Gender and Financial Knowledge

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Abstract

Financial knowledge is amongst the list of basic knowledge a person should have in order to secure a desirable standard of living. Hence governments across the world see it as an important issue. In most developing economies, gendered differences exist in both the knowledge of and access to financial products and services. Hence this paper aims to explore the relationship between gender and financial knowledge. We did this through an online survey amongst individuals in the Delhi NCR region, assessing their financial knowledge in both objective and subjective terms. The relationship between the objective and subjective scores is tested through correlation which shows a weak correlation between the two variables. Then a two-tailed independent t-test is conducted on both objective and subjective scores respectively to determine whether a meaningful difference exists in the respective scores based on the gender of the respondent. The objective score's mean for males and females did not show any significant difference. However, on average the subjective scores of females are lower than males. The findings indicate that women's perception of their own financial knowledge level is lower as compared to men. The results show that even in an educated sample of the population, with no prominent gender gap in objective financial knowledge, the participants still have a gender based gap in their subjective perception of their knowledge. Further, it also highlights that a high level of objective knowledge may not correlate with a high subjective score. Thus increasing women's subjective financial knowledge may need interventions other than those targeting to increase objective financial knowledge.

Keywords: Financial knowledge, Subjective financial knowledge, Objective financial knowledge, Gender, Financial literacy

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1. Introduction

In a country like India with deep-rooted patriarchal attitudes, gender bias remains a real concern, making it imperative to view the issues related to finance from a gendered lens. Financial literacy levels are of concern to every economy. In India, even though financial literacy levels have been rising over the years, further efforts are needed to improve female financial literacy (Reserve Bank of India, 2020). Financial literacy is defined as "knowledge and understanding of financial concepts and risks, and the skills, motivation and confidence to apply such knowledge and understanding to make effective decisions across a range of financial contexts, to improve the financial well-being of individuals and society, and to enable participation in economic life" (OECD, 2014). Financial literacy is a broad concept, and one of its components is financial knowledge. Financial knowledge measures the ability to understand financial calculations, specifically the implications of interest rates, inflation, and the risk and return on financial securities (Kadoya and Khan, 2020). This paper aims to explore the relationship between gender and financial knowledge. The concept of financial knowledge is studied by further bifurcating it into two aspects: objective and subjective (Robb and Woodyard, 2011). The objective financial knowledge is the actual extent of understanding and knowledge a person has pertaining to basic financial concepts and products. Whereas subjective financial knowledge refers to how individuals personally perceive their understanding of financial matters and how they assess their own level of financial knowledge. An individual's confidence level significantly influences their financial choices. These choices, in turn, impact overall financial well-being, which is the ultimate goal of having financial knowledge. Thus, it is crucial to consider one's subjective financial knowledge. Hence, this research aims to explore the relationship between objective and subjective financial knowledge an individual has, and how the subjective financial knowledge differs with the gender of the person. By highlighting these nuances, this paper adds to the wider conversation on financial literacy and stresses the importance of specialized interventions that extend beyond standard practices to address the unique gender-related challenges faced in navigating the financial landscape.

The structure of the rest of the paper is as follows. Section 2 summarizes the existing literature on the topic. Section 3 discusses the methodology used in the paper. Section 3 covers the result of the survey and its analysis. Finally, section 4 concludes the paper.

2. Literature Review

The broader concept of gender and finance has two vital concerns, one, financial literacy and two, financial inclusion. These are two distinct but related concepts. Financial inclusion is defined as “a process of promoting, timely and adequate access to a wide range of regulated financial products and services and broadening their use by all segments of society through the implementation of tailored existing and innovative approaches including financial awareness and education with a view to promote financial well being as well as economic and social inclusion” (OECD/INFE 2018). Gender is an important determinant of financial inclusion (Khan et al, 2022). Empirical analysis shows that formal finance is less accessible to women as compared to their male counterparts (Ghosh and Chaudhury, 2018). This gender-based gap with respect to financial inclusion is a global issue. It is reflected by the Global Findex Database 2021, which stated that most of the unbanked individuals across the globe are women. Further, the Global Findex Database also showed that in developing nations, it is more likely for women to have inactive bank accounts as compared to men. This gap is vital to address as enhancing the financial inclusion of women can greatly contribute to their economic and social empowerment (Choudhary and Jain, 2023). Further, it offers holistic approaches to address poverty, encourage inclusive development, and contribute to the attainment of Sustainable Development Goals (Choudhary and Jain, 2023).

