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# **Investor Behaviour in Mumbai's Stock Market: A Study on Gender-Based Risk Tolerance and Decision-Making Patterns**

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# **ABSTRACT:**

The behaviour of investors is affected by psychological biases and risk attitudes that can differ drastically between genders. This paper aims to examine the variations in the risk perception and decision making of educated investors in Mumbai. It highlights the extent of herding behaviour, overconfidence bias, and the disparities in risk tolerance between male and female investors. Using survey data from 202 educated individuals, the paper employs a hypothesis test which is the z-test to statistically analyse these biases across gender. The results shed light on the role of herding behaviour as it shows a significant difference in males and females while making investment choices. As such, it offers important implications for financial advisers, policymakers, and investors helping them understand the gender differences and their possible resolutions.

**Keywords** - Behavioural Finance, Herding Behaviour, Overconfidence, Risk tolerance, Hypothesis Testing

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#### 1. Introduction

Investor behaviour is a critical market driver, driving asset prices, trading turnover, and, therefore, financial stability. Traditional theories such as the Efficient Market Hypothesis (EMH) and Modern Portfolio Theory (MPT), justify their assumptions of the rationality of investors who incorporate all information into their decision-making process to achieve the best results. However, in real life, people are driven by cognitive biases, emotions and psychological factors that make them depart from the rationality that is assumed in the economic theories. This has, in turn, given rise to Behavioural Finance as a discipline that looks at the psychological aspects of financial decisions and questions the rationality assumption in conventional economic theories.

One of the important aspects of the study of behavioural finance is whether these psychological biases affect all investors or whether some demographic and psychographic factors shape financial decisions. Among them, gender has been highlighted as a possible factor that determines investment attitudes and behaviour, and the existing studies reveal differences between men and women in terms of risk perceptions, investment decisions, and financial choice-making. On average, men are more risk-seeking than women and trade more frequently, while women are more risk-averse and prefer to make long-term, stable investments. Various factors, including sociocultural norms, financial literacy, and access to financial resources, may cause these differences. Although research in this area is evolving, the effect of gender on behavioural biases in investment choices remains underexplored, particularly in emerging markets such as India. Mumbai, the financial hub of the country, provides a rich and complex venue for investors, which makes it suitable to examine gender-specific trends in investment behaviour.

The aim of this study is to establish the effect of gender on investor behaviour in Mumbai's stock market regarding risk tolerance, overconfidence bias and herding behaviour. The findings will help to advance the field of behavioural finance by offering insights into how investment decisions are influenced by gender in a real-world setting. Furthermore, the research will be useful for financial professionals, policymakers, and market participants in creating more inclusive investment strategies and financial education programs based on the target investor demographic.

Through the analysis of gender-specific behavioural patterns in investment choices, this study aims to identify the gap between theoretical finance and actual investor behaviour and, therefore, to improve the practice of financial decision-making.

#### 2. Literature Review

Behavioural finance opposes the rational behavioural investor hypothesis and suggests psychological, cognitive, and emotional reasons for people's financial decisions. Unlike, efficient market hypothesis (Fama, 1970), modern portfolio theory (Fabozzi et al., 2011) assumes that investors process all existing information in a sound manner; however, behavioural finance demonstrates that bias and measurement capacity affect the decision-making process, leading to deviation towards systematic irrationality (Kahneman & Tversky, 1979).

#### 2.1 Herding Behaviour

Herding behaviour in the financial market defines an event in which investors resolve to imitate others instead of doing their independent analysis, which ultimately leads to market inefficiencies with increased volatility. (Aqham et al., 2024;Partap Singh, 2025). This behaviour arises when investors assume that collective actions have greater informational content relative to individual judgment, so investors suppress their own judgment in favour of group consensus (Dhuri & Patkar, 2024). Such psychological factors as fear of missing out (FOMO) and social influence further strengthen this effect on investors, thus resulting in conformity to crowd behaviour instead of independent financial decisions (Ahmad & Mahmood, 2020; Kırmızıaltın, 2024). When the market

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is at its lowest, investors tend to herd others because they think that doing so lowers risk, even when they disregard the information provided by fundamental research (Zulhelfi, 2024;Kırmızıaltın, 2024). Thus, the actions create market distortion, extreme optimism or panic, further fuelling the volatility of prices and destabilizing markets (Purohit et al., 2015).

