ORIGINAL ARTICLE

A systematic review of investment confidence, risk appetite and dependence status of women

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Abstract Numerous studies worldwide have explored the intriguing realm of women investors, scrutinising their investment confidence, risk appetite, and financial dependence. In this compelling exploration, the study embarks on a journey with two distinct objectives. The first was to identify the factors that affect the investment confidence, risk appetite and dependence status of women while making investment decisions in the family. Another objective was to examine whether the changes in demographics like Age, Education, Employment Status, Annual Income, Nature of Workplace, etc., change the investment confidence, risk appetite, and dependence status of women. The article immerses the reader in the rich tapestry of literature, unearthing insights that have shaped the understanding of the unique investment behaviours of women. The research journey includes the collection of responses through a structured questionnaire. The population of this study was women hailing from diverse corners of the Delhi-NCR Region in India, spanning an age range from 18 to 65 years. A Purposive sampling method led to a dataset of 500 participants eager to share their perspectives. ANOVA and Welch tests were used along with the Post hoc analysis using the Tuckey HSD method and Games Howell Method to identify the significant differences in the categories of independent variables. The culmination of this study reveals an exciting revelation: the dynamic interplay of age, education, employment status, annual income, and workplace environment significantly alters the investment confidence, risk appetite, and financial autonomy of women, marking a testament to the fascinating evolution of women in the world of finance.

Keywords Investment confidence · Risk appetite · Dependence status · Women investor · Financial literacy

JEL Classification **G11:** Portfolio Choice · Investment Decisions · **G2:** Financial Institutions and Services · **G51:** Household Saving, Borrowing, Debt, and Wealth · **G53:** Financial Literacy

1 Introduction

Many studies were conducted worldwide to study the characteristics of women investors. Among many others, the investment confidence, risk appetite, and dependence status of women were primarily studied in these studies. This article also attempts to review the literature available for understanding the investment confidence, risk appetite, and dependence status of women investors. It also highlights how the changes in socio-demographics like age, income level, wealth, education, occupation or profession, and marital status affect the investment confidence, risk appetite, and dependence status of women.

In academic and professional literature, standardised definitions for terms like "investment confidence," "risk appetite," and "dependence status" are generally lacking. However, it is expected to amalgamate various definitions

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to obtain a more comprehensive understanding of these variables. "Investment confidence" can be defined as "the belief or trust that an individual or entity has in making investment decisions". Investment confidence could also be defined in the context of "an individual"s willingness and ability to invest, take risks, and manage their investment portfolio with a sense of assurance." "Risk appetite" is the level of uncertainty or financial risk that an individual, organisation, or investor is willing to accept in pursuit of their financial goals. It reflects a willingness to take on risk in the hope of achieving higher returns or specific objectives. "Dependence status" while making investment decisions refers to the extent to which an individual relies on others, such as financial advisors, family members, or professionals, when making investment choices. It reflects the degree of dependence or independence in managing their investment portfolio. Individuals with a high dependence status may seek guidance or delegate investment decisions to others, while those with a low dependence status may prefer to make investment choices independently.

The empirical research in this study was conducted to examine whether the change in demographics like Age, Education, Employment Status, Annual Income, and Nature of Workplace also changes the investment confidence, risk appetite, and dependence status of women.

2 Review of literature

This section covers the findings of various research studies conducted on women investors to understand the factors affecting the investment confidence, risk appetite, and dependence status of women.

2.1 Investment confidence

Many Studies found women to be generally less confident while making investment decisions (Arti & Sunita, 2011; Barber & Odean, 2001; Kansal, 2016; Powell & Ansic, 1997; Schumell, 1996; Sharma et al., 2023; Sharma & Kota, 2019a) when compared to their male counterparts. In one of the researches, gender was the most important explanatory factor affecting the confidence level of women while making investment decisions (Powell & Ansic, 1997). Men are more confident in their abilities than women (Mittal & Vyas, 2011). Researches also found that women are less confident in making financial decisions (Schumell, 1996). This may be one of the reasons for greater risk tolerance in men (Mittal & Vyas, 2011). One of the studies conducted in India also found female investors to be less confident while making investment decisions and, hence, have lower satisfaction levels (Arti & Sunita, 2011). Females were less confident about their
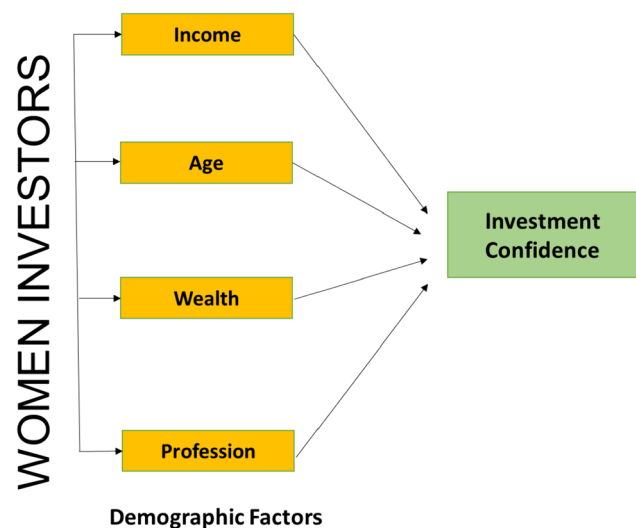

Fig. 1 Factors affecting investment confidence of women

decisions after controlling for factors such as age, experience, education, knowledge, and asset holdings (Powell & Ansic, 1997). After controlling factors like background, ability, and expected outcomes of different investment options, female investors had lower confidence in their investment decisions (Estes & Hosseini, 1988).

One of the research studies cites a Lack of confidence as one of the weaknesses of Women as investors (Vohra & Kaur, 2017b). In the area of finance, it was the lack of confidence that prevented women from trading in the stock market (Arti & Sunita, 2011; Barber & Odean, 2001; Sahota, 2018). The same is true especially if the availability of funds is low (Arti & Sunita, 2011). In a study, it was found that women are more cautious towards risky investments (Arti & Sunita, 2011). As they are more cautious and less confident about their investment decisions, they earn fewer returns than men (Barber & Odean, 2001).

