive characteristic traits quiz and a classical risk-tolerance questionnaire. Firstly, the results of the Multiple linear regression show that the variables gender and education are factors that significantly determine risk tolerance. Secondly, the behavioral investor types analysis shows that investors are not very emotional in their investment behavior and have predominantly cognitive biases.

Keywords: *Financial Risk Tolerance, Individual Investor Behaviors, Demographic and Socioeconomic Factors*

JEL Classification: *G11, G40, G41*

Davranışsal Yatırımcı Türleri- Bireysel Yatırımcıların Finansal Risk Toleransını Belirleyici Faktörler

ÖZET

Finansal risk toleransı, uzun zamandır yatırımcıların ve araştırmacıların odak noktası olmuştur. Zamanla, bireysel yatırımcıların risk toleransını ölçmek için çeşitli yöntemler geliştirilmiştir ve araştırmacılar risk toleransının belirleyici faktörlerini bulmaya çalışmaktadır. Bu çalışmanın amacı demografik ve sosyoekonomik faktörlerin yatırımcıların risk alma davranışları üzerindeki etkisini belirlemek ve yatırımcıları davranışsal yatırımcı tiplerine ayırmaktır. Bunun için risk toleransını iki şekilde ölçen bir anket kullanılmıştır. Risk toleransı, aktif veya pasif karakteristik özellikler testi ve klasik bir risk toleransı anketi ile ölçülmüştür. İlk olarak, çoklu doğrusal regresyon sonuçları, cinsiyet ve eğitim değişkenlerinin risk toleransını önemli ölçüde belirleyici faktörler olduğunu göstermektedir. İkinci olarak, davranışsal yatırımcı tipleri analizi ile yatırımcıların yatırım davranışlarında çok duygusal olmadıkları ve ağırlıklı olarak bilişsel önyargılara sahip oldukları tespit edilmiştir.

Anahtar Kelimeler: *Finansal Risk Toleransı, Bireysel Yatırımcı Davranışları, Demografik ve Sosyoekonomik Faktörler*

JEL Sınıflandırması: *G11, G40, G41*

1. INTRODUCTION

Two factors in the particular matter when it comes to investing money: the return the investor hopes to obtain and the level of risk they are ready to face. In this context, return means the expected profit on the invested capital. It is an indicator for the investor to check how successful his investments have been over time. Risk, on the other hand, is the fluctuation in the expected return associated with that particular investment. "The higher the return, the higher the risk" is probably the best-known principle in the financial world, and it is also well-known that things get a bit more complicated when fluctuations are added. The complicated investment decisions cause people to seek financial advice. To provide successful financial advice, financial advisors first try to determine the investor's financial risk profile and risk tolerance.

Financial risk tolerance, which is referred to as the level of volatility that an investor is ready to take in financial concerns, is an important concept to understand while making financial decisions. The understanding of the investor's personal risk tolerance is essential for the investor himself and also their financial advisors in order to form the best suitable investment portfolio as risk tolerance is an important factor in understanding cognitive ad emotional biases (Kahneman and Riepe, 1998: 52-65). In the past, clients were typically asked to rate their appetite for risk on a scale ranging from strongly risk-averse to strongly risk-tolerant, or attempts were made to determine clients' risk tolerance with some basic questions. Nowadays, especially with the introduction of robo-advisors into our lives, the concept of measuring individual risk tolerance has become particularly popular and it is suggested that risk tolerance should preferably be measured using several different methods. Financial institutions are starting, usually with some detailed surveys or with case-based events or visualized questions, to ascertain their customers' risk tolerance and apply it to the consulting process. Furthermore, this topic is not just relevant in the practice but is also a widely researched topic in the behavioral finance literature.

Many studies have been conducted to determine the factors that influence risk tolerance using various demographic and socioeconomic factors. Nevertheless, there is no consensus on which variables are significant in determining individual risk tolerance and also in which direction the different variables influence risk tolerance. This study aims to contribute to the research of the risk tolerance's determinants, especially for the case of Turkey, on which little research is conducted. Besides we categorize the participants into investor types which can be useful in the identification of biases in advance.

