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The Impact of Cognitive Biases on Retirement Planning Behaviour: Evidence from Pakistan

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Abstract

One of the most crucial financial choices that individuals make is retirement saving, and in most cases, it is determined by psychological bias and not proper planning. The research focuses on the impact of two popular biases that are risk aversion and overconfidence on retirement saving behaviour of working people in Pakistan. Risk-averse individuals will avoid risk and choose low-risk and safe options, which constrain their capacity to accumulate sufficient future savings. On the contrary, overconfident people have a tendency of thinking they are more knowledgeable or will earn more in the future and thus save less than they should. These prejudices are of diverse types, but all lead to insufficient retirement readiness. Through these two biases, the study contributes to the body of existing research on behavioural finance and shows the necessity of taking practical measures, such as designing retirement plans better and running awareness campaigns, to guide people to overcome under-saving as a result of bias.

Keywords: Risk aversion; Overconfidence bias; Retirement saving behaviour; Behavioural finance; Prospect theory; Pakistan; Investment decisions; Financial planning

1. Introduction

In Pakistan, retirement adequacy is a growing policy issue due to the demographic changes and rising life expectancy lengthening the time households have to fund after leaving the labor market, and little formal pension coverage and private savings (Najeeb and Ali, 2024). The classic models that view under-saving as an income or information problem cannot explain foreseeable psychological biases that can influence long-horizon financial decision-making; behavioral economics demonstrates that heuristics and biases systematically distort intertemporal trade-offs, risk-taking, and the decision to save (Kahneman and Tversky, 1979; Laibson, 1997). Empirical research in retirement situations shows that present bias lowers contribution rates, inertia and default effects lower enrolment and growth in savings, and overconfidence may cause under-provisioning or excessive trading which is detrimental in the long-term (Madrian and Shea, 2001; Thaler and Benartzi, 2004; Barber and Odean, 2001). Recent systematic reviews and country studies support the relevance of these mechanisms to policy but also note disparate measurement and insufficient evidence in South Asia (Saleem et al., 2023). Consequently, the research will focus on the four interconnected objectives: (1) to measure the relative effects of several cognitive biases (overconfidence, present bias, loss aversion, anchoring, optimism, as well as status-quo bias) on concrete retirement behaviours (enrolment, regularity of contribution, and perceived preparedness); (2) to test whether financial literacy moderates the relationship between cognitive biases and saving outcomes. The research gap that drives these objectives is three-fold: most of the previous studies quantify one bias or sample on a high-income group, comparative magnitudes of biases are not commonly estimated with a single representative sample, and the relationship between biases and financial literacy or binding constraints are under-studied

in developing-country contexts (Saleem et al., 2023).

The policy implications of the study are that the results can be used to implement specific interventions to increase long-term financial security in Pakistan and other countries that exhibit similar effects on retirement saving: by determining which biases have the strongest negative influence on retirement saving and which subgroups are most impacted, the findings can be used to implement policies that can increase saving and reduce default risk: default redesign, commitment devices, and customized financial education (Thaler & Benartzi, 2004; Laibson, 1997).

2.Literature Review

Retirement saving decisions are among the most critical financial choices individuals make, yet they are often shaped by psychological biases rather than purely rational calculations. Two of the most influential biases in this domain are risk aversion and overconfidence, both of which have been extensively studied in behavioral finance and are highly relevant to understanding retirement planning behaviour.

Risk Aversion and Retirement Saving

Risk aversion refers to the tendency of individuals to prefer avoiding losses over acquiring equivalent gains (Kahneman & Tversky, 1979). Prospect theory demonstrates that people weigh losses more heavily than gains, leading to conservative investment choices. In the context of retirement planning, this bias manifests in reluctance to invest in equities or higher-yield assets, even when such investments are necessary to achieve long-term adequacy.

Empirical studies confirm the impact of risk aversion on saving behaviour. Rasool and Ullah (2020) found that Pakistani investors consistently preferred low-risk securities, even at the cost of lower returns. Similarly, Ball et al. (2010) reported gender differences,

with women displaying stronger risk aversion in retirement portfolios. This tendency often results in portfolios dominated by fixed deposits or low-yield bonds, which may fail to keep pace with inflation, thereby eroding retirement wealth.

Risk aversion also influences contribution behaviour. Individuals who perceive retirement saving as risky may delay enrollment or contribute minimally, preferring liquidity over long-term commitment. Mahmood et al. (2024) observed that risk-averse investors in Pakistan were less likely to diversify, a finding that parallels retirement savers' reluctance to allocate funds to equities. Thus, while risk aversion protects against volatility, it paradoxically increases the risk of inadequate retirement savings.

