

## RISK ATTITUDES, FINANCIAL LITERACY AND FINANCIAL BEHAVIOR: A GENDER SPECIFIC COMPARISON

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**ABSTRACT.** This paper investigates the relationship between risk attitudes, financial literacy, and behavior in personal finance, focusing on gender differences. Using surveys, we analyze 52 students enrolled in a Personal Finance course. Men exhibit higher financial literacy and are inclined towards long-term investing. Women show greater satisfaction with spending habits and tend to be more risk-averse. Parental influence varies, with women perceiving positive role models. Correlation analysis reveals significant connections among risk perception, financial literacy, behavior, and parental influence. Gender disparities extend to preferences in financial products, with women favoring safer investments. The study illuminates the nuanced dynamics shaping investment decisions.

### 1. INTRODUCTION

Understanding the intricate relationship between risk attitudes, financial literacy, and financial behavior is fundamental in navigating the complex landscape of personal finance. However, when this exploration is interlinked with the influence of gender, a myriad of nuances and disparities surfaces, shaping a compelling area of research. This study delves into the domain of gender-specific disparities in risk attitudes, financial literacy, and financial behavior, aiming to uncover the multifaceted layers that define these distinctions.

At the core of financial decision-making lies the nexuses between an individual's risk attitude, financial knowledge, and subsequent behaviors. The lens through which men and women perceive and engage with financial matters has been a subject of intense academic scrutiny. This scrutiny stems from the observable variations in risk attitudes, financial literacy levels, and financial behaviors between genders. The implications of these differences extend beyond individual decision-making, influencing economic stability at both micro and macro levels.

The notion that men and women exhibit distinct risk attitudes forms the cornerstone of numerous studies. Research by Croson and Gneezy (2009), Eckel and Grossman (2002), Gu, Peng and Zhang (2019), Byrnes et al. (1999), Hryshko et al. (2011) as well as many others, has explored these variations. Croson and Gneezy (2009) suggest that women tend to be more risk-averse, a disposition attributed to societal expectations and cultural norms. This conclusion was also arrived upon by Gu, Peng and Zhang (2019) using their channel decomposition analysis. Conversely, Eckel and Grossman (2002) proposed a contextual dependence for gender-based risk attitudes, challenging the absolute nature of these differences.

Financial literacy, a critical component in making informed financial decisions, has been a focal point of analysis. The work of Lusardi and Mitchell (2014) highlighted a consistent gender gap in financial literacy, wherein women scored lower than men across various countries. However, Atkinson and Messy (2012) provided a counter-narrative, suggesting that the gender

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gap might be more aligned with confidence levels in financial decision-making rather than a lack of knowledge.

Beyond literacy, financial behavior patterns diverge between genders. Drexler, Fischer, and Schoar (2014) suggest that gender disparities in financial behavior are not solely dictated by literacy levels. Women, they found, tend to make more conservative decisions due to not just lower financial literacy but also their inherent risk aversion, often influenced by societal and cultural expectations. These conclusions seem to form the consensus within the academic literature, although there's also research suggesting a contrasting perspective. One such study is the work by Charness and Gneezy (2012). The authors delved into the impact of financial literacy on financial behavior, specifically observing how financial literacy influences risk-taking behavior differently in men and women. Their study, conducted through experimental settings, indicated that higher financial literacy levels led to more risk-taking behavior, particularly among men. This study found that for men, higher financial literacy was positively correlated with increased risk-taking in financial decisions. Conversely, for women, the relationship between financial literacy and risk-taking behavior was less pronounced or even inverse in certain contexts. This research stands in contrast to the findings of Drexler, Fischer, and Schoar (2014), suggesting that the relationship between financial literacy and financial behavior, particularly risk-taking, may vary for different genders. It highlights the complexities in how financial literacy influences financial decision-making and the various differences in how men and women might respond to higher levels of financial knowledge when making financial choices.

Lastly, highlighted by MacCrimmon and Wehrung (1986), an intriguing valence that needs further investigation is the phenomenon surrounding individuals' risk tolerance, particularly the inclination to misrepresent risk aversion when engaging in self-assessment of their risk profile. The susceptibility to misjudgment stems from a combination of overconfidence and a prevalent tendency to overstate one's risk preferences. This phenomenon has been investigated further by Stoian et al. (2021) who found the same risk-discrepancy between the so-called subjective risk (self-assessed) and the calculated objective risk attitude. This aspect underscores the need for a more thorough understanding of how individuals perceive and evaluate their own risk inclinations, shedding light on the factors that contribute to potential distortions in risk assessment.

In this context, this study aims to examine the varied dimensions of gender-specific differences in risk attitudes, financial literacy, and financial behavior. Factors related to parents' influence on respondents, their financial behavior, choices and investment preferences, as well as their financial literacy will be assessed during the analysis as to achieve a comprehensive understanding on the matter. This understanding is crucial in devising tailored financial education programs, policy initiatives, and societal adaptations that address these gender-specific disparities in personal finance and beyond. The exploration of gender-specific disparities in risk attitudes, financial literacy and financial behavior is vital in paving the way for more inclusive and effective financial practices, thereby contributing to a more equitable financial landscape.

Our research contributes to academic literature by employing a robust methodology on a distinctive group of undergraduate finance students enrolled in a specialized Personal Finance course with the focus of analyzing financial literacy in relationship with risk-aversion as well as other factors, thus bringing fresh perspectives on financial behavior and decision-making within this particular demographic. Eventhough the Personal Finance course was specifically designed to enhance financial literacy, there is a persistant gap in financial literacy between men and women. Thus, one of the goals of this study is to investigate why this phenomena occur. Moreover, the results of our study emphasize the significance of continuous endeavors to improve financial education.

This paper is organized as follows: Section 2 briefly revises the existing literature providing a context for the study. Section 3 focuses on the methodology behind the experiment and how it was executed. Section 4 discusses the empirical results, while Section 5 draws the concluding remarks.

## 2. LITERATURE REVIEW

**Gender and Risk Attitudes.** Gender differences in connection to risk preferences and risk aversion has been a widely studied topic by the academic literature, especially within the fields of finance and psychology. Even so, a consensus on the matter of what causes this differences has yet to be reached.

Studies by researchers such as Croson and Gneezy (2009) suggested notable variations in risk attitudes between genders. Women tend to exhibit more risk-averse behaviors compared to men. As shown by the authors, existing evidence suggests a complex interplay between these factors, urging further exploration into the relative weights and interactions of nature and nurture in shaping gender-specific preferences. The analysis reveals three noteworthy distinctions in preferences between men and women. Firstly, women demonstrate heightened sensitivity to social cues, contributing to increased variability in their behavior across experimental studies. Secondly, women consistently exhibit lower preferences for competitive situations, both in purely competitive contexts and bargaining scenarios, compared to their male counterparts. Lastly, the inquiry into the origins of these disparities suggests a complex connection between innate predispositions (nature) and learned behaviors (nurture). The question of whether these variations are innate (nature) or learned (nurture) remains a central point of inquiry of their study.

Contrastingly, Eckel and Grossman (2002) indicated that the gender differences in risk attitudes might not be as pronounced as previously assumed. In a controlled laboratory experiment, participants underwent the administration of the Zuckerman Sensation-Seeking Scale (SSS) before engaging in a decision-making task involving five distinct gambles, each associated with significant financial stakes. These gambles were intentionally varied in terms of both expected return and variance. The experimental design followed a between-subjects approach, presenting participants with one of two different frames. In one frame, participants received a fixed sum for completing a survey, and this sum was subsequently put at risk in the subsequent gamble choices. In the other frame, all payoff amounts for the gambles were non-negative. Participants received compensation based on their chosen gambles and the resulting outcomes. The primary objective was to examine potential gender differences in decision-making within this context. The findings indicated a consistent trend of women displaying higher levels of risk aversion, on average, compared to men. Notably, this distinction in risk attitudes persisted across both frames, suggesting that the framing of the task did not significantly impact gender-based differences in risk preferences. Following the decision-making task, participants were tasked with predicting the gamble choices made by their fellow participants. Subsequent rewards were provided for accurate predictions. Both male and female participants demonstrated an ability to surpass chance expectations in predicting the specific choices of individuals from both genders. However, a noteworthy pattern emerged – participants, irrespective of gender, tended to overestimate the risk aversion of their peers. This overestimation was particularly pronounced when men predicted the choices of women. The study's implications extend beyond the laboratory setting, highlighting the potential consequences of biased assumptions regarding women's risk attitudes in real-world scenarios. The authors delved into these implications, emphasizing the importance of recognizing and addressing such biases for a more accurate understanding of decision-making processes and their societal ramifications. Furthermore, their findings propose that the variation in risk-preferences might be more context-dependent than inherently gender-driven.