Women often express having a low level of confidence in their financial expertise (Wealth, 2011). In one research, 52% of women feel confident enough to make investment decisions (Westerhuis, 2018). As per the research conducted by the Financial Times, women were more likely to describe themselves as less knowledgeable about investing than men and were more likely to rely on male partners to make investment decisions. This lack of confidence was also highlighted in a study where 52% of women had never held an investment product compared with just 37% of men (Westerhuis, 2018). According to another research, about half (52%) of women were confident in managing investments (Merril Lynch, 2015). Similar results were found in a poll conducted by the CIBC; only half said they feel confident or have the knowledge to invest (HAIGH, 2018). Another research found that 43% of women feel they need more confidence

in making decisions regarding their financial investments (Moxie Future, 2018) (Fig. 1).

The profession of women also affects their confidence. Females employed as professionals were found to be more confident and outgoing. On the other hand, Housewives and self-employed females lack confidence and rely more on the advice of their spouses and other family members (Juyal & Singh, 2009).

Women with assets of $1 million or greater were more confident and risk-tolerant, although these trends did not hold in all countries (Hewlett et al., 2014). Many studies suggested that it is not only the women"s earnings that bring an automatic increase in their bargaining power in the household as other factors like gender ideologies may be more important than income in some cases (Grasmuck & Espinal, 2000; Tichenor, 1999; Zipp et al., 2004). It is not only the income but the extent to which higher levels of income allow women to see themselves differently that is important (Bruce, 1989). Women feel more confident with higher income levels and are more likely to be interested in responsible investment (Moxie Future, 2018).

One of the studies conducted in three small cities of Mumbai clearly shows that while earning women have chosen areas where they can still excel, they are not very confident regarding investment. They prefer relying on others" advice instead of making their own decisions. This was because of the family setup, where females have never made any financial decisions (Dusseja, 2016).

The age of the women can also affect the level of confidence among women investors. Women under 40 were found generally to be more confident and risk-tolerant than older women, although these trends were not true in all countries (Hewlett et al., 2014). Similar results were found in another study where younger women tend to have more confidence in their investing skills (Advisors, 2018).

2.2 Risk appetite

Many studies support that women are more risk-averse than men (Accenture, 2017; Advisors, 2018; Jawaheer & Manual, 2016; Mittal & Vyas, 2011; Nielsen, 2012; Olsen & Cox, 2001; Sharma & Kota, 2019a; Wealth, 2011). As per the research conducted by Nielsen in 56 different countries, findings suggest that Men like risk; women are more cautious (Nielsen, 2012). In one of the studies conducted on Mauritian women, it was found that the women generally choose investment plans with lower risk than their male counterparts (Jawaheer & Manual, 2016). The survey conducted on 5200 men and 6400 women concluded that women are more risk-averse than men (Barsky et al., 1997). This Risk aversion is one of the significant weaknesses of women investors (Vohra & Kaur, 2017b).

Women often express lower confidence about their financial expertise and their investment decisions and have lower satisfaction levels (Arti & Sunita, 2011). Lower confidence could be one reason why women are risk-averse or conservative while selecting investment options. The 2011 NCAER Household Survey also highlights that, on average, women take less risk than their male counterparts (Nagarajan et al., 2011). As they are safety-oriented and reluctant to take risks, women do not make investment decisions (EY & ASSOCHAM, 2018). As per another study, it was found that women were found to be more conservative long-term investors than men (Accenture, 2017). This is also reflected in their behaviour, as they are more cautious vis-à-vis males about prospective investment in equity shares, especially if the availability of funds is low (Arti & Sunita, 2011). Females have less risk-taking tendencies, resulting in less risky behaviour (Powell & Ansic, 1999). The results of a study conducted by other researchers were also similar, which shows that women are more risk-averse than men in general. As a result, they chose less risky assets in their portfolios (Olsen & Cox, 2001). Many women cite risk aversion as one of the reasons causing them to avoid the stock market (Sahota, 2018). The level of risk tolerance in women was also found to be low, as per one of the studies conducted in Malaysia (Yusof, 2015).

In the study conducted in India, women had shown a preference for low-risk investments like post office and bank deposits. In contrast, men preferred high-return-high-risk investment securities like equity (Mittal & Vyas, 2011). The results of other studies were similar, where the women held less risky assets than men (Jianakoplos & Bernasek, 1998; Sharma et al., 2023; Sharma & Kota, 2019a). Another study found that they choose less risky alternatives (Powell & Ansic, 1997). Women also invested their pensions more conservatively than men (Bajtelsmit & VanDerhei, 1997; Hinz et al., 1997) (Fig. 2).

However, no matter how many studies proved women to be more risk-averse than men, some studies have also proved the contrary. For instance, one of the studies conducted in Germany and the Netherlands found that gender seems to have no significant effect on the level of risk tolerance (Badunenko et al., 2009). Another study suggested that it is due to a lack of wealth and education; women took fewer risks as compared to men while making investments in mutual funds (Dwyer et al., 2002). Another research, while measuring the gender difference in risk aversion, suggested that if the same level of education is given to both men and women, irrespective of their knowledge of finance, there will be no difference in the risk aversion of men and women (Hibbert et al., 2008). The study found that the relation of gender risk aversion is a function of age, income, wealth, marital status, race/ethnicity, and the number of children under 18 in the household (Hibbert et al., 2008). Factors
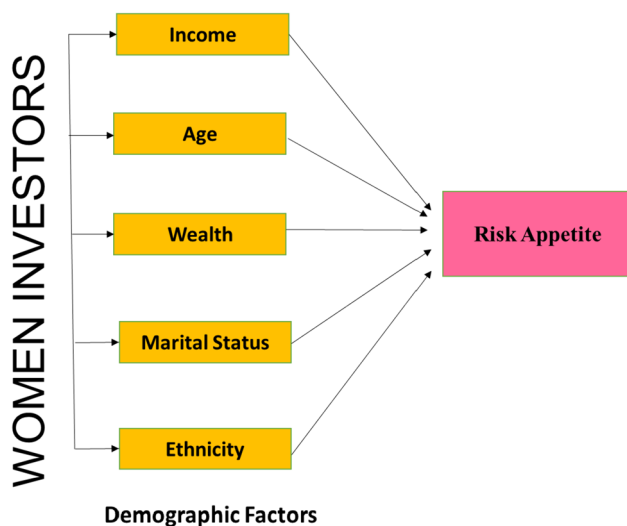
Fig. 2 Factors affecting the risk appetite of women

like geography, generation, wealth level and wage-earning status of women may affect the risk appetite of the women. As a result, women"s risk aversion cannot be generalised or assumed to be higher than men"s (Hewlett et al., 2014). The research conducted by Nielsen in 56 countries highlights that the risk appetite of working females who were affluent and financially independent in the Asia–Pacific region was at parity with males in their investment decisions. They were willing to accept the considerable volatility of ($\pm 15\%$ or above) in their investments (Nielsen, 2012). Due to changes in the demographics, Women"s attitude towards investment avenues has also been changing, and they are open to making financial investments that have greater risk (Paramashivaiah et al., 2014).