For this study, an online questionnaire is conducted on 129 respondents from Turkey and Germany. The questionnaire contains questions regarding the demographic and socioeconomic information of the investors. Further, financial knowledge and risk tolerance is measured. Risk tolerance is measured in two ways; first with the active or passive characteristic traits questions of Pompian (2012) and second with a classical risk-tolerance questionnaire. The influence of the demographic and socioeconomic variables on the risk tolerance measured by the active/passive traits is tested with the purpose to find out the variables affecting risk tolerance. The findings indicate that risk tolerance is significantly influenced by the parameters of gender and education. Yet, it is discovered that factors including age, marital status, employment, monthly wage, financial knowledge, education, and culture have no discernible impact on risk tolerance. In a second step, Pompian's Behavioral Investor Types framework is conducted to categorize the participants into the four Behavioral Investor Types; Preserver,

Follower, Independent, and Accumulator. This categorization aims to facilitate appropriate financial advice and identify possible biases in advance. The findings indicate that the bulk of the respondents are "Followers" and "Independent". Those two types are on the medium risk-tolerance scale and have less emotional investment behavior. They are prone mostly to cognitive biases.

The remainder of this paper is as follows. In the second section, a literature review is given. In the third section, the research methodology and design are described. The fourth section contains the results. Finally, in the fifth section, a brief discussion and conclusion are given.

2. LITERATURE REVIEW

Halek and Eisenhauer (2001) estimate in their study a risk aversion parameter with the Pratt-Arrow measure using survey data used for life insurance purchases including 2.300 individuals. They examine among others the impact of the variables age, gender, education marital status, employment status, income, and wealth on risk aversion. The findings demonstrate that risk aversion declines with age and with rising human capital and that risk aversion increase with marriage, self-employment, and increasing assets. Furthermore, women are more risk-averse. Unemployment or education does not affect risk aversion. In a second step, the authors analyze the speculative risk of the individuals. They find that the risk-takers in the speculative risk question have a low level of risk aversion.

In their article "An empirical investigation of personal financial risk tolerance" Hallahan et al. (2004) examine the connection between demographic data and risk attitude. The data is obtained from a database containing risk tolerance scores of 20.000 individuals obtained through a risk tolerance survey. The influence of demographic variables on risk tolerance is assessed with a hierarchical regression analysis. Their findings demonstrate that the risk tolerance score is significantly influenced by factors such as wealth, income, and gender. Women have in general a lower risk tolerance score and with increasing income and wealth the risk tolerance score increases. Age and marital status have a negative impact on risk appetite.

Grable and Joo (2004) conduct a study on 460 faculty and staff members of two universities with the aim of expanding the literature on the determinants of financial risk tolerance. The outcomes of the multiple regression demonstrate that risk tolerance is significantly influenced by education, marital status, wealth, income, financial literacy, and self-esteem.

Plott and Smith (2008) review the results of experimental studies measuring the risk tolerance differences between women and men. Their review shows that most studies conclude that women are more risk-averse. But the authors argue that there is a need for further research because there is also a bulk of studies with counter-evidence. They also argue that the lack of comparability across studies and the inconsistency of measures of risk aversion lead to difficulties to conclude that women are generally less risk-taking than males.

In their paper, Anbar and Eker (2010) examine the relationship between demographic information and risk tolerance based on the results of a survey from 1097 students in Turkey. According to their findings, men have a substantially higher risk tolerance than women, and

working students and students with a higher income have a significantly higher risk tolerance score. They discovered that the risk tolerance score is not significantly impacted by years of age, marital status, or the number of children.

Dohmen et al. (2011) analyze the results of a risk attitude survey from a database of 22.000 individuals representative of the adult population in Germany. Their results show that gender, age, height, income, wealth, and parental education affect the willingness to take risk significantly positive, whereas bad health status, unemployment, and the number of children negatively affect the willingness to take risk. In a second step, the authors performed a field experiment with the subjects taking part in a risk survey and lottery experiments. The results of the field experiment document the validity and robustness of the first analysis and prove that a risk attitude survey is a reliable risk tolerance measurement methodology. Furthermore, the authors analyze the risk attitude in several non-financial contexts showing that risk attitudes are similar in different contexts with the own subjective ranking of the general risk level being the best predictor for the overall risk attitude.

Thirty-one individual investors from the Istanbul Stock Exchange were studied over the period of 2007–2009 by Saraç and Kahyolu (2011) to determine the impact of socioeconomic and demographic factors on their risk-taking behavior. The authors generate a risk-taking score for each investor base on the investment sum in stocks, the standard deviation of the stocks, and the average portfolio value. According to their findings, retirees have a higher risk tolerance than workers, older investors have a higher risk tolerance than younger investors, female investors have a lower risk tolerance, investors with a high school education have a lower risk tolerance than investors with undergraduate and graduate degrees, whereas investors with a graduate degree have a lower risk tolerance than investors with an undergraduate degree. Furthermore, the relationship between monthly income level and risk tolerance is differing among different income groups.

