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Navigating Risk Terrain in the Twenties: Understanding Age-Linked Gender Dynamics in Risk Aversion between 20-29 year old Men and Women

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A Thesis

Presented to

The Faculty and the Honors Program

Of the University of San Diego

By

Mollie Dostalek

Finance

2024

Honors Thesis Approval Page

Student Name: Mollie Dostalek

Title of Thesis: Navigating Risk Terrain in the Twenties: Understanding Age-Linked Gender Dynamics in Risk Aversion between 20-29 year old Men and Women

Accepted by the Honors Program and faculty of the Department of Finance, University of San Diego, in partial fulfillment of the requirements for the Degree of Bachelor of Business Administration.

FACULTY APPROVAL

Dr. Melina Vosse		May 21, 2024
Faculty Project Advisor (Print)	Signature	Date
Dr. Susannah Stern Honors Program Director		
	Signature	Date

Abstract

This research aims to explore the age and gender-linked dynamics of risk aversion in investment decisions among adults aged 20-29, focusing on the disparities between men and women. While most literature often portrays young men as having higher risk appetites, this study aims to evaluate such assumptions, shedding light on the nuanced relationship between gender and risk aversion across the early adult years. This research seeks to discern patterns and variations in risk aversion, investigating whether age plays a significant role in shaping these dynamics. By analyzing data that demonstrates the relationship between gender, age, and risk aversion, this study offers insights for managers, investors, and researchers. Ultimately, this paper aims to empower people with specific risk profiles and foster informed decision-making.

1. Introduction

Personal finance is an ever-evolving and growing landscape, with more participants than ever. According to the United States Federal Reserve, as of 2022, a record number of 58% American households own stock, which is up from 53% in 2019 and 52% in 2016. However, current literature often portrays men as risk-tolerant while women are perceived as risk-averse and limited participants in financial decisions. This gender disparity underscores a critical need to address these stereotypes. The increase in stock market participation among both genders highlights the importance of financial literacy and risk management strategies, especially for young adults and women. During an individual's twenties, they often navigate newfound financial freedom and opportunities to earn, save, and invest. This transformative period lays the foundation for emerging adults' long-term financial well-being. Financial recommendations and academic literature play a vital role in guiding these young adults, offering valuable insights, strategies, and advice tailored to their unique needs and aspirations. Given the myriad of options available, access to reliable and relevant financial information becomes indispensable for emerging adults striving to build a secure future, regardless of gender. Understanding risk tolerance is critical in this context, as it shapes financial decisions and portfolio construction. When an investor aligns their choices with their risk tolerance, they are likely to more closely align their financial goals with their preferences. By understanding their risk tolerance levels, investors can avoid impulsive and emotional financial decisions, and instead tailor their financial objectives more effectively, rather than relying on generalized recommendations. Thus, addressing the gap in emerging adult risk literature and exploring gender stereotypes by providing structured recommendations on how to handle risk preferences can significantly

empower emerging adults, including women, to make informed and suitable financial decisions during this metamorphic time in their lives.

The core of this research is to examine the way age affects risk aversion, and if men exhibit lower levels of risk aversion as suggested by the majority of existing literature. Using a survey based approach, the Grable and Lytton survey was given to participants on the platform Amazon Mechanical Turk (MTurk) matching the set restrictions. The data was analyzed using ordinary least squares regression analysis to determine if there were noticeable differences in risk aversion between genders and any age-related trends in risk-taking behavior. Through thorough examination, the goal was to provide insights into the gender-based differences in risk aversion and their potential evolution over the lifespan.

The analysis unveils intriguing insights into the relationship between demographic factors and risk attitudes. Despite initial indications of a slight divergence in risk tolerance between male and female participants based on mean differences, regression analysis reveals that gender exerts minimal influence on risk attitudes when accounting for other demographic variables. This suggests that while observable disparities may exist, they may not be solely attributable to gender. Furthermore, the interaction between gender and age groups underscores the complexity of this relationship, with gender's influence on risk aversion remaining insignificant across different age demographics.

While gender does not differentiate risk preferences among individuals in their twenties, marital and employment status display inverse relationships with risk aversion. These results indicate

that social and economic factors may play a more pronounced role in shaping risk attitudes for this age group.