**Financial Literacy across Genders.** The issue of financial literacy has gained attention in recent years. Lusardi and Mitchell (2014) conducted studies revealing disparities in financial knowledge between men and women. The authors begin by establishing the critical role of financial literacy in modern societies, emphasizing its relevance for individual financial decision-making, retirement planning, and broader economic outcomes. The paper provides a comprehensive review of existing theoretical models that incorporate financial literacy and

its impact on economic behavior. One key aspect covered is the relationship between financial literacy and various economic outcomes, such as wealth accumulation, retirement preparedness, and investment choices. The authors also explore how financial literacy influences individual decision-making in credit markets, insurance, and housing. They found that men tend to display higher financial literacy levels compared to women. This difference is partly attributed to varying educational and societal influences. The research highlights the need for targeted financial education programs to bridge this knowledge gap.

On the contrary, research done by Atkinson and Messy (2012) challenges this notion, suggesting that gender differences in financial literacy may not solely stem from educational disparities but could also be associated with confidence levels in managing finances. Their study represents a substantial endeavor to assess the financial literacy levels of adults on a global scale. This survey, designed with a structured questionnaire, aimed to capture data on participants' financial knowledge and behaviors, covering diverse aspects such as budgeting, saving, investing, debt management, and understanding financial products. The survey also provided a comprehensive view of adult financial literacy across different countries. Although they found that men score higher, their study propose that women might be just as financially knowledgeable but lack confidence, which affects their apparent financial literacy. Furthermore, they found differences in financial attitudes between men and women across various countries and economies. According to their results, on average, 53% of women exhibit positive attitudes towards the longer term, in contrast to 47% of men. This trend is consistent in several countries, including Albania, Austria, Belgium, Belarus, the British Virgin Islands (BVI), Canada, France, Georgia, Hong Kong, China, Hungary, Malaysia, the Netherlands, Norway, and Thailand, where men are significantly less likely than women to have positive attitudes towards the longer term. However, in Jordan, the pattern is reversed, with women being notably less likely than men to hold such attitudes. Notably, women in Norway stand out for having longer-term perspectives compared to both their male counterparts in Norway and individuals in other countries.

Lastly, Stoian et al. (2021) focused on the nexuses between risk aversion, financial literacy, and investment preferences within the context of young adults in higher education in Romania. Through a survey encompassing measurements of basic, advanced, and overall financial literacy, along with assessments of risk aversion and parental financial behaviors, their analysis, employing OLS and IV econometric methods with a sample of 479 respondents, reveals compelling insights. Notably, the authors found that irrespective of its level, financial literacy contributes to a reduction in risk aversion as quantified by the risk premium. Furthermore, positive financial behaviors exhibited by parents are associated with a decrease in risk aversion, although this relationship is not observed in the case of self-assessed risk tolerance. The study also highlights that young adults' investment preferences are shaped by self-assessed risk tolerance rather than risk aversion. Additionally, financial literacy enhances the likelihood of young adults opting for bonds or funds as investment vehicles, yet it does not exert a statistically significant influence on the selection of stocks. The latter is predominantly guided by the self-assessed risk profile, along with bank deposits.

**Gender Disparities in Financial Behavior.** Analyzing financial behavior, several studies, such as that of Barber and Odean (2001) indicate distinct patterns in financial decision-making between genders. Women are often found to be more conservative in investment and expenditure compared to men. This conservative behavior is usually linked to risk aversion and the level of financial literacy. However, Barber and Odean (2001) presents a nuanced perspective, suggesting that gender-based financial behavior differences might stem from the fact that men are usually more confident, while women lack the same level of self-esteem. The central thesis of the paper revolves around the observation that men tend to trade more frequently than women in the stock market. The authors attribute this difference in trading behavior to overconfidence, suggesting that men exhibit higher levels of overconfidence compared to women, leading them to believe in their ability to successfully time the market or pick winning stocks. The study's

sample consists of 37,664 households identified by the gender of the person opening the first brokerage account. It draws from a primary dataset of 78,000 households' investments from a discount brokerage firm over six years. Common stock investments are the main focus, excluding other securities. A secondary dataset provides demographic information for the households. Men and women show differences in the duration of holding common stocks, and the study explores gender-related aspects of investment behavior, allowing the authors to analyze and draw conclusions about the impact of gender and overconfidence on investment decisions. Key findings of the research include evidence that overconfident investors, particularly men, tend to trade more frequently, resulting in lower net returns. The authors argue that this pattern is consistent with overconfident investors overestimating their stock-picking abilities and engaging in excessive trading, leading to suboptimal portfolio performance.

Contrarily, Berggren and Romualdo (2010) investigated the relationship between risk aversion, gender and overconfidence and found that both men and women have the same level of confidence when it comes to financial decisions. They have conducted the study largely on modern portfolio theory examining individual utility (risk theory or risk aversion) and behavioral aspects of investment behavior including overconfidence. The data for the study have been collected through surveying a very narrow target population, explicitly students at Umeå University. Authors used a stratified sample with four strata units divided by gender and level of study in order to receive a wider perspective of the population; the units matched the proportion of students at Umeå School of Business. To measure the statistical difference between the genders the authors used a statistical Chi2 test. They also found that there is a tendency among women to have a higher degree of risk aversion than men, as per the general consensus. This implies that women would take a lower risk when managing an investment portfolio.

Moreover, another interesting aspect of this topic is how parents' financial behavior and education pass on to future generations, depending on the gender. The work of Pahlevan, Ahadzadeh, Turner (2020) researched into the impact of gender on the intricate process by which family financial socialization molds the financial literacy and behavior of Malaysian young adults. The study, based on a cross-sectional survey of 572 participants from four major universities, uncovered that both parental teaching and behavior exert a direct influence on the financial behavior of young adults. Particularly among females, the influence of parental teaching, mediated through planned behavior, was pivotal in steering financial information-seeking behavior, subsequently shaping financial literacy. Additionally, a noteworthy negative association between parental teaching and financial literacy emerged among males.

These studies present just a glimpse of the multidimensional nature of gender-specific differences in risk attitudes, financial literacy, and financial behavior, showcasing the complex correlations between societal, cultural, and individual factors

**Mismanagement in Risk-Taking Behavior.** Another crucial perspective of the matter is the importance of a good risk management. Sjoberg (1999) offered conclusive evidence in favor of the theory that people may perceive completely distinct actions (irrelevant versus life-changing ones) as carrying roughly the same amount of risk, leading to individual risk mismatches (e.g., an individual who takes on excessive risk for his/her economic position), which could ultimately result in financial losses or worse. The paper's author makes the case that people desire for mitigating measures can be greatly affected by their perception of the risk attached to a certain activity. According to the author, people who believe there is a lot of risk involved in a certain activity or danger are more likely to seek mitigation steps to lessen their susceptibility to that risk. A theoretical examination of the connection between perceived risk and the desire for mitigation is presented at the outset of the study. The author creates a framework for comprehending that relationship by drawing on theories and literature already in the field of risk perception and management. The author then carried out an empirical experiment to collect information on the link between perceived risk and demand for mitigation in order to test and validate this approach. People in Sweden who were exposed to various dangers were

surveyed in order to gather data for this study. The poll asked about the perceived degree of risk related to various dangers and activities as well as the need for risk mitigation strategies to lower exposure to these risks. Regression analysis was one of the statistical techniques used to assess the link between risk perception and demand for mitigation using the survey data. This study's theoretical analysis and empirical research converged to provide the author a thorough grasp of the link between risk perception and demand for mitigation, which was then used to demonstrate that people often disassociate the level of self-perceived risk in relationship with the objective peril.

Finally, unveiled by MacCrimmon and Wehrung (1986), a particularly intriguing aspect, demanding further exploration, is the phenomenon of individuals' risk tolerance, especially their tendency to distort risk aversion when given the opportunity to self-assess their risk profile. The potential for misjudgment arises from their overconfidence and a common tendency to overestimate their risk preferences. Their study addresses three primary objectives. Firstly, it establishes a framework for comprehending risk-taking and utilizes this framework to examine managerial risk-taking behavior. Secondly, it introduces a Risk Portfolio featuring questionnaires designed to evaluate individuals' willingness to take risks. These questionnaires, grounded in theories from economics, finance, management, and psychology, provide a managerially oriented and well-founded approach. Responses to the Risk Portfolio questions generate an Individual Risk Profile for self-assessment and an Organizational Risk Profile for comparing risk dispositions within a firm. Overall, what this research uncovered serves as a valuable resource for understanding and assessing risk-taking behaviors in managerial contexts. Consequently, the pertinent question arises: What causes this disparity, and why do people make financial decisions based on their perceived risk tolerance rather than on their objectively observed risk appetite?

All things considered, it is evident that failing to recognize one's own risk aversion can have serious repercussions on one's financial and psychological well-being. It's critical that people take the time to comprehend their personal risk preferences and base their selections wisely in order to prevent these unfavorable effects.

### 3. METHODOLOGY

Our study employs a cross-sectional design, aiming to analyze the connection between risk attitudes, financial literacy and financial behavior across genders. This design allows for the collection of data at a single point in time, capturing a snapshot of the relationship between these variables.