3. DATA AND METHODOLOGY

The data used in the empirical part of this study is collected using an online survey. The conducted questionnaire consists of four main parts. The questions in the first section pertain to the investors' demographic data. The second part asks about the investors' financial knowledge. The third part of the questionnaire deals with the active or passive characteristic traits of the investors. Finally, the fourth part measures the risk tolerance of participants.

The sample consists of a total of 129 people from Turkey and Germany. Among the participants, 72 were men and 57 were women between the ages of 18 and 49. 75 of the participants are married and 105 participants work full-time with a salary.

Firstly, participants' financial knowledge is determined by 5 basic financial questions, listed below and taken from Sejdiji's (2017) study:

"Suppose there is €100 in your account, which earns interest at 2 percent per year. How much money will you have in the account after 5 years if you do not withdraw any money until then?"

"You have a savings account that earns interest at 1% per year. The annual inflation is 2%. After one year, with the money in the savings account, I can..."

"Is the following statement true or false? "An investment in a single stock is generally safer than an investment in a stock fund."

"What does the Beta factor indicate?"

"What does Arbitrage mean?"

The correct and incorrect answers to these questions are evaluated and the participants who answer 3 or more questions correctly are rated as high financial knowledge. The participants with 2 correct answers are evaluated as medium financial knowledge and the participants who have 1 correct answer or do not have any correct answer are evaluated as low financial knowledge. Besides, the educational level of participants is also high, with 43 participants having completed or in the process of completing a master's degree or Ph.D. 8.53 percent of respondents live in Germany, but the majority live in Turkey.

Secondly, the eight aspects of age, gender, occupation, marital status, monthly salary, financial knowledge, education, and culture are examined in relation to active/passive traits. To determine active or passive characteristics of investors, Pompian's (2012) active/passive traits quiz is used. With the aid of this procedure, an effort is made to ascertain whether the investor has ever risked money in the past or present in order to accumulate wealth. A ten-question test is used to examine the active/passive nature of the investor. The evaluation of the questions is based on the options chosen. The majority of "a" responses denote an active investor, whereas the majority of "b" responses denote a passive investor. The goal is to determine where the investor falls on the risk spectrum in relation to the "active/passive" scale categorization. In the risk questionnaire, it is expected that passive investors are rated as medium to low, whilst active investors are rated as medium to high. Figure 1 depicts the expected risk tolerance and active/passive reactions. Individuals with a risk tolerance of 1 are classified as having a low-risk tolerance, which are the passives, and individuals with a risk tolerance of 3 are classified as having a high-risk tolerance, which are the actives.

Figure 1. Active/ Passive Tratis

1	2	3
Low-Risk Tolerance ⬅	Medium-Risk Tolerance	➡ High-Risk Tolerance
Passive Traits		Active Traits
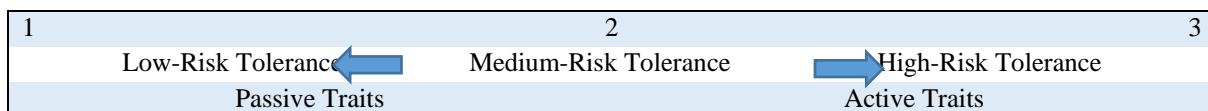
Source: Pompian (2012)

After classifying respondents as active and passive, by evaluating demographic and socioeconomic data, the study aims to identify the factors that impact financial risk tolerance. The active/passive categorization is used to create the following hypothesis regarding the factors that determine risk tolerance. Exploratory data analysis is used to examine the distribution of demographic, and socioeconomic characteristics within risk tolerance levels. It is also used to assess the normality of the variables. For all scales, the skewness and kurtosis statistics were between -2 and +2 intervals, indicating that the data were normally distributed (West et al.,1995).