To give a brief overview of the relationship between financial inclusion and financial literacy, the former acts on the supply side, while the latter acts on the demand side. So financial inclusion aims to make sure financial services are available to all, and financial literacy aims to empower people to make use of those services. The existing literature establishes financial literacy as an important determinant of financial inclusion (Khan et al, 2022). The review also highlights that the impact of financial literacy on financial inclusion is a proportional one, where low financial literacy levels are seen to be linked with low financial inclusiveness (Khan et al, 2022). Khan et al (2022) also explain that an increase in financial literacy levels, leads to higher demand for formal and informal financial products, thereby enhancing financial inclusion. Moreover, studies recommend improving financial literacy in order to close the gender gap in financial inclusion (Isaac et al, 2020; Rahmawati et al, 2019).

Although the importance of financial literacy is widely acknowledged, the way it is defined and measured differs greatly among agencies and researchers. Kadoya and Khan (2020) point out that most of these definitions view financial literacy in terms of financial knowledge and the ability to understand finance-related issues. These definitions mostly did not pay attention to an individual's ability to use financial knowledge in practice, until the Organization for Economic Co-operation and Development (OECD) incorporated it into their definition of financial literacy (Kadoya and Khan, 2020). It has also been observed that financial literacy and financial knowledge are interchangeably used in some papers (Rai et al, 2019). However, despite the minor disagreements on terminology, the lower levels of women's financial literacy in comparison to their male counterparts is well documented (Zaimovic et al, 2023).

For the purpose of this paper, the following definition, which is similar to the one given by OECD, is considered- Financial literacy is a combination of financial awareness, knowledge, skills, attitude and behavior necessary to make sound financial decisions and ultimately achieve individual financial wellbeing (Atkinson and Messy, 2012). This definition implies that financial literacy has three key aspects: financial knowledge, financial behavior and financial attitude. These three components can be understood as follows:

- **Financial knowledge:** It is defined as understanding of financial calculations such as the implications of interest rates, inflation, and the risk and return on financial securities. This knowledge, in turn, evolves into the skills necessary for moderating individuals' financial behavior and attitudes.
- **Financial behavior:** It is a critical aspect which gauges how people engage in financial transactions and they adeptly apply financial knowledge to make informed decisions. The positive outcomes of financial literacy are intricately linked to individuals' financial behavior.

- **Financial attitude:** It measures individuals' perspectives on financial matters, stands as another integral aspect of financial literacy. The assessment of financial attitude revolves around the importance individuals place on their financial issues, ultimately contributing to securing future benefits.

These three components are interrelated to each other. The positive relationship of financial knowledge with financial behavior has been strongly established (Atkinson and Messy, 2012; Kim et al, 2019; Dewi et al, 2020). Further financial behavior is correlated with financial wellbeing (Riitsalu and Murakas, 2019). Apart from financial behavior, studies have also established a positive relationship of financial knowledge with financial decision-making and financial well-being (Dewi et al, 2020). Therefore, this paper focuses on studying financial knowledge in depth.

Financial knowledge also can be further bifurcated into two components, namely, objective financial knowledge and subjective financial knowledge. They can be understood in the following terms (Dewi et al, 2020). Subjective financial knowledge pertains to individuals' self-perceptions regarding their financial understanding and how they would evaluate their own level of financial knowledge. On the other hand, objective financial knowledge refers to the factual information stored in memory. It is evaluated by assessing individuals' comprehension of diverse elements within financial markets and products, including numeracy, assets, debts, savings and investments, the value of money, inflation, compounding interest, and risk diversification (Dewi et al, 2020).

Notably, subjective financial knowledge has a greater impact on financial behaviors and well-being than objective financial knowledge (Robb and Woodyard, 2011; Riitsalu and Murakas 2021; Lind et al, 2021). Further, it is also shown that objective and subjective financial knowledge have a low correlation between them (Robb and Woodyard, 2011).