Historical market events such as the dot-com bubble and the financial crisis of 2008 illustrate how herding behaviour creates fluctuations from extremes toward which individual investment decisions drive the economy as a whole (Rana, 2024;Christie & Huang, 1995;Waweru et al., 2008;Barber & Odean, 2001)Some studies, however, note that women are often forced to conform by socio-cultural imperatives or lower financial literacy (Salem, 2017), while other research finds no significant gender-based differences in herd behaviour (Sharma, 2023). For example, in Oman, both men and women have shown susceptibility towards normative influences which demonstrate that this phenomenon is prevalent among investors (Jamil & Khan, 2016). The psychological and social factors that underlie herding need to be understood if the effects of herding on financial markets and the guidance of investors toward better informed financial decisions are to be evaluated.

#### 2.2 Overconfidence Bias

Overconfidence bias is a psychological bias leading to cognitive distortion, where people believe more in terms of their knowledge, skills, or ability to control events over investment behaviour, as highlighted by (Zhang, 2024). It expresses itself in the form of overestimation, over placement, over precision, thus giving rise to very high-risk taking and market inefficiency. Thus, in the context of financial markets, this behaviour is particularly prominent among retail investors, who constitute approximately 70% of participants in emerging markets, including the Mumbai stock market (Aqham et al., 2024). Overconfident traders tend to engage in excessive trading, expecting to outperform the market, which leads to increased trading volumes and heightened market volatility, ultimately contributing to a decline in asset prices (Lestari & Situngkir, 2025). Most times, a mismatch in market trading occurs due to misjudging risks and gains, leading to asset mispricing as investors consider irrelevant risks while ignoring crucial information, resulting in financial disintegration (Ankita Bhatia, 2024; Irvansyah & Murhadi, 2024).

In addition, the difference can further examine levels of overconfidence bias among males and females. Male investors are considered more overconfident than their female counterparts. Such over-confidence lends itself to excessive trading, alongside increased levels of financial risks (Yu, 2025). Overconfidence also promotes entrepreneurship and innovation by encouraging individuals to take risks, making them prone to financial misjudgements due to the underestimation of competition and market uncertainties (Yu, 2025). Understanding how overconfidence may influence an investment decision across genders is therefore becoming more and more crucial when assessing investor behaviour and its associated effects that follow in Mumbai's financial market.

#### 2.3 Risk Tolerance

Risk tolerance is the foundation of investment decision making which significantly varies across genders, shaping complex financial behaviors globally (Bucciol et al., 2015). While western research highlights women's lower risk tolerance (Nobre et al., 2016), India, particularly Mumbai, remains widely unexplored in this aspect of research despite its position as a financial powerhouse. The "Modern Portfolio Theory" suggests that investors optimize returns for a given level of risk (Management, 2019), while the "Prospect Theory" reveals behavioral biases, peculiarly loss aversion (Ahlström & Papadopoulos, 2024).

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Gender differences emerge from biological, psychological and sociocultural influences. Past research by (Fisher et al., 2017) links testosterone to heightened risk-taking, justifying why men exhibit greater risk tolerance, nevertheless studies indicate that risk attitudes also fluctuate based on external stimuli such as economic uncertainty and financial crises. Social conditioning further reinforces cautious financial behavior among women with long term implications for wealth accumulation and financial independence, according to (Ran et al., 2021). Research shows Indian women predominantly invest in fixed deposits, gold, and real estate due to perceived stability and societal influences while men are inclined towards equities and high-risk portfolios (Kumar & Kumar, 2020). In the Indian context, patriarchal financial structures have historically restricted women's participation in high-risk markets. However, at present, Mumbai demonstrates a growing shift: younger, financially literate women have been increasingly investing in equities, mutual funds, and cryptocurrency (Ajabnoor & Faisal, 2023).