Table 1. Demographic and Socioeconomic Characteristics and Risk Tolerance

	Mean	Kurtosis- Skewness
Age		
18-29	2,0000	-1,220 - 0,000
30-39	1,7200	-0,953 - 0,493
40-49	2,0909	-1,437 - -0,175
Gender		
Male	2,2083	-1,125 - -0,364
Female	1,5263	-0,473 - 0,664
Employment		
Full time	1,9048	-1,211 - 0,160
Working in your own company	2,0833	-1,261 - -0,161
Unemployed	1,7500	-1,446 - 0,567
Marital Status		
Single	1,8704	-1,296 - 0,233
Married	1,9333	-1,238 - 0,113
Monthly Salary		
4000 and below	2,0625	-1,412 - -0,116
4000-8000	1,7313	-0,982 - 0,467
8000 and above	2,1333	-1,019 - -0,214
Financial Knowledge		
Low	1,7500	-0,907 - 0,418
Medium	1,9048	-0,112 - 0,056
High	1,9737	-1,496 - 0,049
Education		
Primary school	2,1429	-1,635 - -0,306
High school	2,3333	-0,300 - -0,857
University	1,9545	-1,097 - 0,071
Master	1,7353	-1,032 - 0,487
PhD	1,5556	0,185 - 1,014
Culture		
Turkey	1,8898	-1,238 - 0,188
Germany	2,0909	-1,485 - -0,190

The first demographic variable we analyze is age. Our results show that there are different risk-tolerance levels for different age groups. The age group 18 to 29 has a medium-risk tolerance, the age group 30 to 39 has a risk tolerance level on the low-risk scale and the age group 40 to 49 has a risk tolerance level slightly on the high-risk scale. The bulk of research' findings in the literature indicate that risk tolerance rises with age (Wang and Hanna, 1997: 27-31; Grable, 2000: 628; Halek and Eisenhauer, 2001: 20). But some studies stipulate a negative relationship (Hallahan et al., 2004: 68). Our results comply partly with the literature as our results suggest that age and risk tolerance do not correlate linearly, with risk tolerance decreasing from the age group 18-29 to 30-39.

The second variable is gender. Gender is one of the most examined variables in the literature. Women are often found to be less risk-tolerant in the literature (Yao and Hanna, 2005: 71; Anbar and Eker, 2010: 513; Hallahan et al., 2004:68; Dohmen et al., 2011: 530; Grable, 2000: 628; Plott and Smith, 2008; Fisher and Yao, 2017: 197). In line with the literature, our results display that women are on the low-risk tolerance scale and men are on the high-risk tolerance scale.

The investigation of the employment variable indicates that full-time employed investors are more risk-tolerant (1,9) than unemployed participants (1,75). Further self-employed investors are the most risk-tolerant with a mean of 2,09, which is a score on the high-risk tolerance scale. In the literature, it is stipulated that unemployment has a negative impact on risk tolerance (Dohmen et al. (2011:540) or complementary that occupational status has a positive impact on risk tolerance (Grable, 2000: 628). Besides some research also show that self-employment rises risk tolerance (Sung and Hanna, 1996: 15; Antonites and Wordsworth, 2009: 82) which could be due to the fact that self-employment is risky per se and is therefore also used as a risk measure itself (Dohmen et al., 2011: 525).

The fourth variable we examine is marital status. Our findings suggest that married investors are marginally more risk-tolerant. This result is contrary to the common literature. In the literature, it is agreed that marital status has a negative effect on risk tolerance (Hallahan et al., 2004: 68; Grable and Joo, 2004: 82; Halek and Eisenhauer, 2001: 20; Yao and Hanna, 2005: 71). Yet studies also suggest that married investors are more risk-tolerant compared to single investors (Grable, 2000: 628).

Further we investigate the influence of monthly salary on investors' investment behavior. Investors with a high monthly income are believed to have a higher risk tolerance (Grable, 2000: 628). Cohn et al. (1975: 613-614) show a strong trend of decreasing risk aversion as monthly income increases. This could be explained by the fact that high-income individuals have sufficient resources to balance possible losses (Rahmawati et al., 2015: 376). In our study, monthly income did not appear to be a factor influencing participants' financial risk tolerance.

Another factor we take into account is financial knowledge. Several studies have been conducted to determine the influence of financial knowledge on people's investment behavior. Most of these studies try to find out whether those with higher basic financial knowledge and skills are more risk-tolerant than those with lower basic financial knowledge and skills. Hermansson and Jonsson (2021) investigate the effects of financial knowledge and financial interest on risk tolerance by analyzing a sample of 12,156 Swedish bank customers. Their findings demonstrate that greater risk tolerance is related to both financial interest and knowledge. Yet, Gustafsson and Omark (2015) discover evidence that those who take financial risks likely to have higher financial risk tolerance are those who depend more on their intuition than their financial expertise. In addition, they indicate that stock market experience has a greater influence on financial risk tolerance than a basic financial background. As with many studies in the literature, looking at the trends of respondents in our study, it appears that participants' risk tolerance increases as their financial knowledge increases.