However in a country like India where financial literacy levels are low (Klapper and Lusardi, 2020), the focus of studies naturally tends to be on the objective parts of financial literacy, which is also the key focus of government institutions. Moreover, in the global context too, subjective financial knowledge remains as an area which can be explored in greater depths. This lacuna is highlighted in the literature review on financial literacy by Zaimovic et al (2023), which identifies a research gap in the relationship between financial self-efficacy (subjective financial knowledge) and gender differences in financial literacy. Thus, this paper adds to the existing body of literature by studying objective and subjective financial knowledge in terms of their relationship to each other and the relationship between subjective financial knowledge and gender. Further, this paper sets itself apart from other studies by surveying an educated sample of population with most participants at least having or pursuing an undergraduate degree.

The literature review also shows uniformity in the methodology of studying financial literacy, for which the survey method is the popular choice (Goyal and Kumar, 2021). This paper follows the trend and chooses the survey method. The details of which are elaborated in the following section.

3. Data and Methodology

The paper uses data collected through a primary survey using a questionnaire. The survey[2] was conducted on 104 participants who were selected through the convenience sampling method. The convenience sampling method imposes the limitation of lack of generalizability of the study to the entire population. Thus the paper does not aim to make generalized statements on the financial knowledge levels of the country or any specific region. All of the respondents resided in Delhi NCR. Out of which 57.7% were female and 42.3% were male. Most of the respondents (51%) were from the age group 18-24 years, followed by 35-44 years (16.3%), 45-54 years (14.4%), 25-34 years (9.6%), 55-64 years (4.8%) and under 18 years (3.8%). The current or pursuing education level for 52.9% of respondents was an undergraduate degree, 36.5% for a master's degree, 5.8% for high school and 4.8% for a PhD or any educational level higher than a master's degree. Through the questionnaire, objective and subjective scores of financial knowledge were obtained. The first eleven questions of the survey measured objective financial knowledge. The questions were developed on the basis of the questionnaires used by researchers in past studies (Robb and Woodyard, 2011; Lind et al, 2020). The first two questions required basic mathematical abilities, while the rest only tested conceptual

[2] Questionnaire can be accessed through:
https://docs.google.com/document/d/1pPM775hRGE9SYUJWGOrH1kfK81xc4tZ24vii9wA5IPU/edit?usp=sharing

understanding of key concepts like inflation, credit, types of investments, etc. They were multiple-choice questions and had only one correct answer. To calculate the objective score, one point was given for each right answer and no points were given for a wrong answer. There was no negative marking for wrong answers and all questions were compulsory. Thus, each participant could obtain a score ranging from 0 to 11 for objective financial knowledge. The last question of the survey asked the respondent to rate their own financial knowledge on a scale of 1-7. There was no right answer for the last question and the respondent's answer was directly taken to be their subjective score. Then the variances in the samples of the two groups, for both objective and subjective scores respectively, were tested using Levene's test for equality of variances from which equal variance is assumed. The relationship between the subjective and objective scores is tested through correlation analysis. The means of each score were then compared on the basis of gender using a two-tailed t-test with the assumption of equal variance.

4. Results and Analysis

Table 1 and 2 give the summary statistics of objective and subjective scores respectively. The correlation of these scores is given in Table 3 and is explained in the following sub-section.

4.1. Analysis of Correlation between Objective and Subjective Scores

For the first part of the analysis the relationship between the objective and subjective scores of the participants is tested. The results are shown in Table 3. Given the p-value is less than 0.01; we can conclude that the observed correlation is statistically significant. The correlation coefficient is 0.36. It shows a positive relationship between the two variables. However, the coefficient's numerical value suggests that the strength of the relationship between the objective and subjective scores of the participants is weak. Thus, the linear relationship between the subjective and objective scores of participants is statistically significant but not practically important.

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Table 1: Descriptive statistics of objective scores

	Gender	Number of observations	Mean	Mode	Median	Standard Deviation	Standard Error Mean
Objective Scores	Female	60	8.05	9	9	2.20496	0.28466
	Male	44	8.8636	10	10	2.30864	0.34804

Source: Authors' calculations based on survey data.