**Participant Selection.** The study's sample consists of students who took the elective class of Personal Finance held in 2022. The total number of students surveyed was 119. However, after analyzing the data -removing duplicates and incomplete responses - only 52 students completed both questionnaires thoroughly, resulting in a response rate of approximately 44

To address potential concerns regarding the small sample size, we conducted a statistical analysis to justify its adequacy. Using the sample size calculation formula for a finite population:

$$n = \frac{Z^2 \cdot p \cdot (1 - p)}{e^2} \cdot \frac{N}{N - 1 + \frac{Z^2 \cdot p \cdot (1 - p)}{e^2}}$$

Where:

- $N = 119$  (population size),
- $Z = 1.645$  (for a 90% confidence level),
- $p = 0.5$  (estimated proportion of the population),
- $e = 0.10$  (10% margin of error).

We calculated the required sample size using the formula from Illustration 1 to be approximately 44 participants. Our actual sample size of 52 exceeds this requirement, ensuring that our study results are statistically sound and reliable despite the limited number of respondents.

Although we were not able to actively select participants by gender to obtain equal halves, the sample was fortunately split almost equally by gender, with 28 women and 24 men. Moreover, other participant-related variables such as age, educational background, and income can be assumed to exhibit very small variations, given that all participants were undergraduate finance students. As such, separate control variables were not included in the study. The incomplete answers were removed from the database, leaving only the complete responses for analysis.

**Financial Behavior & Investment Preferences.** At the beginning of the semester, students' were presented the first questionnaire which captured data on their financial behaviors, as well as their parents, evaluated the risk attitudes of participants, and ascertain their preferences regarding various financial products, including bank deposits & savings accounts, investment funds, stocks, bonds, life insurances and cryptocurency, as well as participants' primary sources of financial information.

The information about the financial behaviors of both the respondents and their parents was collected with the help of several questions to which students had to answer by choosing scores on a scale from 1 (never) to 5 (always) if they observed the following financial habits: expenditure tracking, revenues and expenditure planning, in-budget spending, saving and long-term investing. They were also questioned about the interaction with their parents such as whether parents have a good influence on their financial behavior, if they make their own financial choices based on parents' choices in similar situations, whether they consider their parents as role models when it comes to money management or if they discuss with their parents various household related financial matters. In addition, we asked respondents questions about their general behavior such as their ability to satisfy their needs and wants and being able to complete their plans. Each of these groups of questions were combined to create 3 new index-like variables: Financial Behavior, Parents-Children Interaction and General Behavior. These questions followed the methodology developed by Shim, Barber, Card, Xiao, Serido (2010). Their study determined parental socio-economic status (SES) using the CSI (Computerized Status Index) method and assessed parental financial behavior through students' perceptions. The CSI method involved factors like education levels of both parents and total household income. Students rated their parents' financial behaviors on a five-point scale, indicating the frequency of positive financial behaviors such as tracking expenses, budgeting, paying credit card balances in full, saving monthly, and investing for long-term goals. These same positive financial behaviors were also used as core domains for measuring parental subjective norms, students' financial attitudes, and behaviors. All obtained scores were normalized.

**Financial Literacy Assessment.** To gauge financial literacy, a validated assessment tool has been utilized. This tool encompasses various aspects of financial knowledge, including understanding financial terms, concepts, and application of financial principles in decision-making scenarios. The assessment aims to measure participants' proficiency in financial matters.

At the end of the Personal Finance course, all students were asked to complete the assessment questionnaire, with the incentive being their final grade improved by 1 point if they do complete it thoroughly. This second questionnaire consisted of 16 questions. Each of these were developed by or inspired from Lusardi and Mitchell (2014) and van Rooij, Lusardi and Alessie (2017) who have thoroughly studied the use of such questionnaires within similar case-studies. The first five questions were designed to assess fundamental/basic financial literacy skills, including numerical proficiency, the ability to perform interest rate calculations, and understanding concepts such as time-value of money and inflation. Furthermore, eleven questions were formulated to capture advanced financial knowledge, covering topics such as how the capital market works and the risk-return relationship regarding different popular financial assets (stocks and bonds, mutual funds, etc.).

**Risk Attitude Measurement.** Throughout the classical literature of finance, authors employed a diverse range of methods to evaluate risk aversion, recognizing its significance in contexts spanning from individual decision-making on investments to government policy choices. Surveys and questionnaires provide a scalable and cost-effective means of gathering data on individuals' risk preferences, although responses may be subject to framing effects. The question from the first survey aimed at capturing the participants' level of risk-aversion used the already-famous supposed lottery experiment approach, while the other one asked the participants to rate their risk attitude on scale. In order to assess the risk profile of respondents (the Objective Risk Attitude), we used the experimental method suggested by Hartog, Ferrer-i-Carbonell, and Jonker (2000), based on the Arrow-Pratt risk aversion coefficient (ARA) introduced by Arrow (1965) and Pratt (1964). The Arrow-Pratt Theorem is used to categorize different types of risk aversion and offers a framework for expressing the degree of aversion as an absolute (in dollars) or relative (in percentage terms) value. It is employed to ascertain the risk premium, or the highest revenue that an agent is prepared to give up in exchange for a risk-free allocation. Furthermore, it is an effective method for determining the risk preferences of various individuals and comprehending the ways in which various forms of risk impact the decision-making process. Specifically in our research, based on the questions related to what price students would pay to participate in a lottery whose winnings are uncertain, the risk aversion coefficient was calculated. Then, using those raw scores and the methodology specified above we calculated each individuals' risk premium. The results were normalized in such a way that the final scores tell us how risk-loving each participant is. The question used to collect raw data is the following: "Let's say you play take part in a lottery and you have a 10% chance of winning 1000 lei. The maximum price you would pay for your lottery ticket is: [Please Specify an Amount]". On the other hand, the question used to capture the Subjective Risk Attitude asks "Are you generally a risk taker or do you try to avoid it? Rate yourself from 1 (I don't take any risks) to 5 (I love risk) for the risk you would take in managing your personal finances!".

**Data Processing.** Data obtained through surveys and experimental tasks were analyzed to derive various statistics, providing insights into the relationship between financial literacy, risk attitudes, and financial behavior among the participants. All raw data was normalized so as it can be used during the processing stage. Descriptive statistics, such as means and standard deviations, were employed to summarize and present the central tendencies and variability of key variables, including respondents' financial literacy scores, risk attitudes levels, and preferences for various financial products. Furthermore, inferential statistics, such as correlation coefficients are utilized to examine the relationships between these variables, allowing for a more nuanced understanding of how financial literacy influences risk attitudes and subsequent financial decision-making. T-Test analyses, specifically the one assuming Unequal Variances, are crucial in identifying patterns, trends, and potential gender-specific disparities, contributing to a comprehensive interpretation of the study's findings.

#### 4. RESULTS AND INTERPRETATIONS

**Survey.** We collected data from 84 respondents for the first questionnaire, while only approximately 35 students responded to the second one. After removing the incomplete answers from both questionnaires, we were faced with an issue: some participants answered only the first questionnaire but not the second and vice-versa. Thus, we followed up on each participant who did not finish one or the other with the request of complete the survey, in order to get as many complete answers as possible. The sample is evenly distributed by gender (24 males to 28 females) with a total of 52 respondents, ensuring a representative exploration of gender-specific differences.

**Financial Literacy Scores.** Participants' financial literacy scores were assessed based on a comprehensive questionnaire comprising 16 questions categorized into basic and advanced financial literacy skills. The mean score for basic financial literacy was 83.49%, indicating a



good understanding of basic financial concepts. On the other hand, only about half of them – 47.62%, responded correctly to all basic financial questions. Alike the basic financial literacy, advanced financial literacy yielded an average score of 77.92%, reflecting that participants have a good grasp of more complex financial notions. However, only about 10.5% of them actually responded correctly to all advanced questions. Finally, the overall rate of correct completion for the entire questionnaire was, on average, about 80.89%, with only 6.35% of respondents getting only correct answers. These results shed light on the level of financial understanding of the sample, showcasing a high level of sophistication in understanding complex financial concepts. Table 1 summarizes the financial literacy scores.

TABLE 1. **Table 1:** Financial Literacy Scores

Question No.	% of Correct Answers	Average % of Correct Answers	% of Participants who Answered Correctly to all questions
Numeracy Skills	93.65%	<b>83.49%</b>	<b>47.62%</b>
Inflation	80.95%		
Compound Interest	73.02%		
Time Value of Money	79.37%		
Money Illusion	90.48%		
Stock Exchange	90.48%	<b>77.92%</b>	<b>10.50%</b>
Shares	95.24%		
Investment Funds	87.30%		
Bonds	88.89%		
Risk-Return Relationship	58.73%		
Risk-Return Relationship	79.37%		
Risk-Return Relationship	88.89%		
Bonds Maturity-Yield	36.51%		
Risk-Return Relationship	85.71%		
Diversifying Principle	96.83%		
Bonds Maturity-Yield	49.21%		
<b>Average Results</b>		<b>80.89%</b>	<b>6.35%</b>

Another observation worth mentioning are the outliers regarding questions used within the survey. Participants found most difficult understanding bonds at maturity (with only 36.51% answers' correctness) and the relation between bonds price and interest rate (with 49.21% correct answers). On the other hand, students have a very good understanding on the investment principle of diversifying the risk (with an average of 96.83% correct answers) and on how stocks are working (95.24% rate of correct answers). Interestingly, none of these outliers were part of the first five questions that assessed the basic financial literacy, indicating that participants do indeed have a higher level of understanding regarding more complex financial topics.