The current study contributes to the literature on risk aversion by examining the roles of demographic factors in shaping individuals' risk preferences. This contribution is particularly relevant given the limited exploration of employment status and income as predictors of risk aversion in existing literature. Moreover, the study's findings underscore the importance of considering other factors when examining risk attitudes, highlighting the need for a more holistic understanding of the determinants of risk preference.

Previous research has highlighted the significance of demographic factors and key household characteristics in shaping wealth allocation and portfolio choice. For example, studies suggest that individuals adjust their investment strategies over their lifetime, influenced by factors such as age, occupation, and cognitive skills. Gender differences in risk aversion have also been observed, with men generally exhibiting higher levels of risk tolerance than women. However, some research suggests that women may practice higher risk aversion in certain contexts. This study aims to further our understanding of these dynamics by examining how age and gender intersect to influence investment decisions.

2. Literature Review

This study is broadly related to literature studying drivers of household financial decisions. Household finance literature has been primarily focused on understanding how households determine their optimal wealth allocation and portfolio choice. Existing work has shown that

demographic factors and key household characteristics—such as wealth—are significant determinants of household financial decisions and outcomes.

Research from Campbell (2006) suggests that many households make substandard investment decisions because they lack wealth and education. However, if these households wish to delegate financial decisions because of lack of resources, they could find themselves paying high fees to those delegates. Data from citizens in Norway suggest that they adjust their investment strategies throughout their lifetime. Early participants invest more in stocks as they accumulate wealth, but reduce or even exit the market all together as they approach retirement (Fagereng et al., 2017). Using U.S. household data, Addoum et al. (2023) note that individuals employed in locally clustered industries are more inclined to invest in risky assets, particularly those with higher labor income, skilled occupations, and strong cognitive skills, suggesting that industry clusters enhance human capital and risk tolerance.

This study is more closely related to existing literature that investigates which factors influence the propensity for individuals to take financial risk. Existing work has examined how factors such as race, culture, age, and gender influence wealth allocation decisions and trading behavior. Grinblatt and Keloharju (2002) find that individuals are more likely to trade stocks that are culturally similar to them. They hypothesize that the cultural similarity reduces the perceived risk. Education plays a pivotal role in shaping individuals' risk-taking behavior, as evidenced by Murtaza et al. (2011). Education expands individuals' perspectives, enabling them to assess risks more comprehensively and make informed decisions. Age significantly influences investment decisions and risk-taking behaviors. Younger investors prefer high risk-high return profiles,

while middle-aged investors tend to diversify and opt for moderate risk-high return strategies, and older investors lean towards low risk-high return profiles (Charles & Kasilingam, 2013).

In Croson and Gneezy's (2009) review, they compile a list of repetitive observations based on existing literature and studies to come to three distinct conclusions. First being the majority of lab and field studies indicate higher levels of risk aversion in males compared to females. The second observation is that women are hypersensitive to social cues, creating variability in their behavior. The last repetitive observation states that women often prefer less competitive environments compared to men. Jaiswal and Kamil (2012) conclude that men are more aggressive investors compared to women as they tend to invest as a source of growth appreciation rather than steady income. Behaviorally, men are also more susceptible to over confidence, over reaction, and the prospect theory. The implication being that men seek risk more often than women thanks to their susceptibility to behavioral mistakes (Jaiswal & Kamil, 2012). Byrnes et al. (1999) discovered in a meta-analysis of 150 studies that in most instances, men were more likely to take risk than women. However, the study noted that this gap often grows smaller over time (as men and women get older).

The sentiment that women often have greater risk aversion when it comes to wealth management is reflected by Sah et al. (2022). The article found that female CEOs practice a higher level of risk-aversion compared to male CEOs. Grable (2000) utilizes a novel risk-aversion index to conclude that men are more risk tolerant than women. Grable and Roszkowski (2007) build on these findings and demonstrate that women underestimate their risk tolerance and shy away from risky investments. In 2009, a study investigated traffic adherence among genders, finding that

conforming to masculine stereotypes correlates with risky pedestrian behaviors among adolescents. Additionally, age and school level impact risk-taking tendencies, with older adolescents showing higher risk behaviors and lower attention to traffic dangers, while girls demonstrate greater adherence to pedestrian rules (Granié, 2009).