As men tend to have more money than women, their risk tolerance is higher as compared to women. A report from Spectrum Group found that of the women earning more than $200,000, 54 per cent were willing to take "a significant investment risk" to earn higher returns, compared with 32 per cent of the broader population of investors (Greenfield, 2018). Women with assets of $1 million or greater were more confident and risk-tolerant, although these trends did not hold in all countries (Hewlett et al., 2014).

Findings from other studies (Arch, 1993; Schneider & Lopes, 1986) highlighted that the motivations behind investments among different genders were different. Women were motivated by their desire for security, while men were motivated by their desire for increased returns. The desire for security leads to a lower preference for risk among women. The motivation behind investing could be a factor in which women may have risk-averse behaviour.

The age of women is another factor that may affect the risk appetite of women. The confidence level of the younger women in their investing skills was higher, but in general, they were more risk-averse (Advisors, 2018). In one of the studies, it was found that women under the age of 40 were generally more confident and risk-tolerant than older women, although these trends were not true for all countries (Hewlett et al., 2014).

2.3 Dependence status

Female purchase roles and decision-making ability are affected by their family type (joint or nuclear) (Dusseja, 2016; Juyal & Singh, 2009). Other factors may include education level, age, occupation, and income levels. Studies found that the income levels do affect their purchase roles and decision-making abilities (Juyal & Singh, 2009; Sharma et al., 2023; Sharma & Kota, 2019b). Women prefer relying on the advice of others (Dusseja, 2016; Loibl et al., 2007; Vohra & Kaur, 2017b) like their spouse (Chandra, 2013; Javed, 2014; Kathuria & Singhania, 2012; Nielsen, 2012; Services, 2014), father (Digital, 2013; Javed, 2014), family/parents (Ameriprise, 2016; Ernst & Young, 2017; EY & ASSOCHAM, 2018; Guzior, 2018; Javed, 2014; Kathuria & Singhania, 2012; Nielsen, 2012; Vohra & Kaur, 2017a), friends (Ernst & Young, 2017; EY & ASSOCHAM, 2018; Guzior, 2018; Javed, 2014; Nielsen, 2012), colleagues (Guzior, 2018), and a financial advisor (Ernst & Young, 2016).

Research conducted in three small cities of Mumbai clearly shows that when it comes to investment decision-making, earning women prefer relying on others" advice instead of choosing their path. The reason for this was the family setup, where females have never taken any financial decisions (Dusseja, 2016). According to one of the studies conducted in Uttarakhand in India, females living in a joint family setup were more concerned about the impression their purchase decisions would make on their in-laws (Juyal & Singh, 2009).

As per the research conducted by Nielsen in 56 different countries, Women are 25% more likely than men to rely on friends and family for advice on personal finance matters (Nielsen, 2012). Women are far more likely to rely on the advice of friends and family when making investment decisions — both now and in the future (Ernst & Young, 2017).

A study for DSP Blackrock conducted by Nielsen reported that 77% of working women bank on spouses and/or parents for their investment decisions in India (EY & ASSOCHAM, 2018). Of the remaining 23% of women who invest independently, 18% were single working women. The results of another research were similar, where only 30% of the women said that they make their investment decisions alone rather than relying on their spouse or other family members (Damisch et al., 2010). According to the Market Strategies survey, when it comes to learning more about financial products and investments, 38 per cent of Millennial women turn to

family, friends, and colleagues (Guzior, 2018). The findings of another research also highlighted that the "advice of parents and spouse" was the most crucial factor that influences the investment decision of female investors (Kathuria & Singhania, 2012). Females employed as professionals were more confident, outgoing, and trusting while making investment decisions. On the other hand, homemakers and self-employed females relied on the advice of their spouses and other family members and were less confident while making independent decisions (Juyal & Singh, 2009).

Women with less education, i.e., uneducated or had education till school level, were dependent on their family, i.e., advice of their husband or father for investment decisions. Educated women with graduation or professional degrees search for the advice of husbands or fathers and the advice of friends/experts while making investment decisions. Women with high incomes made their own investment decisions, whereas those who were from the lower-income category were dependent on the advice of their husbands and friends (Javed, 2014).

Women typically spend more time educating themselves before making a decision, and they tend to have a longer sales cycle and choose a financial advisor based on relationship, brand affinity, and trust (Ernst & Young, 2016). The Visa"s Women"s Money Matters Survey 2013 survey found that South African women were likelier to ask their spouse or partner for financial advice than to seek an independent adviser (Services, 2014). On the contrary, one of the surveys found that women do not necessarily want to delegate decision-making to an investment manager and are less likely than men to use other people to help them reach their financial goals (Wealth, 2011) (Fig. 3).

The study found that 41 per cent of women surveyed were making financial decisions alone. While most of these women were either unmarried or divorced (63%), the rest (37%) were in long-term relationships and making financial decisions for the household. Among married women, only one in ten (11%) Boomers and 22% of Gen X were primary financial decision-makers — considerably fewer than the 38% of married Millennial women who consider themselves as such. Younger women were more likely to have learned from their parents about finances while growing up (Ameriprise, 2016).

In another research, it was found that Thirty-eight per cent of millennial women look to friends, family, and colleagues, while the same percentage of millennial men were flocking to YouTube as a source used to learn and understand investments (Guzior, 2018).