There are different opinions about the other variable, education. Some of the studies suggest that educated people become more risk-averse because education makes people more cautious and responsible. Belzil and Hansen (2002) show that mean schooling increases with

risk aversion, i.e., an increase in the degree of risk aversion leads counterfactually to an increase in the level of education. On the other hand, some studies indicate an inverse relationship between education and risk aversion. For instance, Hryshko et al. (2011) demonstrate that risk aversion is important for economic behavior by showing that it predicts the volatility of individual income and that a rise in high school graduation rates results in significantly fewer people in the following generation who are highly risk-averse. Black et al. (2015) find no evidence of a beneficial impact for women but find that for males, each additional year of education raises stock market involvement by roughly 2%. Furthermore, their findings show that males with greater levels of education also keep a bigger proportion of their assets in riskier financial instruments like equities. In our study, participants' risk tolerance decreases as their level of education increases.

Culture was the final variable in the study to determine risk tolerance. In societies where uncertainty avoidance is generally strong, risk tolerance is considered to be quite low. Through the association between culture and per capita wealth, culture is also indirectly connected to risk tolerance. Individuals in countries that have high per capita incomes are more likely to be trusting, individualistic, and have low-risk tolerance. On the other hand, risk tolerance is relatively high in countries with relatively low per capita income (Statman, 2010). In addition, While researching how culture affects business risk-taking, Mihet (2012) discovered that domestic enterprises take more risks in countries with lower levels of uncertainty aversion, lower tolerance for hierarchical connections, and greater levels of individualism. Contrary to what is predicted in the literature, in our study people living in Germany seem to have a higher risk tolerance than people living in Turkey.

In line with the purpose of this study and based on active/passive traits analysis the following hypotheses are proposed:

H1: The risk tolerance of individual investors is significantly influenced by age.
H2: The risk tolerance of individual investors is significantly influenced by gender.
H3: The risk tolerance of individual investors is significantly influenced by their job.
H4: The risk tolerance of individual investors is significantly influenced by marital status.
H5: The risk tolerance of individual investors is significantly influenced by monthly salary.
H6: The risk tolerance of individual investors is significantly influenced by financial knowledge.
H7: The risk tolerance of individual investors is significantly influenced by education.
H8: The risk tolerance of individual investors is significantly influenced by culture.

4. RESULTS

This section refers to the evaluation of the hypotheses based on the theoretical framework presented above, along with the research findings related to risk tolerance. Furthermore, the Behavioral Investor Types classification based on the active/passive traits and the risk tolerance findings is amplified. To test the research hypotheses, multiple linear regression analysis was performed. The scales were tested for reliability and normality before the regression was conducted. The reliability of the scales was tested by Cronbach's alpha value.

Cronbach's alpha for all categories shows a value of 0.716 which is above 0.70, indicating high internal reliability.

The last part of our survey includes further questions regarding risk tolerance to determine the risk profile of the participants. After identifying whether participants are active or passive, we used further risk tolerance questions to categorize the participants into the Behavioral Investor Types; Preservers, Followers, Independents, or Accumulators. The risk tolerance questions are obtained from Sejdiji 's survey, and to determine the behavioral type of investors, we used Pompian's model, which is explained in Figure 2 below.

Figure 2. Behavioral Investor Types
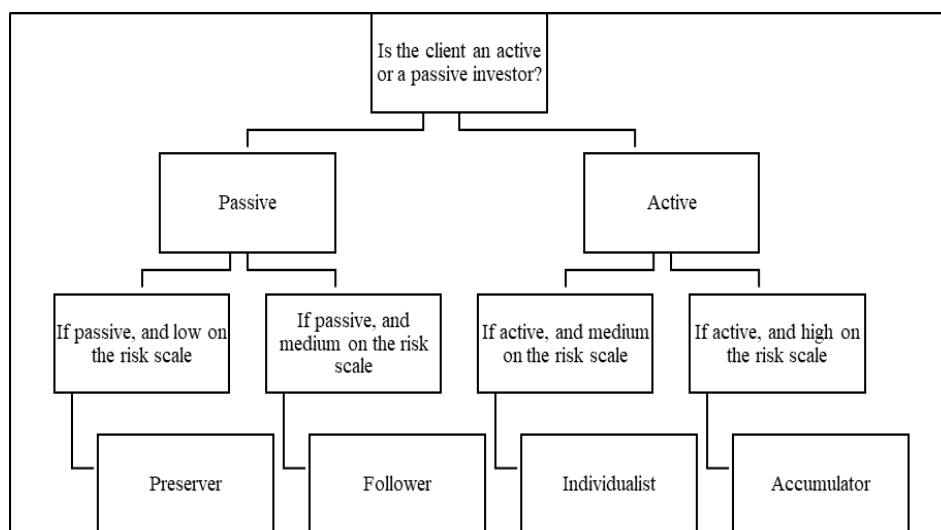
Source: Pompian (2012)