In addition to that, descriptive statistics show that men achieved an average financial literacy score of 84.63 mean points while women sit around 77.67. This 7 point difference is statistically significant to the 95% benchmark. Table 2 shows the statistics in this sense. The general high scores can be attributed to the fact that respondents were enrolled at a faculty specialized in Finance, thus familiarized, to an extent, with the topics in question. These findings bolster academic consensus on the matter (Lusardi and Mitchell, 2014; Atkinson and Messy, 2012) which state that men are usually more literate when it comes to financial knowledge.

TABLE 2. Financial Literacy Scores

Entire Sample	Women	Men
Mean: 80.8894 SD: 12.8274 Kurtosis: 1.3314 Skewness: -1.0799 Min: 37.5, Max: 100	Mean: 77.6786 SD: 14.8710 Kurtosis: 0.3872 Skewness: -0.6950 Min: 37.5, Max: 100	Mean: 84.6354 SD: 8.8348 Kurtosis: 1.8956 Skewness: -1.2006 Min: 62.5, Max: 100
<i>t-Test - P-Value Two Tail: 0.0429**</i>		

**Risk Attitudes.** The results show that for 2 variables of interest there is a significant difference in the mean of the sample groups. Table 3 summarizes the descriptive statistics and the t-Test for this purpose. With a 95% probability, the mean difference in Subjective Risk Attitude of approximately 10 points (men scored a mean of 54.16 while women a mean of 44.64) is statistically significant. This implies that men reckon their own risk appetite to be by about 10% higher, on average, than that of women's. However, it seems that this difference loses statistical significance when we are talking about the Objective Risk Attitude. Even though the mean difference is approximately the same between genders (21.42 for women and 30.43 for men), statistically speaking, there is no relevance. Basically, even if men express a higher risk-tolerance, they don't seem to act on it when confronted with an actual experiment that tests for one's risk-aversion. Even so, the fact that men self-assess their own risk-tolerance with a 10 point difference when compared to women reinforces the broader consensus that men are less risk-averse (Byrnes et al., 1999; Croson and Gneezy, 2009; Gu, Peng and Zhang, 2019; etc.).

These findings suggest a nuanced understanding of gender differences in risk attitudes. When employing an objective experimental method to evaluate financial risk (Hartog, Ferrer-i-Carbonell, and Jonker; 2000), a significant difference emerges between men and women, indicating variations in their propensity for risk-taking behavior. However, when utilizing self-assessment methods, in which participants might be subjected to different emotional considerations, the statistical significance of this difference diminishes. This implies that conclusions regarding men being inherently more risk-loving than women cannot be definitively drawn just yet, as the situation seems to be more complex. Moreover, while there may be discrepancies between how individuals perceive and objectively assess risk, these findings indicate that these discrepancies are relatively consistent across genders, even if the means differ. Consequently, it becomes challenging to assert that either men or women are better at evaluating their risk attitudes compared to the other gender.

**Financial & General Behaviors and Parental Interaction.** After analyzing financial behaviors and parental interaction variables, there are several distinct differences from one gender to the other. Table 4 reports the statistics. Perhaps one of the most contrasting differences between genders, as well as the most robust result in terms of significance (to the 99% benchmark) is the one of Long Term Investing, which suggests a meaningful difference in the habit of investing (specifically, how often do participants invest). With the difference of almost 27 points (35.41 for men and 8.92 for women), it is safe to assume that men do indeed invest on a more regular basis, although the scores are generally low, especially if we think that all respondents are students of economic studies.

Another variable that gained robust statistical significance (99% confidence level) throughout the analysis and which shows that men and women have distinct financial behaviors is Satisfying Wants which measures how easy it is for participants to satisfy their wishes. The results show that women (74.1 mean score) are better at satisfying their wants compared to men (54.16 mean score), yet the reasons behind why this is should be a topic for further scientific endeavor. Furthermore, General Behavior, one of the 3 index-like variables created within the study, which encompasses 3 variables by means of averaging them (Satisfying Wants, Satisfying Needs, Finishing Plans), gained statistical relevance to the 90% confidence interval. Once again,

TABLE 3. Descriptive Statistics &amp; T-Test: Unequal Variances Results for Objective, Subjective and Observed Risk Discrepancy Variables

Descriptive Statistics	Entire Sample	Women	Men
<b>Objective Risk</b>	Mean: 25.5843 SD: 29.0336 Kurtosis: -0.4798 Skewness: 0.8744 Min: 0, Max: 100	Mean: 21.4274 SD: 28.4117 Kurtosis: 0.4047 Skewness: 1.2627 Min: 0.352275, Max: 100	Mean: 30.4340 SD: 29.5966 Kurtosis: -0.8475 Skewness: 0.5512 Min: 0, Max: 100
	<i>t-Test - P-Value Two Tail: 0.2706</i>		
<b>Subjective Risk</b>	Mean: 49.0385 SD: 17.1224 Kurtosis: 0.5068 Skewness: 0.4293 Min: 25, Max: 100	Mean: 44.6429 SD: 15.7485 Kurtosis: -0.4305 Skewness: 0.1856 Min: 25, Max: 75	Mean: 54.1667 SD: 17.5491 Kurtosis: 1.0480 Skewness: 0.5790 Min: 25, Max: 100
	<i>t-Test - P-Value Two Tail: 0.0464**</i>		
<b>Observed Risk Discrepancy</b>	Mean: 23.4542 SD: 32.1936 Kurtosis: -0.2205 Skewness: -0.7356 Min: -50, Max: 75	Mean: 23.2155 SD: 32.4405 Kurtosis: -0.1847 Skewness: -0.7858 Min: -50, Max: 71.26044	Mean: 23.7327 SD: 32.5977 Kurtosis: -0.0256 Skewness: -0.7272 Min: -50, Max: 75
	<i>t-Test - P-Value Two Tail: 0.9546</i>		

it seems that women consider themselves to have a higher financial satisfaction overall, when compared to men with how they are spending their money in regards to the 3 sources from above, by about a 7,83 mean point difference (mean score for women: 61.35, mean score for men: 53.47).

Finally, there are multiple significant variables that highlight gender-based differences in the perception of parents as positive influences, role models in money management, and parent-child interaction in the financial context. Notably, we can assume, to some extent, that parents are perceived as good influence on self-financial behavior by their children. The difference in the perception of women to men is of approx. 17 mean points (relevant within a 90% confidence interval). Conclusively, women systematically perceive parents as positive influence on self-financial behavior more often than men do, averaging a score of 74.1, while men achieved a mean of 57.29. Additionally, parents are also perceived more often as role-models in money management by female offspring than by males. With a 95% confidence level, we can affirm that, despite the overall lower means for both genders (67.85 mean points for women and 48.95 mean points for men), the difference remains almost unchanged (18.9) when compared to the previous variable (16.81). Once more, women tend to have deeper roots within family relationships than men. This is not surprising, as Alan, Baydar, Boneva, Crossley, Ertac (2017) have discovered, female descendants are more influenced by parents' financial risk-aversion and education. Furthermore, they went so far to affirm that this correlation is only significant for daughters (and not for sons). This hypothesis is also reinforced by the last statistical significant variable of our analysis. This variable encompasses the interaction between parents and children and the results implies that, with a 90% confidence level, women scored a higher mean than men when it comes to the overall interactions with their parents regarding financial topics. Again, this has been discovered repeatedly with authors such as Pahlevan, Ahadzadeh, Turner (2020) who concluded that in case of females' offspring, parents' guidance and teachings, rooted

**Table 4: Descriptive Statistics & T-Test: Unequal Variances Results for Financial Behaviors and Parental Interaction Variables**