Reniers et al. (2016) examined adolescent risk perception and behavior, revealing significant gender and age differences. Males exhibited lower risk perception, higher risk-taking behavior, and less social anxiety compared to females, while older participants showed increased risk-taking behavior, highlighting the influence of personality traits, gender, and age on risk-related outcomes in adolescents. Deeks et al. (2009) found significant correlations between gender, age, and health-related behaviors, emphasizing gender disparities in health beliefs, with women prioritizing disease prevention and seeking medical advice more often than men. Additionally, older participants express greater concerns about future health risks and exhibit more proactive attitudes towards preventive health measures, highlighting the importance of considering gender and age dynamics in health awareness interventions. Gender differences in risk aversion are apparent in decision-making, with women showing heightened concerns about uncertainty, time, and consequences, while men emphasize information analysis and goal-setting (Ardila et al., 2011).

The work of Dr. Grable has long been regarded as foundational in the field of risk assessment. His thirteen item survey has been used since 1999 to quantify the risk level individuals are willing to take, however in his research, there are perceivable gaps. In 2000, he used this very survey measure to conclude “(a) males were more risk tolerant than females, (b) older

respondents were more risk tolerant than younger respondents," (Grable, 2000). One notable limitation in Grable's research or report is the absence of specific metrics for the demographic groups under study. Without detailed demographic data, it becomes challenging to understand the nuances of how different demographic factors may influence the variables of interest. Additionally, Grable fails to test for correlations between two or more demographic factors, which could provide valuable insights into potential interactions or confounding variables. Moreover, the conclusions drawn in the research lack robust statistical evidence to support their validity, meaning more data should be collected and analyzed.

This research contributes to the existing literature by providing insight into the multiple factors that contribute to households' understanding of financial decisions and risk taking behaviors. While existing studies have highlighted the importance of education, wealth, and culture on wealth management, this research aims to explore the intersectionality of gender and age on investment decisions. Most research tends to focus on either gender or age individually, rather than examining age as an additional factor that interacts with gender to contribute to risk-taking disparities. Unlike previous research, this study will focus on surveying an understudied age group, early adulthood, ages 20 to 29. The goal is to offer an understanding of how age and gender jointly shape investment decisions and establish patterns between the two demographic characteristics at such a critical time in an individual's life. This research hopes to establish awareness of young adults investment practices and use that awareness to design financial management tools focused on age and gender.

3. Research Design

a. Sample

For participant selection, this study utilized the online platform Amazon MTurk to generate responses from workers on the site. Criteria for inclusion included men and women between the ages of 20 and 29 living in the United States Individuals failing to meet these criteria were excluded from data analysis. Data was collected from a total of 436 participants, with 315 identifying as male and 121 as female.

Participants were asked to report demographic information, including age, gender, marital status, parental status, state of residence, employment status, annual household income, and race. This information was collected to be used as control variables for statistical analysis in the study.

The intended sample size for the study was 500 participants. 436 participants started the survey. However, after data cleaning and removing incomplete responses, the final sample size at the end of the study was 327 participants.

b. Empirical Methodology

Responses from participants were recorded using Qualtrics and exported to Excel. Each response was numerically coded and then added to other responses to create a comprehensive risk aversion score. Higher scores suggested higher tolerance for risk. In Excel, responses were cleaned to ensure accurate data. Participants that did not give accurate location data, were outside the intended age range, missed the attention check question and failed to answer any of the risk aversion questions were excluded from analysis. The attention check question was a general

knowledge question used to ensure participants were still paying attention and their responses were reliable.

c. Measuring Risk Aversion

To analyze the role of gender on risk aversion, I utilize a standardized measure of risk aversion developed by Grable and Lytton (1999).Grable and Lytton (1999) are recognized for their risk aversion assessment, wherein they devised a robust and extensively validated scale for measuring an individual's propensity for risk. The Grable and Lytton (G&L) survey has long been regarded as " one of the only peer-reviewed public—no cost—assessment tools available to consumers, practitioners, and researchers. Since its introduction in 1999, more than 200,000 consumers have used the scale to evaluate their tolerance for financial risk." (Kuzniak et al., 2015, p. 181). Their scale, consisting of thirteen multiple-choice questions, provided a comprehensive framework to ascertain a person's risk aversion tendencies. Each response was assigned a numerical value, those values were summed to create a comprehensive score. Higher scores indicated lower risk aversion (See Appendix B).