As per the study conducted in Punjab, India, it was found that the women who do not invest in stocks depend on their families for advice, while those who invest in stocks rely upon their personal opinions (Vohra & Kaur, 2017a). This is due to the differences in their level of financial knowledge.
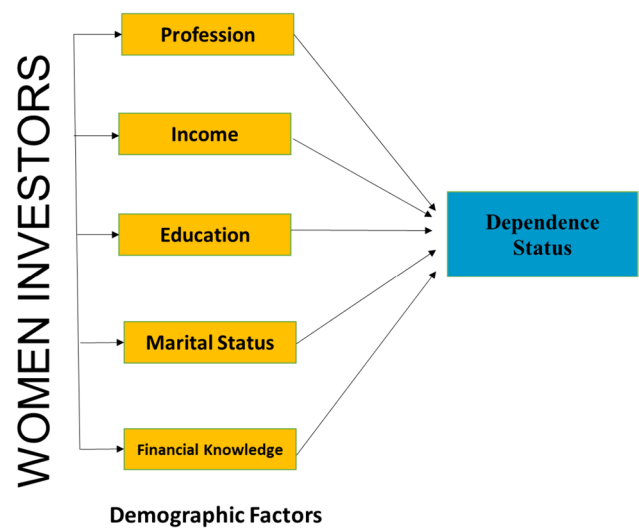

Fig. 3 Factors affecting dependence status of women

Another research cited too much dependence on guidance from others while making investment decisions as one of the weaknesses of female investors (Vohra & Kaur, 2017b).

An empirical study was planned in the Delhi NCR region to test whether the finding of the literature holds in the Indian context as well.

3 Research gaps

While the research provides valuable insights into the investment behaviours of women, there is a need for a more in-depth understanding of the specific socioeconomic contexts in which these behaviours manifest. The studies cited cover a range of countries, but there may be unique factors influencing women"s investment attitudes in different regions. The research study focused on broad gender differences but often overlooked intersectional factors such as Age, Education, Employment Status, Annual Income, and Nature of the Workplace. Investigating how these intersecting identities affect investment confidence, risk appetite, and dependence status can provide a more comprehensive picture.

4 Methodology and objectives

The empirical research was conducted in this study, where the responses were collected with the help of a questionnaire. The population for the study consisted of women from different segments of the Delhi-NCR Region in India. Respondents were in the age group of 18 – 65 years of age. The sample size was 500, collected using the Purposive sampling method. The data was collected during the period of

3 months, i.e. July to October 2022. Secondary data was collected with the help of research articles published reports of various research and consultancy firms and regulators.

The study was planned with two main objectives, which are as follows:

1. To identify the factors that affect the investment confidence, risk appetite and dependence status of women while making investment decisions in the family.
2. To examine whether the changes in demographics like Age, Education, Employment Status, Annual Income and Nature of Workplace change the investment confidence, risk appetite, and dependence status of women.

5 Purpose & significance of the research

The purpose of this research is to explore how demographic changes such as age, education, employment status, annual income, and nature of the workplace impact investment confidence, risk appetite, and financial dependence in the context of family investment decisions of women. The findings of this research are expected to contribute valuable insights to the understanding of women"s unique investment behaviors, thereby aiding researchers, policymakers, and financial planning professionals in crafting more informed strategies and policies tailored to address the specific needs and challenges faced by women investors.

The study uncovered that the changes in demographics like Age, Education, Employment Status, Annual Income, and Nature of Workplace of women change the investment confidence, risk appetite, and dependence status of women. As these three are important aspects that would define the role of women in investment decision-making in the family, the findings of the study will help the researchers, policymakers, and financial planning professionals better understand the investment behavior of women, especially in the family context.

6 Results and discussion

6.1 Demographics of sample

Five hundred responses were collected from the women respondents in the Delhi NCR region in which 13.40% of respondents were in the age group of 18–25 years, 40.80% of respondents were in the age group of 26–35 years, 22.40% respondents in the age group of 36–45 years, 15.40% respondents in the age group of 46–55 years, and remaining 8.00% were in the age group of 56–65 years. For educational qualifications, 12.20% of respondents had completed their education till Primary, 5.60% had completed their education

till 10th / Secondary level, 10.00% up to 12th / Senior Secondary level, 18.20% respondents were Graduate, 42.80% were Post Graduate and remaining 11.20% had completed their Doctorate (PhD). 66.80% of respondents were working, 32.00% of respondents were Non-Working, and 1.20% of respondents were Retired. 39.80% of respondents had an annual income of Below 2.5 Lakhs, 13.60% of respondents were earning annual income in the range of 2.5—5 Lakhs, 15.40% were in the income bracket of 5—7.5 Lakhs, 12.00% in the income bracket of 7.5—10 Lakhs, and 19.20% respondents were earning more than 10 Lakhs per annum. Among the working women, 32.87% were working in the finance-related industry, whereas 67.13% of respondents were working in the non-finance-related industry.

6.2 Investment confidence

$H_1 =$ *There are significant differences between the mean scores of Investment confidence for the various categories of demographics like Age, Education, Employment Status, Annual Income, and Nature of Workplace.*

To test whether there were significant differences between the mean scores of Investment confidence for the various categories of demographics like Age, Education, Employment Status, Annual Income, and Nature of Workplace, ANOVA and Welch tests were used along with the Post hoc analysis using Tuckey HSD and Games Howell Method. Table 1 highlights the descriptives showing the Mean and Std. Deviation for the question related to the investment confidence.

Table 2 represents the Test of Homogeneity of Variances using the Levene test statistics for investment confidence.

The P-value of 0.076 (more than 0.05) in the age category, as shown in Table 2, signifies that equal variance was assumed; thus, one way ANOVA test was used to check whether there was a significant difference between the mean scores of Investment confidence for the various categories of age. Table 3 shows the results of the ANOVA test conducted to test the hypothesis for the independent variable, i.e., age.