Table 2: Descriptive statistics of subjective scores

	Gender	No. of observations	Mean	Median	Mode	Standard Deviation	Standard Error Mean
Subjective score	Female	60	4.3	4.5	5	1.54371	0.19929
	Male	44	5.1136	5	4	1.54342	0.23268

Source: Authors' calculations based on survey data.

Table 3: Correlation between subjective and objective scores

Variables	Pearson Correlation	Sig. (2 tailed)	N
Objective Scores			
Subjective scores	.364**	<.001	104
Correlation is significant at the 0.01 level (2-tailed).			

Source: Authors' calculations based on survey data.

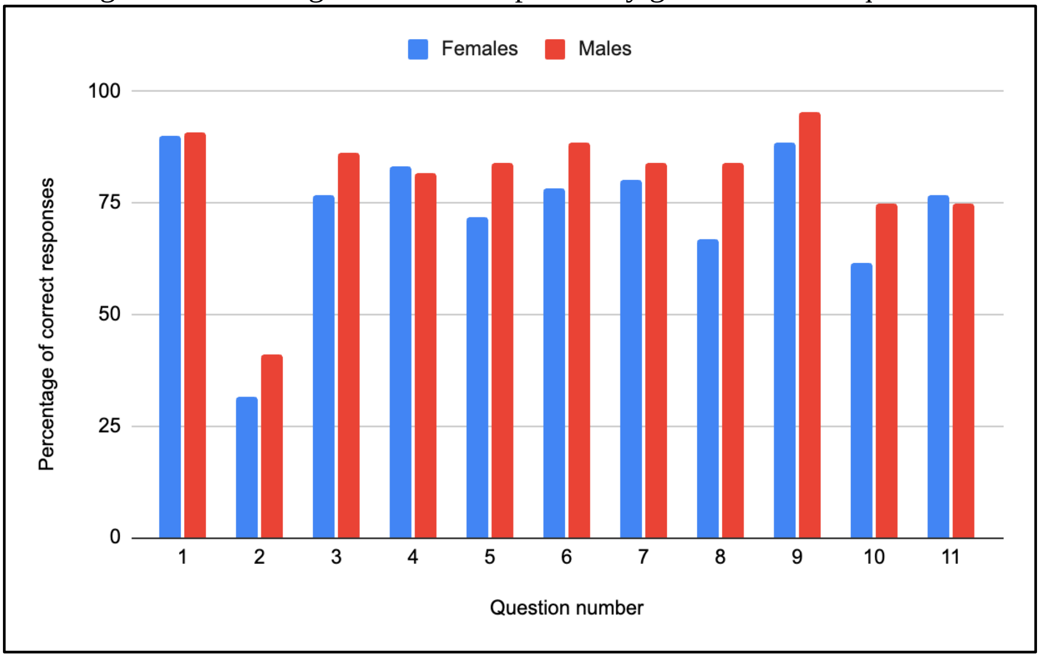
4.2. Analysis of Objective Test Results by Gender

For the next part of the analysis, the differences in the mean objective scores based on gender are considered. There is a slight difference in the means of the objective scores of females and men respectively as can be observed in Table 1. The mean, median and mode score is higher for males. However it is to be noted that the number of observations is unequal for the two groups.

All the aforementioned scores are out of 11, which is the highest possible score. The range of score for females is 1 to 11, whereas for males it is 3 to 11. Figure 1 shows the percentage of females who answered each question correctly with respect to the total number of female respondents, in comparison with the percentage of males which answered each question correctly with respect to the total number of male respondents.

To ascertain whether the observed difference in means of the objective scores of females and males is statistically significant a two-tailed t-test with equal variance is conducted. The null hypothesis being that there is no difference between the objective scores of females and males. The alternative hypothesis asserts that a significant difference exists in the scores of females and males. Table 4 shows the result of the t-test.

Figure 1: Percentage of correct responses by gender for each question



Source: Authors' calculations based on survey data.