d. Data Collection

Responses from participants were recorded using Qualtrics and exported to Excel. Each response was numerically coded and then added to other responses to create a comprehensive risk aversion score. Higher scores insinuated higher risk tolerance. In Excel, responses were cleaned to ensure accurate data. Participants that did not give accurate location data, were outside the intended age range, missed the attention check question and failed to answer any of the risk aversion questions were excluded from analysis. The attention check question was a general knowledge question used to ensure participants were still paying attention and their responses were reliable.

e. Empirical Methodology

The effects of gender and age on risk aversion are measured using ordinary least squares (OLS) regression analysis. Two different regression tests were performed as primary forms of data analysis. The first regression was meant to evaluate the effect of gender on risk aversion and the second was meant to measure how risk aversion varies by age across gender. Specifically, I use the following regression specification to test whether risk aversion differs across gender:

$$Risk\ Aversion_i = \alpha + \beta\ Gender_i + \gamma_i + \varepsilon$$

Where beta is the coefficient of interest. *Gender* is an indicator variable which takes the value of 1 if the respondent is male and 0 if the respondent is female. Gamma represents a vector of individual controls including employment status, income, marital status, familial status, and state.

To test whether risk aversion varies by gender across age groups, I run the following specification:

$$Risk\ Aversion_i = \alpha + \beta_1\ (Gender_i \times Age_i) + \beta_2\ Gender_i + \beta_3\ Age + \gamma_i + \varepsilon$$

Where the dependent variable is the risk tolerance for an individual, α is the intercept. The coefficient of interest in this specification is β_1. A positive coefficient on the interaction term indicates that risk aversion increases for men relative to women as age increases. Alternatively, a negative coefficient indicates that risk aversion decreases for men relative to women as age increases. Gamma represents a vector of control variables including employment status, income, marital status, familial status, and state.