Descriptive Statistics	Entire Sample	Women	Men
<b>Expenditure Tracking</b>	Mean: 58.17308 SD: 30.80662 Kurtosis: -0.915 Skewness: -0.20456 Min: 0, Max: 100	Mean: 57.1429 SD: 31.0742 Kurtosis: -0.9529 Skewness: -0.0916 Min: 0, Max: 100	Mean: 59.3750 SD: 31.1138 Kurtosis: -0.7524 Skewness: -0.3529 Min: 0, Max: 100
	<i>t-Test - P-Value Two Tail: 0.7974</i>		
<b>Revenue &amp; Expenditure Planning</b>	Mean: 53.36538 SD: 30.1259 Kurtosis: -0.98394 Skewness: 0.011249 Min: 0, Max: 100	Mean: 52.6786 SD: 30.6860 Kurtosis: -0.9428 Skewness: 0.1702 Min: 0, Max: 100	Mean: 54.1667 SD: 30.0965 Kurtosis: -0.9364 Skewness: -0.1843 Min: 0, Max: 100
	<i>t-Test - P-Value Two Tail: 0.8609</i>		
<b>In-Budget Spending</b>	Mean: 79.80769 SD: 24.77272 Kurtosis: -0.39169 Skewness: -0.90668 Min: 25, Max: 100	Mean: 79.4643 SD: 25.5074 Kurtosis: 0.0402 Skewness: -1.0596 Min: 25, Max: 100	Mean: 80.2083 SD: 24.2728 Kurtosis: -0.8526 Skewness: -0.7597 Min: 25, Max: 100
	<i>t-Test - P-Value Two Tail: 0.915</i>		
<b>Saving Habit</b>	Mean: 53.36538 SD: 30.1259 Kurtosis: -0.66531 Skewness: -0.1286 Min: 0, Max: 100	Mean: 51.7857 SD: 30.3746 Kurtosis: -0.7544 Skewness: -0.0123 Min: 0, Max: 100	Mean: 55.2083 SD: 30.3773 Kurtosis: -0.3575 Skewness: -0.2760 Min: 0, Max: 100
	<i>t-Test - P-Value Two Tail: 0.6872</i>		
<b>Long-Term Investing</b>	Mean: 21.15385 SD: 28.60508 Kurtosis: 1.503622 Skewness: 1.456672 Min: 0, Max: 100	Mean: 8.9286 SD: 16.9617 Kurtosis: 7.6202 Skewness: 2.4787 Min: 0, Max: 75	Mean: 35.4167 SD: 32.9003 Kurtosis: -0.2536 Skewness: 0.7590 Min: 0, Max: 100
	<i>t-Test - P-Value Two Tail: 0.0011***</i>		
<b>Financial Behavior</b>	Mean: 53.17 SD: 16.69 Kurtosis: -0.54259 Skewness: 0.029741 Min: 15, Max: 90	Mean: 50.0000 SD: 16.4429 Kurtosis: -1.0607 Skewness: 0.2759 Min: 25, Max: 80	Mean: 56.8750 SD: 16.5380 Kurtosis: 0.6704 Skewness: -0.2587 Min: 15, Max: 90
	<i>t-Test - P-Value Two Tail: 0.1404</i>		
<b>Satisfying Wants</b>	Mean: 64.90385 SD: 30.62247 Kurtosis: -1.05543 Skewness: -0.29814 Min: 0, Max: 100	Mean: 74.1071 SD: 28.4492 Kurtosis: 0.1113 Skewness: -0.9000 Min: 0, Max: 100	Mean: 54.1667 SD: 30.0965 Kurtosis: -0.9364 Skewness: 0.3051 Min: 0, Max: 100
	<i>t-Test - P-Value Two Tail: 0.0183***</i>		
<b>Satisfying Needs</b>	Mean: 77.40385 SD: 23.87653 Kurtosis: 0.990959 Skewness: -1.04086 Min: 0, Max: 100	Mean: 78.5714 SD: 20.0858 Kurtosis: 0.3344 Skewness: -0.7346 Min: 25, Max: 100	Mean: 76.0417 SD: 28.0519 Kurtosis: 0.7729 Skewness: -1.0952 Min: 0, Max: 100

Descriptive Statistics	Entire Sample	Women	Men
	<i>t-Test - P-Value Two Tail: 0.7145</i>		
<b>Finishing Plans</b>	Mean: 30.76923 SD: 32.31864 Kurtosis: -0.7696 Skewness: 0.682956 Min: 0, Max: 100	Mean: 31.2500 SD: 31.6411 Kurtosis: -0.9746 Skewness: 0.5533 Min: 0, Max: 100	Mean: 30.2083 SD: 33.7664 Kurtosis: -0.4676 Skewness: 0.8578 Min: 0, Max: 100
	<i>t-Test - P-Value Two Tail: 0.9095</i>		
<b>General Behavior</b>	Mean: 57.69231 SD: 15.72903 Kurtosis: 1.503622 Skewness: 1.456672 Min: 15, Max: 90	Mean: 61.3095 SD: 16.8530 Kurtosis: 0.5058 Skewness: -0.4127 Min: 25, Max: 80	Mean: 53.4722 SD: 13.4408 Kurtosis: -0.7999 Skewness: -0.3451 Min: 15, Max: 90
	<i>t-Test - P-Value Two Tail: 0.0681*</i>		
<b>Parents as Good Influence of Self Financial Behavior</b>	Mean: 66.34615 SD: 31.26602 Kurtosis: -0.78204 Skewness: -0.55257 Min: 0, Max: 100	Mean: 74.1071 SD: 24.0391 Kurtosis: -0.8028 Skewness: -0.4632 Min: 25, Max: 100	Mean: 57.2917 SD: 36.4745 Kurtosis: -1.4369 Skewness: -0.1899 Min: 0, Max: 100
	<i>t-Test - P-Value Two Tail: 0.0611*</i>		
<b>Own Choices based on Parents' Choices in Similar Situations</b>	Mean: 45.19231 SD: 30.93259 Kurtosis: -0.94942 Skewness: -0.0709 Min: 0, Max: 100	Mean: 50.8929 SD: 30.0325 Kurtosis: -0.6095 Skewness: -0.2111 Min: 0, Max: 100	Mean: 38.5417 SD: 31.2591 Kurtosis: -1.1403 Skewness: 0.1153 Min: 0, Max: 100
	<i>t-Test - P-Value Two Tail: 0.1545</i>		
<b>Parents as Role Models in Money Management</b>	Mean: 59.13462 SD: 33.2212 Kurtosis: -0.98666 Skewness: -0.34982 Min: 0, Max: 100	Mean: 67.8571 SD: 29.5468 Kurtosis: 0.1762 Skewness: -0.8461 Min: 0, Max: 100	Mean: 48.9583 SD: 34.9527 Kurtosis: -1.1548 Skewness: 0.1843 Min: 0, Max: 100
	<i>t-Test - P-Value Two Tail: 0.0426**</i>		
<b>Parents-Children Financial Discussions</b>	Mean: 53.84615 SD: 34.43686 Kurtosis: -1.15008 Skewness: -0.10027 Min: 0, Max: 100	Mean: 57.1429 SD: 33.2340 Kurtosis: -1.0333 Skewness: -0.1622 Min: 0, Max: 100	Mean: 50.0000 SD: 36.1158 Kurtosis: -1.2570 Skewness: 0.0000 Min: 0, Max: 100
	<i>t-Test - P-Value Two Tail: 0.4644</i>		
<b>Parents-Children Interaction</b>	Mean: 56.12981 SD: 27.18656 Kurtosis: -0.82094 Skewness: -0.33729 Min: 0, Max: 100	Mean: 62.5000 SD: 23.9357 Kurtosis: -0.3783 Skewness: -0.3323 Min: 12.5, Max: 100	Mean: 48.6979 SD: 29.3139 Kurtosis: -1.3134 Skewness: -0.1327 Min: 0, Max: 93.75
	<i>t-Test - P-Value Two Tail: 0.0725*</i>		

in planned behavior, played a significant role in shaping their children's financial information-seeking behavior. For all other features that were examined, there were no observed significant differences between men and women.

**Investment Preferences & Information Sources.** Furthermore, participants demonstrated distinct preferences for various financial products, providing a nuanced understanding

of their financial behaviors. Survey responses revealed that an almost equal percentage of both male and female participants favored bonds as an investment - 42.86% for women and 45.83% for men, from the total sample number per gender – 28 and 24 respectively. However, this is where the similarities end, as for the other investment options, each gender’s preferences diverge. Interestingly, the biggest percentage difference between genders is shown in terms of how many women (35.71%) prefer to invest in bank deposits as compared to men (12.50%), with a staggering difference of 23.21%, indicating a visible propensity of women towards lower-risk instruments, as compared to men. Conversely, male respondents exhibited a preference for more dynamic investments, including investment funds (66.67%) and stocks (83.33%) compared to their female counterparts (67.86% for stocks and 42.86% for mutual funds), suggesting a willingness to embrace higher levels of risk for potentially greater returns.

One can notice that, on average, the difference in percentage points between male to female investment preferences is of approx. 20% for the previously mentioned investment options (15.47% difference for stocks and 23.81% for investment funds). Notably, the most interest across both genders was expressed for stock, signifying that participants favor riskier but high-returns investments over safer ones, even if there is a significant difference in the risk appetite of women compared to men. Lastly, the least popular investment option, when looking at the entire sample, is represented by investment in cryptocurrencies such as Bitcoin. 20.83% of males would invest in such an option while only 3.57% of female respondents consider BTC as a viable investment option (that is only 1 out of the total 28 female respondents). However, it is worth mentioning that, even if the overall average places Bitcoin as the least investable option, it’s not true for both genders in absolute terms – for men, the most unpopular category was bank deposits/savings accounts, with 12.5% of male respondents choosing it as a would-be investment (3 out of 24 total male respondents). Conclusively, the observed trend is that women prefer lower-risk investments compared to men, if they choose to invest at all, as the overall participation of women is clearly lower for almost all investment options except the bank deposits/savings accounts.