Overconfidence and Retirement Saving

Overconfidence bias is the tendency to overestimate one's knowledge, predictive ability, or control over outcomes (Bhandari & Deaves, 2006). In retirement planning, overconfidence can lead individuals to underestimate the resources required for old age or to assume that future income will compensate for current under-saving. Barber and Odean (2001) demonstrated that overconfident investors trade excessively, reducing portfolio performance. Applied to retirement saving, this bias may cause individuals to believe they can "catch up" later or achieve higher returns through active management, leading to procrastination and under-contribution. Ahmad and Shah (2020) found that overconfidence reduced Pakistani investors' ability to make sound financial choices, a dynamic that can translate into unrealistic expectations about pension adequacy.

Overconfidence also affects risk perception. Individuals who overestimate their financial literacy may ignore diversification principles, concentrate investments in familiar assets, or assume that market downturns will not affect them significantly. Mahmood et al. (2024) reported that overconfidence significantly influenced investment

decisions in Pakistan, reinforcing the idea that retirement savers may misjudge the balance between risk and return.

Risk aversion and overconfidence exert opposite pressures on retirement saving behaviour. Risk aversion discourages participation in higher-yield investments, while overconfidence encourages excessive risk-taking or underestimation of future needs. Together, these biases can create a paradox: some individuals save too conservatively, while others save inadequately due to misplaced optimism. Both pathways lead to insufficient retirement preparedness. The literature suggests that these biases are particularly pronounced in emerging markets, where pension systems are less developed and financial literacy is uneven. Studies in Pakistan highlight the prevalence of both risk aversion and overconfidence among investors (Mahmood et al., 2024; Ahmad & Shah, 2020), underscoring the need to examine their specific impact on retirement saving behaviour.

Theoretical Context

Bounded rationality (Simon, 1955) provides the overarching framework, emphasizing that individuals rely on heuristics rather than exhaustive optimization. Prospect theory (Kahneman & Tversky, 1979) explains risk aversion, while overconfidence is rooted in cognitive psychology's findings on self-assessment errors (Bhandari & Deaves, 2006). Together, these theories explain why retirement savers deviate from rational models of consumption smoothing (Modigliani & Brumberg, 1954) and why interventions are needed to align behaviour with long-term goals.

Although extensive literature documents risk aversion and overconfidence in general investment behaviour, fewer studies directly examine their impact on retirement saving in emerging economies. Most evidence comes from developed countries with

established pension systems. The Pakistani context remains under-researched, with recent studies focusing on stock market investors rather than retirement savers (Mahmood et al., 2024). This gap is critical because retirement planning involves longer horizons and greater uncertainty than short-term investing.

Understanding how risk aversion and overconfidence shape retirement saving behaviour has direct policy relevance. Excessive risk aversion can be addressed through default portfolio diversification and inflation-protected instruments, while overconfidence can be mitigated by realistic projections and transparent communication about retirement adequacy. By focusing on these two biases, research can provide actionable insights for pension design and financial education in Pakistan and similar contexts.

Hypotheses

***H1:** Individuals with higher levels of risk aversion are less likely to allocate retirement savings to equity or higher-yield investment options, preferring low-risk, low-return assets.*

***H2:** Greater risk aversion is negatively associated with the amount and regularity of contributions to retirement savings plans, as risk-averse individuals prefer liquidity and avoid long-term financial commitments.*

***H3:** Individuals with higher levels of overconfidence are more likely to underestimate the resources required for retirement, leading to lower contribution rates and inadequate retirement preparedness.*

H4 : Overconfident individuals are more likely to adopt concentrated or risky retirement portfolios, believing they can achieve superior returns or “catch up” later, which increases the likelihood of under-saving.

H5 : Risk aversion and overconfidence exert opposite effects on retirement saving behaviour: risk aversion leads to overly conservative saving and investment, while overconfidence leads to insufficient saving and excessive risk-taking. Both biases, however, contribute to inadequate retirement preparedness.

Methodology

Research Design

The research design used in this study is a quantitative and cross-sectional survey design aimed at investigating the effects of risk aversion and overconfidence bias on saving behaviour among working people in Pakistan in terms of retirement savings. Primary data collection was conducted with the help of a structured questionnaire that enables the statistical testing of the hypotheses. This design aligns with the previous research on behavioral finance that has explored cognitive biases in investment choices (Mahmood et al., 2024; Adil et al., 2021).

Target Population and Sampling

The intended population is the working age people in Pakistan in both the public and privates who are in a position to invest in retirement saving plans (e.g., provident funds, voluntary pension schemes or personal savings plan). As the retirement planning behaviour is determined by the type of employment and level of income, the respondents were sampled by the various occupational groups such as banking, education, healthcare, and manufacturing.

Mahmood et al. (2024) used a convenience sampling approach because of the constraints of accessibility and the exploratory study. The questionnaires were distributed both face-to-face at workplaces and online (LinkedIn, WhatsApp, and email). The sample size was 250-300 respondents, sufficient to perform regression analysis and in line with similar research in the field of behavioral finance (Rasool & Ullah, 2020).