This transition is facilitated by financial literacy programs, digital investment platforms and socio-economic empowerment which have expanded access to capital market and are reshaping traditional patterns of behavior. For instance, (Bannier & Neubert, 2016) has been rigorously investigated due to its strong correlation between increased financial literacy programs and reduced gender disparities in risk-taking behaviors across emerging markets. Additionally, workplace financial inclusion initiatives are accelerating risk tolerance among professional women. Current literature analyses gender in isolation and doesn't take into consideration impact of aspects such as overconfidence and decision biases on investment decisions which are adequately researched upon in the paper. The study also examines how herding behavior and overconfidence bias affects risk bearing abilities and in turn impacts investment decisions among men and women.

#### 3. Research Problem

This study aims to explore the prevalence and impact of herding behaviour among male and female investors in Mumbai's stock market. It seeks to examine how overconfidence influences investment decision-making and whether this effect differs by gender. Additionally, the research will assess gender differences in risk tolerance and how they shape investment choices in Mumbai's financial market.

## 4. Research Objectives

- 1. To identify the prevalence and impact of herding behaviour among male and female investors in Mumbai's stock market.
- 2. To examine the role of overconfidence in investment decision-making and its variation across genders in Mumbai.
- 3. To assess gender differences in risk tolerance and how they influence investment choices in Mumbai's financial market.

## 5. Methodology

This research follows an exploratory research design aimed at understanding gender-based differences in investor behaviour in Mumbai. The researchers collected primary data through an online survey and supplemented the online surveys with personal administered surveys. This study targeted educated investors who are actively trading in the market using a convenience sampling method. The survey was made of closed-ended questions using a five-point Likert Scale to measure herding behaviour, overconfidence bias, and risk tolerance. The questions were adapted from the research conducted by (Zainul & Suryani, 2021) to make sure that the questions were made to fit the framework of behavioural finance. A total of 202 responses were collected. A Z-test was performed on each bias to assess gender differences in investment biases and test their statistical

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significance. The findings aim to contribute to a deeper understanding of investor psychology and gender-specific decision-making patterns in Mumbai's financial market.

# **6.** Data Analysis and Findings

# 6.1 Demographic Statistics

Table 1 shown below summarises the respondents' profiles based on key characteristics such as age, gender, educational background, and occupation.

		Respondents	%
Gender	Male	110	55.30%
	Female	92	44.70%
Age	19-29	108	53.47%
	30-39	20	9.90%
	40-49	12	5.94%
	50-59	57	28.22%
	Above 60	5	2.48%
Education	High School	27	13.37%
	Bachelor's	99	49.01%
	Graduate	70	34.65%
	Associate's	9	4.46%
Occupation	Student	90	44.55%
	Part-time	15	7.43%
	Employed	48	23.76%
	Unemployed	3	1.49%
	Self-employed	46	22.77%

Table 1: Demographic Statistics

# 6.2 Z – Test Risk Tolerance

In order to test if there is a difference that is significant between male and female respondents' risk tolerance, a two-tailed Z-test for two independent samples was carried out. Six observations per group with known variances 0.076 and 0.170 for females and males, respectively, were used in conducting the test. The null and alternate hypotheses of the test were as follows:

- Null Hypothesis (H<sub>0</sub>): There is no significant difference in risk tolerance between males and females.
- Alternate Hypothesis (H<sub>a</sub>): There is a significant difference in risk tolerance between males and females.

	Female	Male
Mean	3.076	3.358
Known Variance	0.076	0.170
Observations	6	6
z	-1.390	
P(Z<=z) two-tail	0.164	
z Critical two-tail	1.960	

Table 2: Risk Tolerance Z-test Results

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The computed Z-score of -1.390 falls in the acceptance region (-1.960, +1.960), establishing that gender differential in risk tolerance is not statistically significant at the 5% significance level. The computed p-value of 0.164 is also greater than the cut-off value of 0.05, which further confirms the non-rejection of the null hypothesis.