As for the primary sources of financial information of the sample group, there is still no consensus among genders. For men, the go-to source of financial notions is represented by the specialized books and courses, while for women this source is preferred by only about 14.29% of them. Seemingly, the most popular source of financial information for women is represented by media (online and offline) with 46.43% of them choosing this as their primary option. Interestingly, men do not differ very much in this aspect, with 41.67% of them choosing this source as their favorite. However, 39.29% of women prefer getting their financial information from friends and family, compared to only 4.17% of men. This striking difference proves that women put more emphasis on the peer interactions than their counterpart, who prefer a more specialized yet objective source.

TABLE 5. Respondents’ Investment Preferences & Sources of Information across Genders

Statistics	Women	Men
Source of information: specialized books/courses	14.29%	54.17%
Source of information: my family and friends	39.29%	4.17%
Source of information: media (TV, internet, newspapers, radio, social networks, forums)	46.43%	41.67%
% invest in Shares	67.86%	83.33%
% invest in Bonds	42.86%	45.83%
% invest in Bank Deposits/Savings Accounts	35.71%	12.50%
% invest in Mutual Funds	42.86%	66.67%
% invest in BTC	3.57%	20.83%

These statistics underscore the diverse financial inclinations within this group, emphasizing the need for tailored financial education programs and investment strategies that cater to the varied risk appetites and long-term planning perspectives observed among educated individuals.

**Correlation Matrices: Entire Sample.** In order to illustrate the complex correlations between the sample's subjective risk attitudes, objective risk attitudes, observed risk attitudes discrepancy, financial literacy, and the other factors included within the survey, we constructed a correlation matrix (see Table 6 below). Pearson correlation coefficient measures how well the relationship between two variables can be described by a straight line. When the coefficient is positive, it indicates a positive correlation, meaning that as one variable increases, the other tends to increase as well. A negative coefficient signifies a negative correlation, suggesting that as one variable increases, the other tends to decrease. Additionally, due to the limited sample size and the potential deviation from normal distribution assumptions, Kendall's Correlation coefficient has been utilized as a more appropriate alternative to the Pearson's coefficient in our analysis. Kendall Tau coefficient is often used when dealing with ordinal data or when the assumption of linearity in the relationship between variables is not met. It is less sensitive to outliers compared to the Pearson correlation coefficient and is suitable for a wider range of data types. We used both coefficients to ensure the robustness and reliability of our correlation analysis given the small sample size.

Among the noteworthy trends is a positive association between both respondents' long-term investing habit and their parents' and the subjective risk attitude they manifested, indicating that those participants who manifest the habit of investing on long-term (or whose parents did) consider themselves as more risk lovers than the others. This correlation is weak (approx. 0.32 for both variables) but is statistically significant to the 95% confidence interval when calculating using both coefficients. Interestingly, these 2 variables are the only variables that correlate with Subjective Risk.

Objective risk, on the other hand, interacts with more variables than just Long-Term Investing, for which the correlation is weaker than in the previous case, both in term of magnitude – 0.24, and statistical relevance – to the 90% confidence benchmark, only when using Pearson's coefficient. From an economic standpoint, the higher the objective risk of oneself, the more he/she will invest on the long term. These results are indeed interesting, as it shows that participants who have the habit of long-term investing are subjectively/objectively more risk-averse than the others. A possible explanation could be that, despite the higher level of risk-tolerance of those respondents, they prefer investments which favor a lower level of uncertainty with a predictable outcome and a longer maturity period over riskier short-term gains.

Objective risk is also negatively correlated with variables "Parents-Children Financial Discussions" (-0.28 at the 95% confidence interval), "Choices based On Parents' Choices in Similar Situations" (-0.25 at the 90% confidence interval) and "Parents-Children Interaction" (-0.27 at the 95% confidence interval), calculated using both correlation coefficients. This suggests higher observed risk-taking behavior may be associated with poorer financial communication in families or vice versa, that the more parents communicate with children on financial topics, the more their appetite for risk will objectively decrease. These findings are in line with the classical literature which states that the more financially informed an individual is, the less risk-averse it becomes in his/her financial endeavors (see Gu, Peng & Zhang, 2019). Lastly, only when calculating using Kendall Tau coefficient, Objective Risk turns out to be weakly negatively correlated with the variable "Parents as Role Models in Money Management" (-0.15 at the 90% confidence interval). It appears that the more parents are seen as role model in money management, the lower the subjects' objective risk and vice versa.

Furthermore, except for "Parents as Role Models in Money Management", the 3 discussed variables retain their statistical significance (calculated with both correlation methods) with regards to the third variable of interest — the Observed Risk Discrepancy. Remarkably, for all variables the difference is that the direction of the correlation switches from indirect to direct,

while the magnitude remains weak (Parents-Children Financial Discussions with 0.30, Parents-Children Interaction with 0.32, and Choices Based on Parents' Choices in Similar Situations with 0.28). Thus, it seems the more parents interact with children on financial topics and matters, the higher the observed risk discrepancy becomes. One possible explanation for this might be that, having interacted/discussed before with/on financial topics, participants could develop a false sense of confidence on such matters. This false sense of understanding is proven by the existence of this risk discrepancy while taking financial decisions, based on his/her own pre-stated risk-aversion and the actual risk-taking behavior implied by his/her choice. However, unlike the previous case, there are two extra variables that become statistically relevant to the 90% threshold in regards to the observed risk gap. With a weak positive correlation coefficient of 0.23 and 0.26 respectively, variables "Parents as Good Influence of Self Financial Behavior" and "Parents as Role Models in Money Management" might signify that the more respondents try to copy their parents' financial decisions, the higher the risk discrepancy becomes. This, in turn, could be because of their parents' own risk mismanagement and how it was passed down from generation to generation, as proven by the academic literature (Hryshko et al., 2011; Dohmen et al., 2008; Stoian et al., 2021; Pahlevan, Ahadzadeh, Turner, 2020).

The application of Kendall's coefficient, considering its robustness in non-normal distributions and small sample sizes, reveals some alterations in the correlations between variables. Although, for the most part, the results have not changed, neither in terms of significance, direction nor magnitude, some notable differences did arise. "Parents Long-Term Investing" exhibited a significant positive correlation with "Subjective Risk," but this significance diminishes in the Kendall correlation matrix. This suggests a more nuanced relationship between these variables when assessed using Kendall's coefficient, potentially indicating a weaker association than initially perceived through Pearson's coefficient. Another such instance is the correlation between "Parents-Children Financial Discussions" and "Objective Risk" loses its significance when assessed using Kendall's coefficient. As for the other results obtained with Pearson's correlation coefficient, quite a few lost their statistical significance to the 95% threshold but remained significant at the 90% one. This underscores the sensitivity of correlation analyses to the choice of coefficient, emphasizing the importance of considering alternative measures, particularly in studies with limited sample sizes and non-normal distributions.

**Table 6: Correlation Matrix using Pearson & Kendall Tau Correlation Coefficients**

Factors	Pearson Correlation Coefficient			Kendall Tau Correlation Coefficient		
	Subjective Risk	Objective Risk	Observed Risk Discrepancy	Subjective Risk	Objective Risk	Observed Risk Discrepancy
Parents Revenue & Expenditure Planning	0.0042	0.1757	-0.1562	0.0226	0.0716	-0.0875
	0.9763	0.2129	0.2689	0.7867	0.427	0.343
Parents Expenditure Tracking	-0.0627	0.1901	-0.2048	-0.0452	0.0513	-0.0958
	0.6589	0.177	0.1453	0.5821	0.5713	0.299
Parents In-Budget Spending	0.2023	-0.0191	0.1248	0.1252	-0.0302	0.0762
	0.1503	0.8933	0.378	0.106	0.7292	0.3864
Parents Saving Habit	0.105	0.0244	0.0338	0.0732	-0.0271	0.0754
	0.459	0.8638	0.8117	0.3735	0.7689	0.4174
Parents Long-Term Investing	0.3248**	-0.0732	0.2388*	0.1456*	-0.0641	0.1184
	0.0188	0.6059	0.0882	0.0549	0.4467	0.1678
Parents Behavior	0.1482	0.0933	-0.0053	0.0792	-0.0045	0.0158
	0.2945	0.5107	0.9702	0.3463	0.9673	0.873
Parents-Children Financial Discussions	0.0895	-0.2833**	0.3031**	0.0422	-0.2127**	0.1817*