4. Primary Results

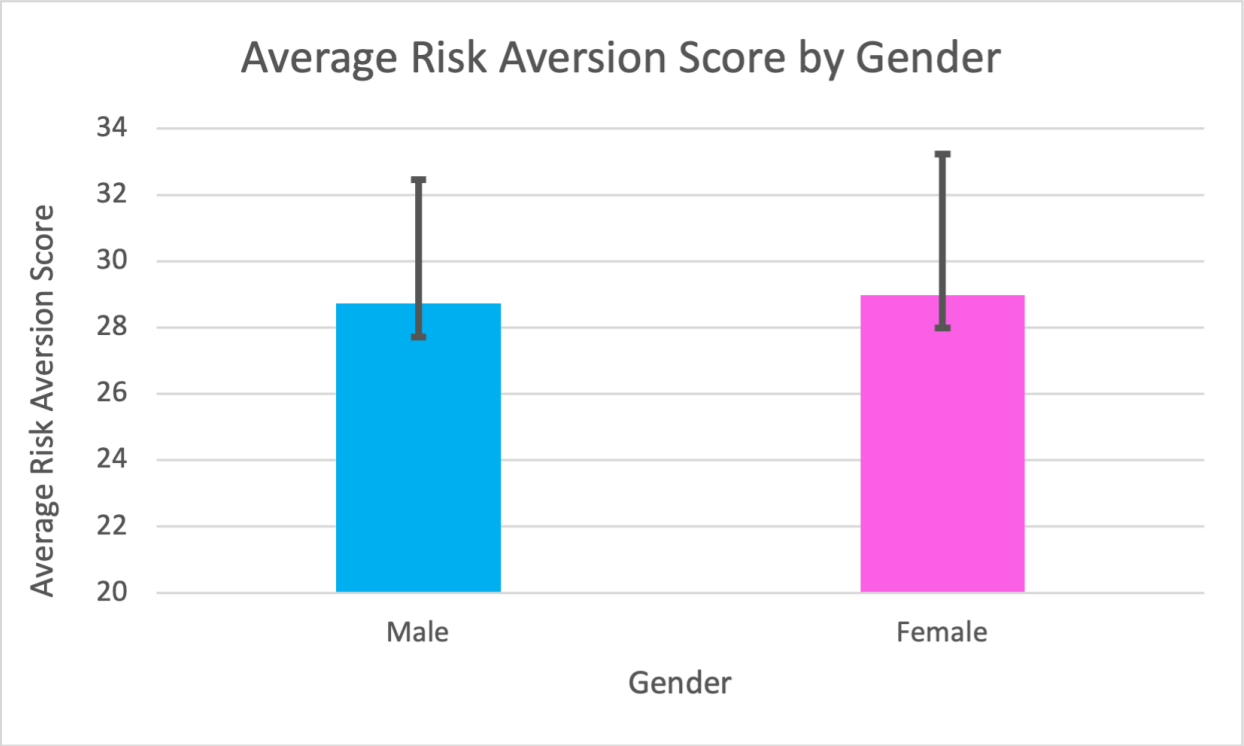
a. Effect of Gender on Risk Aversion

i. Difference of means

The analysis of the difference of means between male and female participants indicates that male participants had an average risk aversion score of approximately 28.72, while female participants had an average risk aversion score of approximately 28.98. In the context of risk aversion, a higher score actually suggests a higher level of risk tolerance. Therefore, the results suggest that, on average, female participants exhibited slightly higher risk tolerance compared to male participants. This insinuates that, within the sample studied, females may be more inclined to accept higher levels of risk in financial decision-making contexts compared to males.

Figure 1

Average risk aversion score by gender displayed graphically



ii. Regression analysis

Table 1

Regression results progressively adding on control variables

Table 1: Gender and Risk Tolerance

Variable	(1)	(2)	(3)	(4)	(5)
Gender	0.261	0.361	0.556	0.427	0.390
	[0.585]	[0.462]	[0.239]	[0.369]	[0.417]
Age		0.092	0.058	-0.052	-0.047
		[0.379]	[0.565]	[0.636]	[0.669]
Employment			-3.645	-3.424	-3.292
			[0.014]*	[0.020]*	[0.027]*
Income			1.133	1.105	1.095
			[0.000]*	[0.000]*	[0.000]*
Marital status				-1.355	-1.430
				[0.074]	[0.063]
Children				0.164	0.132
				[0.816]	[0.851]
State					0.008
					[0.560]
Constant	28.457	27.617	28.430	30.847	30.740
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Observations (N)	327	327	327	327	327
R^2	0.001	0.003	0.106	0.123	0.124

Note: * $p < 0.05$

In the third regression analysis, controlling for age, employment, and income, there is significant statistical analysis. The coefficient for employment status shows a statistically significant negative impact on risk aversion, with a coefficient of -3.64 and a p-value of 0.014. Furthermore, the coefficient for income demonstrates a highly significant association with risk tolerance, with a coefficient of 1.13. Conversely, the coefficients for age and gender do not appear to have a significant impact on risk aversion, with p-values of 0.565 and 0.239, respectively.

The fourth and fifth regression analyses, controlling for marital status and familial status (jointly) and location, echo these findings. In the regression analysis, the coefficient for marital status shows a marginally significant negative impact on risk aversion score, with a coefficient of -1.43 and a p-value of 0.063. Other variables in the model show more pronounced effects on risk aversion. Notably, employment status demonstrates a statistically significant negative impact, with a coefficient of -3.29 and a p-value of 0.027. Additionally, income exhibits a highly significant positive association with risk tolerance, with a coefficient of 1.09. Variables such as age, gender, presence of children, and state of residence do not appear to have a significant impact on risk aversion, as their coefficients have p-values greater than 0.05.

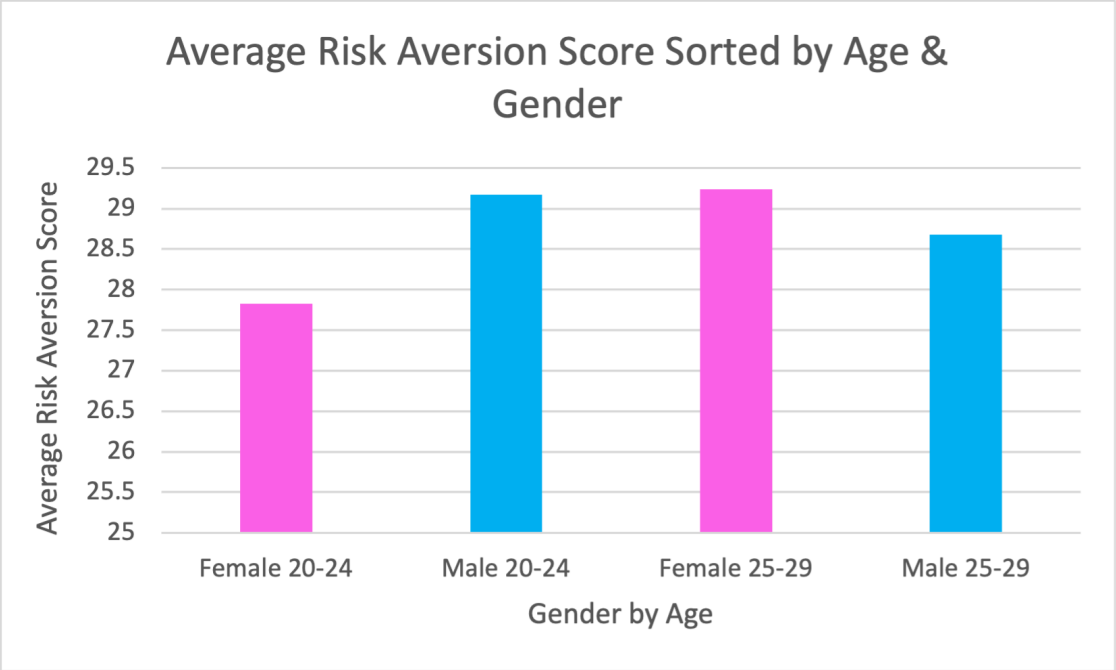
b. Effect of Interactions of Age and Gender on Risk Aversion