As the P-value was less than 0.05, as shown in Table 3, the null hypothesis was rejected, which signifies that at least one of the age categories differs significantly from the rest in their mean scores. For detailed analysis, a Paired comparison test was conducted by Post hoc analysis using the Tuckey HSD Method. In the paired comparison, it was observed that mean scores of Investment confidence in the age category of "26–35" years were significantly different from "46–55" and "56–65" categories. The age category of "36–45" years was significantly different from "46–55" and "56–65" categories. The age category of "46–55" years was significantly different from "26–35" and "36–45" categories. The age category of "56–65" years was significantly different from "26–35" and "36–45" categories. As the age of the women increases,

Table 1 Descriptives showing the Mean and Std. Deviation for investment confidence

Descriptives				
I feel confident while making my own investment decisions		N	Mean	Std. Deviation
Age	18–25	67	3.10	1.468
	26–35	204	3.56	1.435
	36–45	112	3.23	1.599
	46–55	77	2.52	1.536
	56–65	40	2.40	1.598
	Total	**500**	**3.17**	**1.558**
Education	Primary	61	1.39	.640
	10th / Secondary	28	1.50	.745
	12th / Senior Secondary	50	2.12	1.223
	Graduate	91	3.13	1.439
	Post Graduate	214	3.97	1.276
	Doctorate (Ph.D)	56	3.93	1.142
	Total	**500**	**3.17**	**1.558**
Employment Status	Working	334	3.72	1.380
	Non-Working	160	2.00	1.239
	Retired	6	4.33	1.211
	Total	**500**	**3.17**	**1.558**
Annual Income	Below 2.5 Lakhs	199	2.09	1.298
	2.5—5 Lakhs	68	3.31	1.499
	5—7.5 Lakhs	77	3.79	1.260
	7.5—10 Lakhs	60	4.15	1.087
	More than 10 Lakhs	96	4.23	1.061
	Total	**500**	**3.17**	**1.558**
Nature of Workplace	Finance related Industry (Bank/Accountant/Investment or Insurance companies)	119	4.72	0.637
	Others/Non-Finance Related Industry	243	3.09	1.410
	Total	**362**	**3.63**	**1.432**

Table 2 Test of Homogeneity of Variances using Levene Statistic for investment confidence

Test of Homogeneity of Variances				
I feel confident while making my own investment decisions	Levene Statistic	df1	df2	Sig
Age	2.134	4	495	0.076
Education	9.944	5	494	0.000
Employment Status	5.588	2	497	0.004
Annual Income	5.806	4	495	0.000
Nature of Workplace	143.652	1	360	0.000

the mean scores decrease, which signifies that the investment confidence decreases as the women age, as shown in Table 1.

For other demographics like Education, Employment Status, Annual Income, and Nature of Workplace, the P-value was less than 0.05, as in Table 2. Equal variances were not assumed, and thus, the Welch test was used to check whether there was a significant difference between the mean scores of Investment confidence for the various categories of demographics like Education, Employment Status, Annual Income, and Nature of Workplace. Table 4 represents the results of the Welch test to test the hypothesis

Table 3 Results of ANOVA for Investment confidence with Independent Variable-Age

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig
I feel confident while making my own investment decisions	Between Groups	88.637	4	22.159	9.765	0.000
	Within Groups	1123.225	495	2.269		
	Total	1211.862	499			

Table 4 Results of Welch test for investment confidence with Independent Variables- Education, Employment Status, Annual Income and Nature of Workplace

Robust tests of equality of means					
I feel confident while making my own investment decisions		Statistic[a]	df1	df2	Sig
Education	Welch	121.653	5	144.944	0.000
Employment Status	Welch	94.752	2	13.521	0.000
Annual Income	Welch	73.310	4	190.304	0.000
Nature of Workplace	Welch	228.808	1	358.163	0.000

[a]Asymptotically F distributed

for the independent variables, i.e., Education, Employment Status, Annual Income, and Nature of Workplace.

As the *P*-Values were less than 0.05 for all the independent variables, as shown in Table 4, the null hypothesis for all the demographics was rejected, which signifies that at least one of the categories of demographics like Education, Employment Status, Annual Income, and Nature of Workplace differs significantly from the rest in their mean scores. For detailed analysis, a Paired comparison test was conducted by Post hoc analysis using the Games Howell Method.

When the paired comparison was conducted to identify the significant differences in the mean scores of Investment confidence in the various categories of education, it was found that the "Primary" category was significantly different from "12th / Senior Secondary", "Graduate", "Post Graduate", and "Doctorate (PhD)" categories. The Category of "10th / Secondary" was significantly different from the "Graduate", "Post Graduate", and "Doctorate (PhD)" categories. The category of "12th / Senior Secondary" was significantly different from all other categories except the "10th / Secondary" category. The Category of "Graduate" was significantly different from all other categories. The Category of "Post Graduate" was significantly different from all other categories except the "Doctorate (Ph.D)" category. The category of "Doctorate (Ph.D)" was significantly different from all other categories except the "Post Graduate" category. The investment confidence increases with the education of women, which can be seen using the mean scores given in Table 1 for the various categories of education.

When the paired comparison was conducted to identify the significant differences in the mean scores of Investment confidence in the categories of Employment Status, a mean difference of 1.716 was found in the categories of "Working" and "Non-working" categories, which were significant. The category of "Non-Working" was significantly different from both "Working" and "Retired" categories. The working women category had a mean score of 3.72, whereas it was 2.00 for the non-working women, as shown in Table 1. This

signifies that the Employment Status affects the investment confidence of the women.

When the paired comparison was conducted to identify the significant differences in the mean scores of Investment confidence in the categories of Annual Income, it was found that category "Below 2.5 Lakhs" was significantly different from all the other four categories, i.e., "2.5—5 Lakhs", "5—7.5 Lakhs", "7.5—10 Lakhs", and "More than 10 Lakhs" categories. The category of "2.5—5 Lakhs" was significantly different from all other categories except the "5—7.5 Lakhs" category. The category of "5—7.5 Lakhs" was significantly different from the "Below 2.5 Lakhs" category. The category of "7.5—10 Lakhs" was significantly different from the "Below 2.5 Lakhs" and "2.5—5 Lakhs" categories. The category of "More than 10 Lakhs" was significantly different from the "Below 2.5 Lakhs" and "2.5—5 Lakhs" categories. The investment confidence increases with the increase in the Annual Income of women, which can be seen using the mean scores given in Table 1 for the various categories of annual income.

When the paired comparison was conducted to identify the significant differences in the mean scores of Investment confidence in various categories of Nature of the Workplace, the category of "Finance-related Industry" was significantly different from the "Others/ Non-Finance related Industry" category. The women working in the finance-related industry were more confident when compared with the women working in the non-finance-related industries, which signifies that the Nature of the Workplace is an important variable that affects the investment confidence of women.

6.3 Risk appetite

H₂ = *There are significant differences between the mean scores of Risk Appetite or the exposure to risky assets in their portfolio for the various categories of demographics like Age, Education, Employment Status, Annual Income, and Nature of Workplace.*

To test whether there were significant differences between the mean scores of Risk Appetite or the exposure to risky assets in their portfolio for the various categories of demographics like Age, Education, Employment Status, Annual Income, and Nature of Workplace, the Welch test was used along with the Post hoc analysis using Games Howell Method as the equal variances were not assumed as shown in the Levene statistics in the Table 6. Table 5 highlights the descriptives showing the Mean and Std. Deviation for the question related to the Risk Appetite or the exposure to risky assets in their portfolio.