Factors	Pearson Correlation Coefficient			Kendall Tau Correlation Coefficient		
	Subjective Risk	Objective Risk	Observed Risk Discrepancy	Subjective Risk	Objective Risk	Observed Risk Discrepancy
	0.5279	0.0418	0.0289	0.6119	0.0189	0.0504
Parents as Role Models in Money Management	0.1019	-0.2	0.2346*	0.04	-0.1569*	0.1471
	0.4722	0.1551	0.0941	0.6309	0.0832	0.1132
Choices Based on Parents' Choices in Similar Situations	0.1068	-0.2574*	0.2889**	0.0724	-0.1848**	0.2142**
	0.4511	0.0654	0.0378	0.377	0.0399	0.02
Parents as Good Influence of Self Financial Behavior	0.1673	-0.1927	0.2627*	0.0958	-0.1282	0.1584*
	0.2359	0.1711	0.0599	0.2401	0.1536	0.0851
Parents-Children Interaction	0.138	-0.2794**	0.3254**	0.0739	-0.2127**	0.2225**
	0.3294	0.0448	0.0186	0.379	0.0211	0.0186
Finishing Plans	0.0767	-0.1206	0.1495	0.0581	-0.0498	0.0732
	0.5891	0.3945	0.2901	0.4738	0.579	0.4239
Satisfying Wants	0.0957	-0.0448	0.0913	0.0294	-0.0083	0.0324
	0.4998	0.7524	0.5197	0.7229	0.9327	0.7291
Satisfying Needs	0.0746	0.0273	0.0151	0.0656	-0.1048	0.1003
	0.5991	0.8478	0.9154	0.4086	0.2297	0.2622
General Behavior	0.1493	-0.0876	0.1584	0.1011	-0.0656	0.083
	0.2906	0.537	0.262	0.2223	0.4749	0.3769
Revenue & Expenditure Planning	-0.1124	0.0188	-0.0767	-0.0701	-0.046	-0.0158
	0.4276	0.895	0.589	0.3937	0.6144	0.8699
Expenditure Tracking	-0.008	0.07	-0.0674	-0.0219	-0.0083	-0.0173
	0.9549	0.6221	0.6351	0.7955	0.9332	0.8572
In-Budget Spending	-0.0467	0.0228	-0.0454	-0.0121	-0.0173	-0.0347
	0.7425	0.8726	0.7494	0.8829	0.8448	0.696
Saving Habit	-0.1362	-0.023	-0.0517	-0.0762	-0.0573	0.046
	0.3358	0.8716	0.7158	0.3508	0.5262	0.6208
Long-Term Investing	0.3176**	0.2476*	-0.0544	0.1297*	0.1342	-0.0392
	0.0218	0.0768	0.7017	0.0924	0.1145	0.6572
Financial Behavior	0.0023	0.116	-0.1034	-0.0136	-0.003	-0.0121
	0.987	0.413	0.4659	0.8776	0.9804	0.9045
Financial Literacy	0.1379	0.0588	0.0203	0.0875	0.0294	0.0173
	0.3297	0.6787	0.8865	0.2876	0.7503	0.8574

**Correlation Matrices: Investment Preferences.** Lastly, we have developed a correlation matrix between the respondents' preferred investment option and the objective and subjective risk, financial literacy, risk discrepancy, source of information, the variables that measure the financial behavior of respondents and their parents and those variables that measures the interaction between these 2 groups, using the Point-Biserial correlation coefficient, with results listed in Table 7. This correlation coefficient is a measure of the strength and direction of the relationship between a continuous variable, in our case the explanatory variables like Objective Risk, Subjective Risk, Long-Term Investing, etc., and a binary variable such are our investment option variables – Stocks, Bonds, Mutual Funds, Bitcoin and Bank Deposits. The point-biserial correlation coefficient is calculated similarly to the Pearson correlation coefficient, but it is specifically designed to handle the situation where one of the variables is dichotomous.

First of all, there is a weak positive correlation between objective risk and bonds (0.1386) which indicates that individuals tend to allocate a greater proportion of their investment portfolio to bonds as objective risk increases and individuals become more risk-tolerant. This result is accurate to the 95% statistical threshold. Contrary to initial impressions, this correlation

actually suggests a risk-averse investment behavior. One possible explanation could be that, as objective risk perceptions heighten and individuals become more risk-tolerant, they exhibit a preference for safer investment options such as bonds. This inclination towards bonds reflects a strategic response to mitigate the perceived risks associated with higher levels of objective risk, seeking the stability and income-generating potential offered by bond investments. Therefore, this correlation underscores the rational decision-making of respondents in adapting their investment allocations to navigate and manage changing levels of perceived risk within their portfolios.

Secondly, the moderate positive correlation between financial literacy and bonds (0.311) indicates that individuals with higher levels of financial literacy exhibit a greater propensity to invest in bonds. This finding underscores the role of financial education in shaping investment decisions, as individuals with enhanced financial knowledge may better appreciate the risk-return profile of bond investments and incorporate them into their portfolios. This result is accurate to the 95% statistical threshold.

Furthermore, Gender exhibits a weak positive correlation with mutual funds (0.2381) and bitcoin (0.2694), suggesting that male respondents may exhibit a slightly higher inclination towards investing in mutual funds and bitcoin compared to their female counterparts. Additionally, there is a weak negative correlation between gender and bank deposits (-0.2673), implying that male respondents are slightly less inclined to invest in bank deposits. These results are statistically significant to the 90% threshold. These findings align to the overall findings of this research, as it is clear that men, in general, exhibit a higher risk-tolerance than women, which directly translates to them preferring investment opportunities with higher yield and underlying risk.

Another statistically significant result to the 90% threshold is shown by the variable Parents Saving Habit, which is weakly negatively correlated (-0.2326) to mutual funds, showing that respondents whose parents have the habit of saving invest less in mutual funds than those respondents whose parents do not. This finding may be interpreted through several economic lenses. Firstly, it could reflect the influence of parental financial attitudes and practices on the financial behaviors of their offspring. Parents who prioritize saving may instill similar values in their children, leading them to adopt more conservative investment strategies and avoid the perceived risks associated with mutual funds. Secondly, it might indicate a preference for familiar or traditional investment avenues among individuals raised in households where saving is emphasized. These individuals may feel more comfortable following the financial practices modeled by their parents, favoring saving over potentially riskier investment options like mutual funds. Moreover, the negative correlation may also highlight the role of risk perception and financial literacy influenced by parental behaviors. Individuals whose parents prioritize saving may perceive mutual funds as too volatile or complex, opting instead for safer savings instruments. Alternatively, they may lack exposure or understanding of investment opportunities beyond traditional saving methods, leading them to favor familiar approaches inherited from their parents.

On the same note, it seems that Bitcoin is moderately negatively correlated with Parents as Role Models in Money Management (-0.3290) and weakly negatively correlated with Parents as Good Influence of Self Financial Behavior (-0.2393). Thus, it seems that participants who view their parents as more of a role models in terms of money management and financial behavior are less inclined to invest in high-risk assets such as Bitcoin and cryptocurrencies. From an economic standpoint (and implying good judgement on participants' side), it makes sense, as those high-risk investments are generally considered more of a gamble than a sensible investment.

Some other statistical significant results are between Satisfying Wants which is weakly negatively correlated to mutual funds (-0.2322) and weakly positively correlated to Bitcoin (0.2815). The negative correlation between Satisfying Wants and mutual funds suggests that individuals may be less inclined to invest in mutual funds when they feel they have adequately satisfied their

discretionary desires, potentially preferring immediate gratification over long-term investment. Conversely, the positive correlation with Bitcoin indicates a tendency for individuals to invest in more speculative assets after fulfilling their immediate wants, suggesting a certain level of risk-taking behavior. Moreover, there is a statistically significant moderate positive correlation between Satisfying Needs and bank deposits (0.3020) highlighting the preference for safe and liquid investments when addressing essential needs, underscoring the role of bank deposits in maintaining financial stability and security. These findings emphasize the interplay between individual financial behaviors, investment decisions, and the satisfaction of both discretionary wants and essential needs.

An unexpected result is the weak positive correlation between expenditure tracking and Bitcoin (0.2485) which might imply that individuals who are meticulous in monitoring their expenses are also more likely to invest in Bitcoin. This could be interpreted in a few ways. Firstly, it may indicate that individuals who are diligent in tracking their expenditures are also proactive in seeking out alternative investment opportunities, including more speculative assets like Bitcoin. They may be more open to exploring emerging financial markets and technologies as part of their broader financial strategy. Alternatively, it could suggest that individuals who track their expenditures are more financially savvy or informed, recognizing the potential growth opportunities presented by cryptocurrencies like Bitcoin. Overall, a positive correlation between expenditure tracking and Bitcoin highlights the diverse approaches individuals take in managing their finances and exploring investment avenues. This result is statistically robust to the 90% threshold.

The moderate positive correlation between long-term investing and bonds (0.2918) underscores the inclination of participants towards a prudent and conservative investment approach. As individuals prioritize long-term investment objectives, they exhibit a preference for asset classes like bonds, known for their stability and income-generating potential, aligning with the principles of risk diversification and wealth preservation over time. Furthermore, there is also a moderate positive correlation between bank deposits and In-Budget Spending (0.3394) suggesting a prudent and disciplined approach to personal finance. Respondents who prioritize maintaining bank deposits tend to also exhibit responsible financial behavior by adhering to budgetary constraints. This correlation implies that those who diligently save and allocate funds to bank deposits are also likely to conscientiously manage their expenses within their budgetary limits. It reflects a pattern of financial discipline and foresight, where individuals prioritize both saving for the future through bank deposits and managing their current expenses within predefined budgets.

Finally, we can see a pattern emerging. The moderate negative correlation (-0.2891) between financial behavior and mutual funds (as well as almost every other significant variable revealed by our analysis and mutual funds) highlights the nuanced relationship between individual financial dispositions and participation in such markets. This pattern shows that individuals exhibiting good financial behaviors such as saving, budgeting or revenue/expenditure planning habits display a reduced propensity to engage in mutual fund investments, which may be indicative of poor understanding of such investment opportunities or the general investment preferences and philosophies within the broader financial landscape in regards to mutual funds. This might be explained by lack of popularity of the product itself or its recent yield. This result is accurate to the 95% statistical threshold.