The participants who are passive and are on the low-risk scale are classified as Preservers. A Preserver is a risk-averse investor with the primary aim of preserving wealth. This type of investors are prone to loss aversion and status-quo biases. On the other hand, the participants who are passive but are on the medium-risk scale are classified as Followers. Followers are not interested in investment activities and are influenced by their environment. This type of investors are prone to recency and framing biases. The participants, meanwhile, who are active and are on the medium-risk scale are classified as Individualists. Individualist investors are interested and engaged in investment activities, which can lead to biases like confirmation or availability bias. Finally, the participants with a high-risk scale are classified as Accumulators. An Accumulator is a risk-seeking investor with the primary aim of accumulating wealth. As Accumulators are confident in their investment activities, they are prone to overconfidence and illusion of control biases. According to the results, most of the participants are "Followers" or "Individualist". Since the two extreme types "Preservers" and "Accumulators" are not too strongly represented in our sample, we can say that the participants are not very emotional in their investment behavior. Lying between these two extremes are the "Followers" and the "Individualists," both of whom mostly have cognitive biases (Pompian, 2012).

Table 2. Pearson Correlation

	RT	Age	Gen.	Job	Status	Salary	FK	Edu.	Cul.
RT	1,000	-0,017	-0,445	-0,014	0,041	0,027	0,121	-0,217	0,074
Age		1,000	-0,160	-0,177	0,414	0,220	-0,001	0,146	-0,227
Gen.			1,000	-0,008	-0,036	-0,183	-0,357	0,032	0,064
Job				1,000	-0,250	-0,326	-0,215	-0,034	0,247
Status					1,000	0,276	0,026	0,212	-0,191
Salary						1,000	0,286	0,204	-0,193
FK							1,000	0,354	0,041
Edu.								1,000	-0,126
Cul.									1,000

*All correlations are significant at the 0.01 level.

The Pearson correlation analysis is performed to measure the strength of the relationship between all variables. The correlation results given above show that there is no high correlation between the dependent variable and the independent variables and also between all independent variables. All values are less than 0.69, which is the highest acceptable value for a moderate correlation (Schober and Boer, 2018).

Table 3. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,510	,260	,211	,67937	2,040

The Durbin-Watson test is used to test for autocorrelation in the data set. We have a value of 2.04, which means that there is no autocorrelation in our model. In addition, the adjusted R-squared shows that about 21% of the variance in risk tolerance can be explained by the demographic and socioeconomic variables included in the model.

Table 4. ANOVA Results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	19,499	8	2,437	5,281	,000
	Residual	55,385	120	,462		
	Total	74,884	128			

For all variables, the variance inflation factor (VIF) indices are below the critical value of 10, which means that multicollinearity is not a problem. From the significance of the regression coefficients, it can be seen that both gender and education contribute to risk

tolerance; therefore, H2 and H7 are accepted. This means that gender and education are important factors in determining the risk tolerance of individual investors. However, contrary to expectations, age, occupation, marital status, monthly salary, financial knowledge, and culture were found to have no significant effect on risk tolerance; therefore, H1, H3, H4, H5, and H8 are rejected.