Table 6 represents the Test of Homogeneity of Variances using the Levene test statistics for the Risk Appetite or the exposure to risky assets in their portfolio.

Table 5 Descriptives showing the Mean and Std. Deviation for Risk Appetite or the exposure to risky assets in their portfolio

Descriptives				
I have more risky assets (like equity, ELSS, and equity-oriented mutual funds) in the portfolio than less risky assets (like FD, government securities & bonds, etc.)		N	Mean	Std. deviation
Age	18–25	67	2.76	1.447
	26–35	204	2.89	1.578
	36–45	112	2.78	1.702
	46–55	77	2.10	1.578
	56–65	40	1.95	1.616
	Total	**500**	**2.65**	**1.622**
Education	Primary	61	1.15	0.401
	10th / Secondary	28	1.07	0.262
	12th / Senior Secondary	50	1.72	1.196
	Graduate	91	2.49	1.580
	Post Graduate	214	3.38	1.511
	Doctorate (Ph.D)	56	3.38	1.496
	Total	**500**	**2.65**	**1.622**
Employment Status	Working	334	3.15	1.597
	Non-Working	160	1.64	1.129
	Retired	6	2.00	1.673
	Total	**500**	**2.65**	**1.622**
Annual Income	Below 2.5 Lakhs	199	1.72	1.159
	2.5—5 Lakhs	68	2.56	1.429
	5—7.5 Lakhs	77	3.08	1.628
	7.5—10 Lakhs	60	3.42	1.465
	More than 10 Lakhs	96	3.82	1.556
	Total	**500**	**2.65**	**1.622**
Nature of Workplace	Finance related Industry (Banks/Accountant/Investment or Insurance companies)	119	4.26	1.252
	Others/Non-Finance Related Industry	243	2.43	1.434
	Total	**362**	**3.03**	**1.623**

Table 6 Test of Homogeneity of Variances using Levene Statistic for Risk Appetite or exposure to risky assets in their portfolio

Test of homogeneity of variances				
I have more risky assets (like equity, ELSS, Equity equity-oriented mutual funds) in the portfolio when compared with less risky assets (like FD, government securities & bonds, etc.)	Levene Statistic	df1	df2	Sig
Age	2.615	4	495	0.035
Education	49.702	5	494	0.000
Employment Status	41.915	2	497	0.000
Annual Income	12.119	4	495	0.000
Nature of Workplace	13.299	1	360	0.000

For all the independent variables, i.e., Age, Education, Employment Status, Annual Income, and Nature of Workplace, the *P*-value in the Test of Homogeneity of Variances using the Levene Statistic, as shown in Table 6 was less than 0.05, which signifies that equal variances were not assumed. Thus, the Welch test was used to check whether there were significant differences between the mean scores of Risk Appetite or the exposure to risky assets in their portfolio for the various categories of demographics like Age, Education, Employment Status, Annual Income, and Nature of Workplace. Table 7 represents the results of the Welch test to test the hypothesis for these independent variables.

Table 7 Results of Welch test for Risk Appetite or exposure to risky assets in their portfolio with Independent Variables- Age, Education, Employment Status, Annual Income and Nature of Workplace

Robust tests of equality of means

I have more risky assets (like equity, ELSS, Equity equity-oriented mutual funds) in the portfolio when compared with less risky assets (like FD, government securities & bonds, etc.)		Statistic[a]	df1	df2	Sig
Age	Welch	5.567	4	161.807	0.000
Education	Welch	113.797	5	168.623	0.000
Employment status	Welch	69.102	2	13.394	0.000
Annual income	Welch	47.190	4	179.074	0.000
Nature of workplace	Welch	155.259	1	264.980	0.000

[a]Asymptotically F distributed

As the *P*-value was less than 0.05 for all the independent variables, as shown in Table 7, the null hypothesis was rejected, which signifies that at least one of the categories of demographics like Age, Education, Employment Status, Annual Income, and Nature of Workplace differs significantly from the rest in their mean scores. For detailed analysis, a Paired comparison test was conducted by Post hoc analysis using the Games Howell Method.

In the paired comparison, it was observed that mean scores of Risk Appetite or the exposure to risky assets in their portfolio in the age category of "26–35" years were significantly different from "the 46–55" and "56–65" categories. The age category of "36–45" years was significantly different from the "46–55" category. The age category of "46–55" years was significantly different from "26–35" and "36–45" categories. The age category of "56–65" years was significantly different from the "26–35" category. The Risk Appetite or the exposure to risky assets in their portfolio decreases as the women age, which is evident from the mean scores given in Table 5.

When the paired comparison was conducted to identify the significant differences in the mean scores of Risk Appetite or the exposure to risky assets in their portfolio in the categories of education, it was found that the "Primary" category was significantly different from all other categories except "10th / Secondary" category. The Category of "10th / Secondary" was significantly different from all other categories except the "Primary" category. The Categories of "12th / Senior Secondary" and "Graduate" were significantly different from all other categories. The Category of "Post Graduate" was significantly different from all other categories except the "Doctorate (Ph.D)" category. The category of "Doctorate (Ph.D)" was significantly different from all other categories except the "Post Graduate" category. The

Risk Appetite or the exposure to risky assets in their portfolio increases with the education of women, which can be seen using the mean scores given in Table 5 for the various categories of education.

When the paired comparison was conducted to identify the significant differences in the mean scores of Risk Appetite or the exposure to risky assets in their portfolio in the categories of Employment Status, the mean difference of 1.503 was found in the categories of "Working" and "Non-working" categories which were significant. No significant differences were observed between the "Retired" with Working" and "Non-working" categories. The working women category had a mean score of 3.15, whereas it was 1.64 for the non-working women, as shown in Table 5. This signifies that the Employment Status affects the Risk Appetite or the exposure to risky assets in the portfolio of the women.