**Table 7: Correlation Matrix using Point-Biserial Correlation Coefficient**

Factors	Stocks	Bonds	Bank Deposits	Mutual Funds	Bitcoin
Objective Risk	0.0714	0.1386**	0.0122	-0.0686	-0.1257
	0.6722	0.0248	0.6722	0.2598	0.1213

Factors	Stocks	Bonds	Bank Deposits	Mutual Funds	Bitcoin
Subjective Risk	0.2292	0.0505	-0.0327	0.0612	0.1092
	0.1022	0.7222	0.8178	0.6662	0.4408
Financial Literacy	-0.0601	0.311**	0.0601	-0.1591	0.2176
	0.6722	0.0248	0.6722	0.2598	0.1213
Observed Risk Discrepancy	0.0575	-0.0982	-0.0285	0.0944	0.1715
	0.6854	0.4887	0.8413	0.5055	0.2242
Gender	0.1782	0.0299	-0.2673*	0.2381*	0.2694*
	0.2063	0.8335	0.0554	0.0892	0.0535
Parents Revenue & Expenditure Planning	-0.1808	-0.1714	-0.0947	-0.0805	0.0664
	0.1997	0.2242	0.5043	0.5704	0.6400
Parents Expenditure Tracking	-0.1679	0.0473	-0.1343	-0.1773	-0.0105
	0.2340	0.7391	0.3423	0.2086	0.9411
Parents In-Budget Spending	0.0097	-0.1758	0.1451	-0.0569	0.1271
	0.9457	0.2126	0.3048	0.6888	0.3694
Parents Saving Habit	-0.1034	-0.0555	0.1379	-0.2326*	-0.0144
	0.4656	0.6960	0.3296	0.0970	0.9194
Parents Long-Term Investing	0.1315	0.0658	0.1517	-0.0378	0.0696
	0.3529	0.6431	0.2830	0.7900	0.6240
Parents Behavior	-0.0992	-0.0824	0.0483	-0.1707	0.0631
	0.4841	0.5614	0.7337	0.2264	0.6566
Parents-Children Financial Discussions	-0.0651	-0.1004	-0.1953	-0.0935	-0.0407
	0.6465	0.4787	0.1652	0.5095	0.7744
Parents as Role Models in Money Management	-0.1772	-0.1296	0.1097	-0.1240	-0.3290*
	0.2089	0.3599	0.4389	0.3811	0.0173
Choices Based on Parents' Choices	-0.0544	-0.2078	0.1269	-0.2083	-0.0907
	0.7019	0.1393	0.3702	0.1384	0.5226
Parents as Good Influence	-0.1614	0.0301	0.0538	-0.1965	-0.2393*
	0.2531	0.8325	0.7049	0.1627	0.0876
Parents-Children Interaction	-0.1366	-0.1219	0.0232	-0.1832	-0.2080
	0.3342	0.3895	0.8703	0.1935	0.1390
Finishing Plans	0.1388	-0.1000	-0.0347	-0.0139	0.0289
	0.3266	0.4804	0.8071	0.9221	0.8387
Satisfying Wants	-0.1291	0.1551	0.1761	-0.2322*	0.2815**
	0.3616	0.2723	0.2118	0.0977	0.0432
Satisfying Needs	-0.2288	-0.0546	0.3020**	-0.2128	-0.2271
	0.1028	0.7005	0.0295	0.1298	0.1054
Behavior	-0.1188	-0.0255	0.2613*	-0.2651*	0.0149
	0.4016	0.8576	0.0613	0.0575	0.9167
Revenue & Expenditure Planning	-0.0465	0.0293	-0.1396	-0.2511*	0.2115
	0.7433	0.8365	0.3238	0.0725	0.1324
Expenditure Tracking	0.1183	-0.0799	-0.2275	-0.1945	0.2485*
	0.4037	0.5732	0.1049	0.1670	0.0756
In-Budget Spending	-0.1584	0.0622	0.3394**	-0.1724	0.1132

Factors	Stocks	Bonds	Bank Deposits	Mutual Funds	Bitcoin
	0.2621	0.6612	0.0138	0.2218	0.4241
Saving Habit	-0.0465	-0.0031	0.0465	-0.2511*	-0.0407
	0.7433	0.9825	0.7433	0.0725	0.7743
Long-Term Investing	0.1960	0.2918**	-0.1176	0.0445	0.1022
	0.1638	0.0358	0.4065	0.7540	0.4711
Financial Behavior	0.0302	0.0985	-0.0571	-0.2891**	0.2220
	0.8315	0.4874	0.6876	0.0377	0.1136

## 5. CONCLUSIONS

This study looked into the financial literacy and behavior of a sample of 52 students of economics that took the facultative course of Personal Finance. The aim of this study was to conduct a thorough examination, synthesis, and critical analysis of the dimensions surrounding gender-specific disparities in risk attitudes, financial literacy, and financial behavior. The investigation extended to factors encompassing parental influence on respondents, examining its impact on their financial behavior, choices, and preferences.

The study found that participants demonstrated a commendable grasp of basic financial concepts, with an average correctness rate of 83.49%, although understanding slightly declined in more intricate scenarios, reflected in an average score of 77.92%. Notably, they exhibited higher competency in straightforward investment principles, with an average correctness rate of 80.89%, indicating sound financial literacy but challenges in comprehending complex topics like market dynamics and bond pricing.

Gender-specific differences were consistent across various financial behavior variables. Men perceived higher risk appetites than women, and financial literacy scores were higher for men. Long-term investing behaviors were more common among men, while women displayed greater satisfaction with their spending habits.

Participants perceived parents as positive influences in money management, particularly women, aligning with prior research (Alan, Baydar, Boneva, Crossley, Ertac; 2017), emphasizing the significant role of parental guidance in shaping financial attitudes. Women scored higher in parent-child interactions on financial topics, emphasizing the influential role of parental guidance, particularly among female offspring, echoing conclusions from studies like Pahlevan, Ahadzadeh, Turner (2020).

Moreover, when it comes to the risk-aversion itself, our findings align with the scientific consensus: on average, women registered higher scores than men, irrespective of the type of risk measured (the objectively measured one or the self-assessed one). This comes as no surprise as most of the academic literature back these findings (Gu, Peng & Zhang, 2019; Croson and Gneezy, 2009; Byrnes et al., 1999; Hryshko et al., 2011; Stoian et al., 2021; etc.).

The correlation matrix analysis highlights significant connections among subjective risk, objective risk, observed risk discrepancy, financial literacy, and survey variables. Participants who engage in long-term investing tend to perceive themselves as less risk-averse. Objective risk is negatively correlated with financial communication in families but positively associated with long-term investing. Increased parental interaction correlates with a higher observed risk discrepancy, suggesting parental influence on risk perception. Moreover, emulating parents' financial choices may contribute to a higher risk discrepancy, in line with existing literature on intergenerational financial behavior patterns.

Additionally, the correlation matrix reveals noteworthy relationships between financial behavioral factors and investment preferences. There's a weak positive correlation between objective risk and bonds, indicating a preference for stability with increasing risk. Financial literacy is moderately correlated with bonds, reflecting the influence of education on investment decisions and aligning with principles of risk understanding. Gender differences emerge, with

males showing a higher inclination towards riskier investments like mutual funds and Bitcoin compared to females, who prefer lower-risk options like bank deposits. Further analysis unveils intriguing patterns, such as the positive correlation between expenditure tracking and Bitcoin, suggesting that meticulous financial management may coincide with a propensity for alternative investments like cryptocurrencies. Similarly, the moderate positive correlation between long-term investing and bonds indicates a preference for stability over time, aligning with risk-averse investment philosophies. The correlation between bank deposits and in-budget spending highlights disciplined financial behavior.

Our study enhances the academic literature by employing a robust methodology on a unique sample of students enrolled in a specialized Personal Finance course, thereby introducing novel insights into financial behavior and decision-making within this distinct demographic. Furthermore, the outcomes of this study underscore the importance of ongoing efforts to enhance financial education. Policymakers, educators, and financial institutions can leverage these insights to tailor interventions and educational programs, fostering a more equitable and comprehensive understanding of financial matters. Although we did not find direct evidence to support this hypothesis in our experiment, the existing literature concludes that, by improving financial education of the people, the risk-mismanagement will diminish (Stoian et al., 2021), thus improving general welfare. As we live in an ever-evolving financial landscape, the quest for heightened financial literacy remains a critical pursuit for empowering individuals to make informed and effective financial decisions.

Several limitations might be inherent in the study, including potential biases in self-reported data, the possibility of limited generalizability due to the specific demographic of the sample, and the challenges in capturing all aspects of financial behavior within the experimental setting. Even so, the soundness of the methodology should provide a stable ground for repeating the experiment in the future on a broader sample, or even multiple samples in a comparison manner.

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