Table 5. Regression Coefficients

	Beta	**t**	**Sig.**	**Collinearity Statistics**	
				Tolerance	**VIF**
(Constant)		6,199	0,000		
Age	-,090	-0,998	0,320	,766	1,306
Gender	-,448	-5,009	0,000	,771	1,297
Job	-,034	-0,379	0,705	,767	1,303
Status	,121	1,330	0,186	,749	1,334
Salary	-,030	-0,337	0,737	,771	1,298
FK	,030	0,306	0,760	,632	1,581
Education	-,210	-2,325	0,022	,752	1,329
Culture	,080	0,942	0,348	,858	1,165

*Dependent Variable: Risk Tolerance

5. DISCUSSION AND CONCLUSION

The purpose of this study was to identify the determinants of individual financial risk tolerance. Therefore, a survey with respondents from Turkey and Germany was conducted. Furthermore, the participants were categorized into behavioral investor types. Firstly, based on the analysis of the active/passive characteristics of the participants the hypotheses were established. Multiple linear regression analysis was used to test the research hypotheses established to measure the significance of demographic and socioeconomic variables in determining the levels of risk tolerance. The analyses show that both demographic factors and socioeconomic conditions are significant in distinguishing the levels of risk tolerance. Gender and education were found to determine risk tolerance. Secondly, in the Behavioral Investor Types classification, it is also interesting to note that most participants were mostly categorized as "Followers" or " Individualist". These investor types are known to have moderate to growing levels of risk tolerance and are especially prone to cognitive biases rather than emotional biases.

The gender whose influence on risk-taking behavior has been one of the most researched aspects was tested to see if risk tolerance differs between men and women, and consistent with the literature, we found that women were more likely to be risk-takers than men. Risk-taking behavior is more common among men, while women are somewhat more risk-averse because they have lower lifetime income, lower-income growth, lower wealth, and lower employment rates.

Education is a factor with ambivalent opinions in the literature. On the one hand, Hryshko et al. (2011), Black et al. (2015) and Sung and Hanna (1996) suggest that with rising education risk tolerance rises as the risk assessment capacity increases. On the other hand, Belzil and Hansen (2002) found that risk tolerance decreases with rising education. They argue that educated people are more cautious. In line with that, our results show that education and risk tolerance have an inverse relationship.

As stated, before the assessment of risk tolerance is important for the portfolio construction of investors. Therefore, our study has important implications, especially for financial advisors. When giving financial advice our results regarding gender, education, and behavioral investor types can be an additional hint for the advisors apart from the information gathered from regular financial risk questionnaires. Furthermore, our study contributes to the wide literature on the effects of socio-demographic variables on financial risk tolerance. Nevertheless, there is no consensus in the literature on how the different socio-demographic variables each influence the risk attitude. Our results support the domaining view of women being less risk-tolerant, but regarding education, our results show contrary to the major literature that education negatively impacts risk tolerance. In a further step, the underlying reasons could be examined to give a better understanding of how the socio-demographic variables influence risk tolerance.

REFERENCES

Anbar, Adem - Eker, Melek (2010), "An Empirical Investigation for Determining of the Relation Between Personal Financial Risk Tolerance and Demographic Characteristic", Ege Academic Review, 10(2), pp. 503-523.

Antonites, Alex - Wordsworth, Russell (2009), "Risk Tolerance: A Perspective on Entrepreneurship Education", Southern African Business Review, 13(3), pp. 69-85.

Belzil, Christian – Hansen, Jörgen (2002), "Unobserved Ability and the Return to Schooling", Econometrica, 70(5), pp.2075-2091.

Black, Sandra E.- Devereux, Paul J.- Lundborg, Petter- Majlesi, Kaveh (2015), "Learning to Take Risks? The Effect of Education on Risk-Taking in Financial Markets", NBER Working Paper No. 21043.

Cohn, Richard A.- Lewellen, Wilbur G.- Lease, Ronald C.- Schlarbaum, Gary G. (1975). Individual investor risk aversion and investment portfolio composition. Journal of Finance, 30, pp. 605-620.

Dohmen, Thomas- Falk, Armin- Huffman, David- Sunde, Uwe- Schupp, Jürgen- Wagner, Gert G. (2011), "Individual Risk Attitudes: Measurement, Determinants, and Behavioral Consequences", Journal of the European Economic Association, 9(3), pp. 522-550.

Fisher, Patti J. – Yao Rui (2017), "Gender Differences in Financial Risk Tolerance", Journal of Economic Psychology, 61, pp. 191-202.

Grable, John E. (2000), "Financial Risk Tolerance and Additional Factors That Affect Risk Taking in Everyday Money Matters", Journal of Business and Psychology, 14(4), pp. 625-630.

Grable, John and Joo, So-Hyun (2004), "Environmental and Biopsychosocial Factors Associated with Financial Risk Tolerance", Journal of Financial Counseling and Planning, 15(1), pp.73-82.