When the paired comparison was conducted to identify the significant differences in the mean scores of Risk Appetite or the exposure to risky assets in their portfolio in the categories of Annual Income, it was found that category "Below 2.5 Lakhs" was significantly different from all the other four categories, i.e., "2.5—5 Lakhs", "5—7.5 Lakhs", "7.5—10 Lakhs", and "More than 10 Lakhs" categories. The category of "2.5—5 Lakhs" was significantly different from all other categories except the "5—7.5 Lakhs" category. The category of "5—7.5 Lakhs" was significantly different from the "Below 2.5 Lakhs" and "More than 10 Lakhs" categories. The category of "7.5—10 Lakhs" was significantly different from the "Below 2.5 Lakhs" and "2.5—5 Lakhs" categories. The category of "More than 10 Lakhs" was significantly different from all the other categories except the "7.5—10 Lakhs" category. The Risk Appetite or the exposure to risky assets in their portfolio increases with the increase in the Annual Income of women, which can be seen using the mean scores given in Table 5 for the various categories of annual income.

When the paired comparison was conducted to identify the significant differences in the mean scores of Risk Appetite or the exposure to risky assets in their portfolio in the categories of Nature of Workplace, the category of "Finance related Industry" was significantly different from "Others/ Non-Finance related Industry" category. The women working in the finance-related industry had more risky assets in their portfolios when compared with the women working in the non-finance-related industries, which signifies that the Nature of the Workplace is an important variable that affects the risk appetite of women.

6.4 Dependence status

H₃ = *There are significant differences between the mean scores of Dependence Status or dependence on husband/ others for the various categories of demographics like Age,*

Education, Employment Status, Annual Income, and Nature of Workplace.

To test whether there were significant differences between the mean scores of Dependence Status or dependence on husband/others for the various categories of demographics like Age, Education, Employment Status, Annual Income, and Nature of Workplace, ANOVA and Welch tests were used along with the Post hoc analysis using Tuckey HSD method and Games Howell Method. Table 8 highlights the descriptives showing the Mean and Std. Deviation for the question related to the Dependence Status or dependence on husband/others.

Table 9 represents the Test of Homogeneity of Variances using the Levene test statistics for the Dependence Status or dependence on husband/others.

The P-value of 0.383 (more than 0.05) in the age category, as shown in Table 9, signifies that equal variance was assumed. Thus, one-way ANOVA was used to check whether

Table 8 Descriptives showing the Mean and Std. Deviation for Dependence Status or dependence on husband/others

Descriptives				
I am completely dependent on my husband/others while making investment decisions		N	Mean	Std. deviation
Age	18–25	67	3.36	1.534
	26–35	204	2.97	1.580
	36–45	112	3.11	1.635
	46–55	77	3.68	1.689
	56–65	40	3.75	1.660
	Total	**500**	**3.22**	**1.630**
Education	Primary	61	4.77	0.783
	10th / Secondary	28	4.82	0.612
	12th / Senior Secondary	50	3.90	1.488
	Graduate	91	3.27	1.620
	Post Graduate	214	2.62	1.502
	Doctorate (Ph.D)	56	2.34	1.297
	Total	**500**	**3.22**	**1.630**
Employment Status	Working	334	2.70	1.518
	Non-Working	160	4.37	1.227
	Retired	6	1.50	0.548
	Total	**500**	**3.22**	**1.630**
Annual Income	Below 2.5 Lakhs	199	4.27	1.257
	2.5—5 Lakhs	68	3.47	1.430
	5—7.5 Lakhs	77	2.73	1.492
	7.5—10 Lakhs	60	2.12	1.236
	More than 10 Lakhs	96	1.97	1.269
	Total	**500**	**3.22**	**1.630**
Nature of workplace	Finance related Industry (Banks/Accountant/Investment or Insurance companies)	119	1.61	0.958
	Others/Non-Finance Related Industry	243	3.35	1.456
	Total	**362**	**2.78**	**1.546**

Table 9 Test of Homogeneity of Variances using Levene Statistic for Dependence Status or Dependence on Husband/others

Test of Homogeneity of Variances				
I am completely dependent on my husband/others while making investment decisions	Levene Statistic	df1	df2	Sig
Age	1.047	4	495	0.383
Education	34.949	5	494	0.000
Employment Status	23.999	2	497	0.000
Annual Income	5.239	4	495	0.000
Nature of Workplace	70.331	1	360	0.000

there were significant differences between the mean scores of Dependence Status or dependence on husband/others for the various categories of age. Table 10 shows the results of the ANOVA test conducted to test the hypothesis for the independent variable, i.e., age.

As the *P*-value was less than 0.05, as shown in Table 10, the null hypothesis was rejected, which signifies that at least one of the categories of age differs significantly from the rest in their mean scores. For detailed analysis, a Paired comparison test was conducted by Post hoc analysis using the Tuckey HSD Method.

In the paired comparison, it was observed that mean scores of Dependence Status or dependence on husband/others in the age category of "26–35" years were significantly different from "46–55" and "56–65" categories. The age category of "36–45" years was not significantly different from other categories. The age category of "46–55" years was significantly different from the "26–35" category. The age category of "56–65" years was significantly different from the "26–35" category. The Dependence Status or dependence on their husband/others increases as the woman ages, as evidenced by the mean scores in Table 8. Younger women were less dependent on husbands/others while making investment decisions when compared with older women.

For other demographics like Education, Employment Status, Annual Income, and Nature of Workplace, the *P*-value was less than 0.05, as shown in Table 9. Equal variances were not assumed, and thus, the Welch test was used to check whether there were significant differences between the mean scores of Dependence Status or dependence on husband/others for the various categories of demographics like Education, Employment Status, Annual Income, and Nature of Workplace. Table 11 represents the results of the Welch test to test the hypothesis for the independent variables, i.e., Education, Employment Status, Annual Income, and Nature of Workplace.

As the *P*-Values were less than 0.05 for all the independent variables, as shown in Table 11, the null hypothesis was rejected, which signifies that at least one of the categories of demographics like Education, Employment Status, Annual Income, and Nature of Workplace differs significantly from the rest in their mean scores. For detailed analysis, a Paired comparison test was conducted by Post hoc analysis using the Games Howell Method.