Levene's Test for equality of variances was conducted to assess the equality of variances between the two groups. The results showed an F value of 0.001 and a significance value (p-value) of 0.979. This indicates that there is no significant difference in the variances of the two groups. Thus, the assumption of equal variances is met for the subsequent t-test analysis.

The results of the independent samples t-test conducted on males and females indicate that there is no statistically significant difference in objective scores between the two groups, as evidenced by, $p > 0.05$. This suggests that there is not a meaningful distinction between the groups in terms of objective financial knowledge.

Table 4: Result of t-test on objective scores of males and females

Levene's Test for equality of variances	F		0.001
	Sig.		0.979
t-test for equality of means	t		-1.823
	df		102
	significance (two sided p)		0.071
	Mean difference		-0.81364
	Std. Error difference		0.44643
	95% Confidence Interval of the difference	Lower	-1.69913
		Upper	0.07185

Source: Authors' calculations based on survey data.

4.3. Analysis of Subjective Score Results by Gender

The subjective scores of the respondents lie between 1 to 7; with 7 representing the highest degree of confidence one has on his/her own financial knowledge. The rating which a respondent gives to himself/herself is directly taken as their subjective score.

The mean subjective score of females was 4.3 and that of males was 5.1 (refer to Table 2). To ascertain whether this difference in means of females and males is statistically significant, a two-tailed t-test is conducted. For the purpose of the t-test, the null hypothesis is that there is no difference between the subjective scores of females and males. The alternative hypothesis is that there is a significant difference between the subjective scores of females and males. Table 5 shows the result of the t-test.

Table 5: Result of t-test on subjective scores

Levene's Test for equality of variances	F		0.278
	Sig.		0.599
t-test for equality of means	t		-2.656
	df		102
	significance (two sided p)		0.009
	Mean difference		-0.81364
	Std. Error difference		0.30637
	95% Confidence Interval of the Difference	Lower	-1.42132
		Upper	-0.20595

Source: Authors' calculations based on survey data.

Levene's test for equality of variances shows F value of 0.278 and a significance or p-value of 0.599. This proves that there is no significant variance in the two groups and assumption of equal variances holds.

The results of the independent samples t-test conducted on subjective scores of males and females indicate a statistically significant difference in subjective financial knowledge between the two groups, as $p < 0.05$. This suggests that there is a meaningful distinction in subjective scores between the groups. Thus we can conclude that on average, females had a lower subjective score than males.

5. Conclusion

The analysis shows that a linear and positive correlation exists between the objective and subjective scores of financial knowledge of the participants. However the strength of the correlation is weak and thus not practically important. The average objective financial knowledge scores of males and females who participated in the study showed no significant difference. Yet there is a significant difference in their subjective scores. The subjective scores indicate the subjective financial knowledge of a person which reflects the level of confidence they have in their own knowledge. This shows that even in an educated sample of the population with no prominent gender gap in objective knowledge on the topic of financial knowledge, there exists a gender gap in subjective perception of one's own knowledge. It has been shown that females on average, exhibit a lower confidence level or they rate their own financial knowledge lower than males. This implies that a person's actual level of financial knowledge and his or her confidence in the same are not strongly related. Thus, to achieve financial well-being in a gender-inclusive manner, the policies and educational programmes may need to do more than just increase the objective financial knowledge of women.

This conclusion falls in line with the previous studies which suggest females show a lower confidence level and lower capacity for risk. Hence studies have also noted behavioral differences like women being more open to taking financial advice than men. However, a gender gap in objective financial knowledge has been well documented across countries including both developing and developed economies (Hasler and

Lusardi, 2017), which has not been seen in this study. This may be due to the fact that almost all the participants were pursuing or had completed an undergraduate degree at the minimum.

An important implication of the findings of this paper is that the subjective financial knowledge of women needs to be given attention. Increasing an individual's subjective knowledge is way more complicated than addressing the objective part. The paper also shows that working on increasing females' objective knowledge may not be a sufficient method for increasing their financial inclusion. There is a need to enhance subjective financial knowledge of women which is an important aspect in achieving financial well-being. Hence, the paper suggests further research to narrow down the reasons behind the lower subjective knowledge of women and the ways to improve the same.

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