i. Difference of means

Female participants aged 20-24 had an average risk aversion score of approximately 27.82, while male participants in the same age group had an average risk aversion score of approximately 29.18. Female participants aged 25-29 had an average risk aversion score of approximately 29.24, while male participants in the same age group had an average risk aversion score of approximately 28.68. Therefore, these findings imply a potential shift in risk attitudes as individuals progress through different stages of life, with women becoming more accepting of risk as they age, while men may become more risk-averse over time.

Figure 2

Average risk aversion score by gender across age displayed graphically



ii. Regression analysis

Table 2

Regression results using an interaction term and control variables

Table 2: Gender and Age Combined on Risk Tolerance

Variable	Coefficient
Interaction Term	0.014
	[0.797]
Marital status	-1.402
	[0.067]
Children	0.198
	[0.778]
Employment	-2.918
	[0.042]*
Income	1.102
	[0.000]*
State	0.011
	[0.454]
Intercept	27.617
	[0.000]
Observations (N)	327
R^2	0.122

Note: * $p < 0.05$

The results of the regression analysis indicate several noteworthy findings. The coefficient for the interaction term (age combined with gender) is found to be non-significant at a coefficient 0.014 (p = 0.797), suggesting that the interaction between variables does not significantly affect risk aversion. Marital status exhibits a coefficient of -1.402, with a marginally significant p-value of 0.067. The coefficients for the number of children at coefficient 0.198 (p = 0.778) and state of residence at coefficient 0.011 (p = 0.454) are both non-significant, indicating that these variables

do not significantly influence risk aversion. Employment status, however, demonstrates a statistically significant impact on risk aversion, with a coefficient of -2.918 and a p-value of 0.042. Additionally, income exhibits a highly significant association with risk tolerance, with a coefficient of 1.102.

5. Discussions & Conclusions

While the difference of means suggests a slight divergence in risk tolerance between male and female participants, the regression analysis reveals that gender exerts minimal influence on risk attitudes when other demographic variables are considered. Despite the marginally lower average risk aversion scores observed among male participants, the regression coefficients for gender consistently remain non-significant across various models. Similarly, the difference of means analysis suggests a divergence in risk attitudes between male and female participants across different age groups. Specifically, female participants aged 20-24 exhibit slightly lower average risk aversion scores compared to their male counterparts, while females aged 25-29 display marginally higher scores to their male counterparts. However, when considering the regression analysis, the coefficients for gender consistently remain non-significant, indicating that gender alone may not significantly influence risk aversion when other demographic variables are taken into account.

Throughout the regression models, the coefficient for gender consistently remains below 0.556430966431204, suggesting a lack of significant relationship between gender and risk aversion. Furthermore, the interaction term, with a coefficient of 0.013771117, underscores the absence of a discernible relationship between gender and risk attitudes across different age

groups. These findings collectively suggest that gender is unlikely to exert a significant influence on risk aversion, irrespective of age demographics.