Gustafsson, Carina – Omark, Lisa (2015), "Financial Literacy's Effect on Financial Risk Tolerance - A Quantitative Study on Whether Financial Literacy has an Increasing or Decreasing Impact on Financial Risk Tolerance", Umeå School of Business and Economics Spring Semester, Degree Project, http://www.diva-portal.org/smash/get/diva2:826787/FULLTEXT01.pdf, (Date of access: 01.03.2023)

Halek, Martin – Eisenhauere, Joseph G. (2001), "Demography of Risk Aversion", The Journal of Risk and Insurance, 68(1), pp. 1-24.

Hallahan, Terrence A.- Faff, Robert W. – McKenzie, Michael D. (2004), "An Empirical Investigation of Personal Financial Risk Tolerance", Financial Services Review, 13, pp. 57-78.

Hermansson, Cecilia – Jonsson, Sara (2021), "The Impact of Financial Literacy and Financial Interest on Risk Tolerance", Journal of Behavioral and Experimental Finance, 29, pp.1-12.

Hryshko, Dmytro- Luengo-Prado, María José – Sorensen, Bent E. (2011), "Childhood Determinants of Risk Aversion: The Long Shadow of Compulsory Education", Journal of the Econometric Society, 2(1), pp.37-72.

Kahneman, Daniel – Riepe, Mark W. (1998), "Aspects of Investor Psychology", The Journal of Portfolio Management, 24(4), pp. 52-65.

Mihet, Roxana (2012), "Effects of Culture on Firm Risk-Taking: A Cross-Country and Cross-Industry Analysis", Journal of Cultural Economics, 37(1), pp. 1-49.

Plott, Charles – Smith, Vernon (2008), Handbook of Experimental Economics Results, Volume 1, First Edition, North Holland.

Pompian, Michael M. (2012), Behavioral Finance and Investor Types: Managing Behavior to Make Better Investment Decisions, Wiley Finance Series, Canada.

Rahmawati- Kumar, M. Dileep- Kambuaya, Meyland – Jamil, Farhan – Muneer, Saqib (2015), "Determinants of the Risk Tolerance of Individual Investors", International Journal of Economics and Financial Issues, 5, pp. 373-378.

Saraç, Mehmet – Kahyaoğlu, Mehmet Burak (2011), "Bireysel Yatırımcıların Risk Alma Eğilimine Etki Eden Sosyo-Ekonomik ve Demografik Faktörlerin Analizi", BDDK Bankacılık ve Finansal Piyasalar Dergisi, 5(2), ss. 135-157.

Schober, Patrick – Boer, Christa (2018), "Correlation Coefficients: Appropriate Use and Interpretation", Anesthesia & Analgesia, 126(5), pp. 1763-1768.

Sejdiji Zimer (2017), "Risikoprofilierung von Privatanlegern in der Schweiz – Eine Untersuchung der Korrelation von Risikotoleranz und Finanzfachwissen", Zürcher Hochschule für Angewandte Wissenschaften ZHAW School of Management and Law Abteilung Banking, Finance, Insurance Bachelor of Science in Business Administration Studienrichtung Banking and Finance Bachelorarbeit, https://digitalcollection.zhaw.ch/bitstream/11475/1377/1/Sejdiji_Zimer_W.BA.BO.BF.pdf, (Date of access: 01.01.2022)

Statman, Meir (2010), "The Cultures of Risk Tolerance", Available at SSRN: https://ssrn.com/abstract=1647086 or http://dx.doi.org/10.2139/ssrn.1647086, (Date of access: 01.05.2022)

Sung, Jaimie – Hanna, Sherman (1996), "Factors Related To Risk Tolerance", Financial Counseling and Planning, 7, pp. 11-19.

Wang, Hui – Hanna, Sherman (1997), "Does Risk Tolerance Decrease With Age?", Financial Counseling and Planning, 8(2), pp. 27-31.

West, Stephen G.- Finch, John F. - Curran, Patrick J. (1995), Structural Equation Models with Nonnormal Variables: Problems and Remedies. In R. H. Hoyle (Ed.), Sage Publications, Structural Equation Modeling: Concepts, Issues, and Applications, pp. 56-75.

Yao, Rui – Hanna, Sherman D. (2005), "The Effect of Gender and Marital Status on Financial Risk Tolerance", Journal of Personal Finance, 4(1), pp. 66-85.