Table 11 Results of Welch test for Dependence Status or dependence on husband/others with Independent Variables- Education, Employment Status, Annual Income and Nature of Workplace

Robust tests of equality of means

I feel confident while making my own investment decisions		Statistic[a]	df1	df2	Sig
Education	Welch	75.542	5	152.556	0.000
Employment Status	Welch	113.790	2	15.276	0.000
Annual Income	Welch	71.588	4	186.143	0.000
Nature of Workplace	Welch	183.445	1	330.148	0.000

[a]Asymptotically F distributed

When the paired comparison was conducted to identify the significant differences in the mean scores of Dependence Status or dependence on husband/others in the categories of education, it was found that the "Primary" category was significantly different from all other categories except the "10th / Secondary" category. The Category of "10th / Secondary" was significantly different from all other categories except the "Primary" category. The category of "12th / Senior Secondary" was significantly different from all other categories except the "Graduate" category. The Category of "Graduate" was significantly different from all other categories except the "12th / Senior Secondary" category. The Category of "Post Graduate" was significantly different from all other categories except the "Doctorate (Ph.D)" category. The category of "Doctorate (Ph.D)" was significantly different from all other categories except the "Post Graduate" category. The Dependence Status or dependence on husband/others decreases with the increase in education of women, which can be seen using the mean scores given in Table 8 for the various categories of education.

When the paired comparison was conducted to identify the significant differences in the mean scores of Dependence Status or dependence on husband/others in the categories of Employment Status, it was found that all the three categories of "Working", "Non-working" and "Retired" were significantly different from each other. The working women category had a mean score of 2.70, whereas it was 4.37 for the non-working women, as shown in Table 8. This signifies that working women is less dependent on their husband/others while making investment decisions.

Table 10 Results of ANOVA for Dependence Status or dependence on husband/others with Independent Variable-Age

ANOVA

		Sum of Squares	df	Mean Square	F	Sig
I am completely dependent on my husband/others while making investment decisions	Between Groups	43.098	4	10.774	4.156	0.003
	Within Groups	1283.260	495	2.592		
	Total	1326.358	499			

When the paired comparison was conducted to identify the significant differences in the mean scores of Dependence Status or dependence on husband/others in the categories of Annual Income, it was found that the categories of "Below 2.5 Lakhs" and "2.5—5 Lakhs" were significantly different from all other categories. The category of "5—7.5 Lakhs" was significantly different from all other categories except the "7.5—10 Lakhs" category. The category of "7.5—10 Lakhs" was significantly different from the "Below 2.5 Lakhs" and "2.5—5 Lakhs" categories. The category of "More than 10 Lakhs" was significantly different from all the other categories except the "7.5—10 Lakhs" category. The Dependence Status or dependence on husband/others decreases with the increase in the Annual Income of women, which can be seen using the mean scores given in Table 8 for the various categories of annual income.

When the paired comparison was conducted to identify the significant differences in the mean scores of Dependence Status or dependence on husband/others in the categories of Nature of Workplace, the category of "Finance related Industry" was significantly different from "Others/ Non-Finance related Industry" category. The women working in the finance-related industry had less dependence on husbands/others for their investment-related decisions when compared with the women working in non-finance-related industries, which signifies that the Nature of the Workplace is an important variable that affects the Dependence Status of women.

7 Findings and conclusion

The research highlighted that the investment confidence of women was affected by demographics like age, education, employment status, annual income, and nature of the workplace. As the women age, the investment confidence of the women decreases. It was found that Investment confidence increases with the education of women. The investment confidence of working women was higher when compared with non-working women. The investment confidence also increases with the increase in the Annual Income of women. Women working in the finance-related industry were found to be more confident when compared with the women working in non-finance-related industries, which signifies that the Nature of the Workplace is an important variable that affects the investment confidence of women.

The Risk Appetite or the exposure to risky assets in their portfolio was also affected by these demographics. Risk Appetite or the exposure to risky assets decreases as the women age. Aged women had less risky assets when compared with women of young age. Employment Status also affects the Risk Appetite or the exposure to risky assets in the portfolio of the women. Working women had more risky assets in their portfolio when compared with non-working women. The Risk Appetite or the exposure to risky assets in their portfolio increases with the increase in their Annual Income. The women working in the finance-related industry had more risky assets in their portfolios when compared with the women working in the non-finance-related industries, which signifies that the Nature of the Workplace is also an important variable that affects the risk appetite of women.

The Dependence Status or dependence on husband/ others while making investment decisions increases as the women age, which is evident from the findings of this research. The Dependence Status decreases with the increase in women''s education and is also affected by the employment status. Working women were less dependent on their husbands/others while making investment decisions when compared with non-working women. The Dependence Status or dependence on husband/others decreases with the increase in the Annual Income of women. Women with higher incomes depended less on their husbands/others while making investment decisions. The women working in the finance-related industry had less dependence on husbands/others for their investment-related decisions when compared with the women working in non-finance-related industries, which signifies that the Nature of the Workplace is also an important variable that affects the Dependence Status of women.

The findings of the empirical research support that the changes in demographics like Age, Education, Employment Status, Annual Income, and Nature of Workplace affect the investment confidence, risk appetite, and dependence status of women.

8 Major contribution of research

This research''s primary contribution lies in its in-depth exploration of how various demographic factors impact women''s investment confidence, risk appetite, and dependence status. It reveals that women tend to become less confident as they age, but their confidence increases with higher education, employment in finance-related sectors, and higher annual income. The nature of their workplace significantly affects their investment confidence. Similarly, risk appetite decreases with age, but it rises with higher income and for those in finance-related professions. Dependence on others for investment decisions, especially husbands or family members, tends to increase with age but decreases with higher education, employment, and income. The research offers valuable insights into how these demographic factors shape women''s financial decision-making.

9 Recommendations for further research

Longitudinal studies could be conducted to track the behaviour of women investors over time, exploring cross-cultural influences on their investment behaviours. The impact of financial literacy programs and interventions could be studied through Pre-Post assessment studies. Additionally, research can examine the influence of demographics on women"s investment attitudes. Age-specific studies, qualitative research, and analysis of social networks and the effects of government policies on women"s financial independence can also enhance our understanding of women"s investment decision-making processes and ways to empower them in the financial domain.

10 Human participants and/or animals

This article does not contain any studies involving animals and human participants performed by any of the authors.

Declarations

Conflict of interest The authors declare that they have no known conflict interests or personal relationships that could have appeared to influence the work reported in this paper. We hereby confirm that there are no relevant financial or non-financial Conflict interests to report. The authors also declare that they have no conflicts of interest.

Informed consent Informed consent was obtained from all individual participants involved in the study.

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