Key observations emerge from the analysis: both marital status and employment status exhibit inverse relationships with risk aversion scores. As scores for marital and employment status decrease, risk tolerance increases. The coding system, wherein married is denoted as 1 and single as 2, allows us to infer that married individuals tend to possess higher risk tolerance or lower risk aversion. Similarly, the coding for employment status, with employment represented by 1 and unemployment by 2, suggests that employed individuals typically demonstrate higher risk tolerance or lower risk aversion. Additionally, income displays a positive correlation with risk aversion scores, given its coding ranging from 1 to 5. Consequently, higher-earning individuals are inclined towards higher risk tolerance or lower risk aversion. However, it's worth noting that the statistical significance of marital status on risk aversion scores was only moderately significant (p-value > .05).

6. Considerations & Limitations

While the present study sheds light on the determinants of risk aversion, several limitations warrant consideration and suggest avenues for future research. Firstly, investigating the influence of external factors, such as economic conditions or socio-political events, on risk attitudes could provide valuable insights into the broader contextual determinants of risk aversion.

A notable limitation pertains to participant demographics, specifically regarding gender and age representation. Among all participants surveyed, only approximately 11.6% identified as female.

Additionally, a significant proportion, approximately 39.7%, fell within the age range of 20-24 out of 20-29. While the study maintains confidence in the validity of its findings based on the available data, it is essential to acknowledge the potential implications of these demographic imbalances. The disproportionate representation of female participants suggests a potential gap in perspectives or experiences, particularly those specific to women, which may not have been fully captured or analyzed in the study. Similarly, the overrepresentation of participants within the 20-24 age range raises questions about the broader applicability of the findings across different age groups within the 20-29 demographic. Consequently, there exists a possibility that a more balanced representation across gender and age demographics could alter the study's outcomes.

Another potential concern relates to the measurement of risk aversion. Different methods of measuring risk aversion, such as surveys, experimental tasks, or behavioral observations, may yield varying results. For instance, alternative surveys or measures might emphasize different aspects of risk aversion or use different scales or response formats, leading to divergent assessments of participants' risk preferences. However, it is important to note that the Grable and Lytton survey employed in this study is widely recognized as a comprehensive and reliable measure of risk aversion in financial decision-making contexts.

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8. Appendix

Appendix A

Research Approvals

Ethics approval was obtained from the Institutional Review Board at the University of San Diego under the IRB number IRB-2024-130 prior to posting the survey on Amazon Mechanical Turk (MTurk). The approval was granted February 26, 2024. Modifications were made to the study to add additional demographic questions and approval was granted April 4, 2024. The University of San Diego's Honors Program Board approved the Lawrence Hinman Honors Research Grant of $500, which has been utilized to employ the MTurk platform for participant recruitment. Utilizing MTurk offers advantages over convenient sampling, such as increased diversity and broader representation of the population. MTurk's survey approach allows researchers access to a nationwide pool of participants, enhancing generalizability by capturing diverse demographics and perspectives. Despite associated costs, transitioning to MTurk contributes to the quality and rigor of research studies, as emphasized by Mason & Suri (2011). Thus, all participants recruited were through MTurk.

Appendix B

Grable and Lytton Survey

Add Advisor Logo Here

13-Item Risk Tolerance Scale

(developed by Dr. John Grable & Dr. Ruth Lytton)

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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 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?**

Source: Grable, J. E., & Lytton, R. H. (1999). Financial risk tolerance revisited: The development of a risk assessment instrument. *Financial Services Review, 8,* 163 – 181.

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13-Item Risk Tolerance Scale

(developed by Dr. John Grable & Dr. Ruth Lytton)

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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

Source: Grable, J. E., & Lytton, R. H. (1999). Financial risk tolerance revisited: The development of a risk assessment instrument. *Financial Services Review, 8,* 163 – 181.

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Scoring

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 D = 4
13. A = 1 B = 2 C = 3 D = 4

* Answers to questions 9 and 10 can be averaged to obtain a combined score.

SCORE LEVEL

33 – 47 High tolerance for risk

29 – 32 Above-average tolerance for risk

23 – 28 Average/moderate tolerance for risk

19 – 22 Below-average tolerance for risk

0 – 18 Low tolerance for risk

To contribute to the University of Missouri's Personal Financial Planning study on measuring financial risk tolerance, you can enter results anonymously at this website: http://pfp.missouri.edu/research_IRTA.html

Source: Grable, J. E., & Lytton, R. H. (1999). Financial risk tolerance revisited: The development of a risk assessment instrument. *Financial Services Review, 8,* 163 – 181.