Therefore, according to the findings, we do not reject H₀ and conclude that there is no statistically significant risk tolerance difference between males and females. This indicates that, among the sample studied, gender is not a factor in determining risk tolerance. These results are in line with the existing behavioural finance literature that implies that differences in risk tolerance may not always be generated by gender but by other moderating factors like financial knowledge, income, experience, or personality (Fisher et al., 2017).

Other factors such as increased financial literacy, greater provision of access to investment facilities, and shifting socio-economic roles could have also contributed towards diminishing traditional gender differences in risk-taking behaviour. With the increasing financial independence of women and active participation in the investment arena, their risk tolerance levels would tend to become closer to those of men. In addition, since the sample covered by the survey was predominantly made up of educated professionals, the gender difference in the risk preferences might not be too great, affirming the argument that financial literacy and stock market exposure play a greater role than gender does.

# **Overconfidence Bias**

To see whether there exists any statistically significant difference in overconfidence bias between female and male respondents, a two-tailed Z-test for two independent samples was conducted. The overconfidence bias had 5 questions on which the mean of 202 responses were taken to provide 5 observations with known variances of 0.078 and 0.130 for females and males respectively. The null and alternative hypotheses for the test are:

- Null Hypothesis (H<sub>0</sub>): There is no significant difference in overconfidence bias between males and females.
- Alternate Hypothesis (H<sub>a</sub>): There is a significant difference in overconfidence bias between males and females.

	Female	Male
Mean	3.080	3.118
Known Variance	0.078	0.130
Observations	5	5
z	-0.185	
P(Z<=z) two-tail	0.853	
z Critical two-tail	1.960	

Table 3: Overconfidence Bias Z-test Results

The calculated Z-score of -0.185 falls clearly within the region of acceptance (-1.960, +1.960) and signifies that the observed discrepancy in overconfidence bias between genders is not significant at the 5% significance level. Moreover, the obtained p-value of 0.853 is very much greater than the threshold value of 0.05 and supports the rejection failure of the null hypothesis.

Therefore, according to the findings, we are unable to reject H₀ and conclude that no statistically significant overconfidence bias exists between males and females. These findings suggest that

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overconfidence bias, which is one of the most significant behavioural traits influencing financial decision-making, lacks gender-based differences in the given sample. This may be due to the same degree of financial literacy, market information availability, and investment experience for both genders, thus having the same level of confidence in their ability to make sound decisions (Shaikh et al., 2019). The results are consistent with previous research that indicated that while there might be gender differences in confidence in particular situations, they could be eliminated when tested within more general frameworks of financial decision-making. Besides, with the opening up of financial markets to include women and more inclusive markets overall, gender stereotypes regarding men showing higher overconfidence might cease to apply, particularly in cities where men and women actively invest.

# **Herding Behaviour**

To understand if there is a significant difference in herding behaviour between different genders, a two-tailed Z-test was performed. The analysis was conducted using seven questions which were part of the herding behaviour bias, with known variances of 0.015 for females and 0.043 for males. The hypotheses for the test are defined as follows:

- Null Hypothesis (H<sub>0</sub>): There is no significant difference in herding behaviour between males and females.
- Alternate Hypothesis (H<sub>a</sub>): There is a significant difference in herding behaviour between males and females.

	Female	Male
Mean	3.016	2.773
Known Variance	0.015	0.043
Observations	7	7
z	2.667	
P(Z<=z) two-tail	0.008	
z Critical two-tail	1.960	

Table 4: Herding Behaviour Z-test Results

The calculated Z-score value of 2.667 is above the critical value of  $\pm 1.960$ , which confirms that the given difference in males' and females' herding behaviour is significant at the 5% significance level. Further, the obtained p-value value of 0.008 is much less than the significance level of 0.05, which again confirms the rejection of the null hypothesis.

Therefore, we reject H₀ and conclude that there is a statistically significant difference in herding behaviour between females and males. This suggests that, within the sample in question, gender plays an important role in the herding behaviour. These findings are in consonance with current behavioural finance literature, according to which females tend to have increased herding behaviour due to increased perceived uncertainty in financial choices, increased social network dependence, and a preference for group decision-making (Zheng et al., 2021).

One such hypothesis is that, on average, women are more likely to desire external approval and be influenced more by market sentiments while making their investment decisions compared to men who might be inclined towards more individualistic decision-making. Furthermore, if women regard financial markets as being difficult or uncertain, then they are more likely to track expert views, peer suggestions, or current market mood.

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# 7. Limitations and Future Research Agenda

While the present study does offer significant insights into the gender-based disparities in investment pattern among educated investors in Mumbai, it should be noted that there exist certain limitations that could affect the generalizability and interpretation of the results.

- Sample Bias The research's concentration on educated investors living in Mumbai restricts
  the sample's diversity. This urban, comparatively financially aware population might not
  represent the wider investor base in India, especially in rural or semi-urban regions. Future
  research needs to employ a more demographically representative sample to boost external
  validity.
- 2. Dependence on Self-Reported Information Information gathered using questionnaires has inbuilt self-reporting biases. Respondents may provide socially desirable answers or inaccurately recall past investment decisions. Employing complementary methods such as behavioural experiments or observational studies could offer a more objective assessment of investor behaviour.
- 3. Potential Confounding Variables Investor behaviour can be influenced by various factors such as income, age, financial literacy, employment sector, and marital status. While gender was the primary variable of interest, the absence of control for these confounding factors may affect the validity of the conclusions. Future research should employ multivariate analysis techniques to isolate the impact of gender from other variables.
- 4. Statistical Constraints of the Z-Test While the z-test is suitable for comparing differences between two groups, it assumes a large sample size and normal distribution. Unless these conditions are rigidly fulfilled, the results can be imprecise. Subsequent research could investigate the application of stronger statistical methods, for example, logistic regression or non-parametric tests, to confirm the outcomes.
- 5. Limited Behavioural Dimensions Three particular biases—herding behaviour, overconfidence, and risk tolerance—are the focus of this study, excluding other important psychological factors like loss aversion, anchoring, and mental accounting. Broader future investigations can incorporate a wider spectrum of biases to capture a more comprehensive picture of investor psychology.

In conclusion, while this study contributes meaningfully to the growing field of behavioural finance in emerging markets, addressing the above limitations in future research will help deepen the understanding of gender-specific investment behaviour and support the development of more nuanced financial advisory models.

## 8. Conclusion & Recommendations

This research focused on gender as the moderating factor of investment behaviour in the stock market of Mumbai and three behavioural biases, namely, risk tolerance, overconfidence bias, and herding behaviour. The findings suggest that gender is not a significant affecting factor for risk tolerance and overconfidence bias, which indicates that investment decisions in these areas may have been influenced more by factors such as financial literacy, experience, and personality rather than gender alone. Herding was however significantly differentiated when it came to statistical testing, with the men being less likely to be influenced by collective investment behaviours. This implies that socio-psychological characteristics such as risk acceptance and group consensus are affecting male and female investment behaviour in a dissimilar way. Hence, these results give evidence to the field of behavioural finance in highlighting the fine nuances of gender differences in investment decision-making, especially in city like Mumbai that classifies as an emerging market. The findings may aid finance professionals, policymakers, and educators in furthering their efforts toward developing gender-aware financial education and investment strategies.

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Future studies should include bigger samples, industry data, or other psychological factors to extend the understanding of how biases affect investor behaviour. The results of the study show that psychological and social factors influence investment decisions and suggest that market education and financial advisory services could help mitigate excessive reliance on herd behaviour.

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