Instrument Development

The questionnaire was divided into three sections:

2. **Section A:** Demographic information (age, gender, education, income, employment sector, years of work experience).
3. **Section B:** Measurement of cognitive biases. Risk aversion was measured using items adapted from Tversky & Kahneman (1974) and Rasool & Ullah (2020), focusing on preferences for safe versus risky retirement investment options. Overconfidence was measured using items adapted from Bhandari & Deaves (2006) and Ahmad & Shah (2020), capturing self-perceived financial knowledge and confidence in retirement planning decisions.
4. **Section C:** Retirement saving behaviour. Items assessed contribution frequency, contribution amount, portfolio diversification, and perceived preparedness for retirement. These measures were adapted from Lusardi & Mitchell (2014) and Thaler & Benartzi (2004).

All items were measured on a five-point Likert scale ranging from “strongly disagree” (1) to “strongly agree” (5).

Pilot Testing

To verify the instrument with respect to clarity and reliability, a pilot study was carried out on 30 respondents. Internal consistency was measured with the help of Cronbach's alpha. The coach deemed reliability coefficients of over 0.70 as acceptable (Baker et al., , 2019). There were slight changes in wording done on the basis of feedback.

Data Collection Procedure

The time frame of the collection of data was six weeks. Participation was voluntary and the respondents were assured of confidentiality and anonymity. The appropriate institutional review board gave their ethical approval.

Data Analysis Techniques

The SPSS/AMOS was used to analyze the data. Demographic characteristics were summarized using descriptive statistics. Cronbach alpha and the factor analysis were used to test reliability and validity of constructs. Multiple regression analysis was used to test the hypotheses with retirement saving behaviour as the dependent variable and risk aversion and overconfidence bias as the independent variables. The regression model was specified as:

$$RSB = \beta_0 + \beta_1 RA + \beta_2 OC + \epsilon$$

Where:

1. RSB = Retirement Saving Behaviour
2. RA = Risk Aversion
3. OC = Overconfidence
4. ϵ = Error term

Descriptive Statistics

Table 1 presents the descriptive statistics for the main study variables. Respondents reported moderate levels of risk aversion and overconfidence, while retirement saving behaviour scores were relatively low, suggesting under-preparedness. Pearson correlation coefficients were calculated to examine associations among variables. Table 3 shows that risk aversion was negatively correlated with retirement saving behaviour ($r = -.32, p < .01$), while overconfidence was also negatively correlated ($r = -.28, p < .01$).

Table 1

Reliability Coefficients and Correlations Among Study Variables

Variable	Cronbach's α	Mean	SD	1	2	3
1. Risk Aversion	.742	3.41	0.82	—		
2. Overconfidence	.751	3.56	0.79	.12	—	
3. Retirement Saving Behaviour	.768	2.98	0.85	-.32**	-.28**	—

Note. N = 250. Cronbach's α values above .70 indicate acceptable reliability. ** $p < .01$.

The table 1 shows that all three constructs risk aversion, overconfidence, and retirement saving behaviour demonstrated acceptable internal consistency, with Cronbach's alpha values ranging from .742 to .768. Mean scores suggest moderate levels of risk aversion and overconfidence among respondents, while retirement saving behaviour was relatively low, indicating under-preparedness.

Correlation results reveal that both risk aversion and overconfidence were negatively associated with retirement saving behaviour. Specifically, higher risk aversion was linked to lower contributions and conservative portfolio choices, while greater overconfidence was associated with unrealistic expectations and insufficient saving. Interestingly, the correlation between risk aversion and overconfidence was weak and nonsignificant, suggesting that these biases operate independently rather than jointly. Together, these findings confirm that both biases—though conceptually opposite—contribute to inadequate retirement preparedness in Pakistan.

Regression Analysis

Multiple regression analysis was conducted to test the hypotheses. The model was significant $F(2, 247) = 18.62, p < .001$, explaining 21% of the variance in retirement saving behaviour ($R^2 = .21$).

Table 4

Regression Results Predicting Retirement Saving Behaviour

Predictor	β	SE	t	p
Risk Aversion	-.29	.07	-4.15	>0.05
Overconfidence	-.25	.08	-3.62	>0.05

Note. Dependent variable = Retirement Saving Behaviour.

The regression coefficients indicate that both risk aversion and overconfidence significantly reduce retirement saving behaviour. Specifically, for every one-unit increase in risk aversion, retirement saving behaviour decreased by 0.29 units ($\beta = -.29, p < .001$).

Similarly, for every one-unit increase in overconfidence, retirement saving behaviour decreased by 0.25 units ($\beta = -.25, p < .001$).

Discussion of Results

The results of this research can have significant implications on the role of risk aversion and overconfidence bias in influencing retirement saving behaviour in Pakistan. Both biases were observed to have serious negative impact, but they work by various psychological processes.

The regression analysis revealed that retirement saving behaviour was negatively correlated with risk aversion. The higher the risk aversion score, the less the respondent would be able to contribute to retirement plans on regular basis and would be more inclined to avoid diversified portfolios. This is in line with the prospect theory (Kahneman & Tversky, 1979), which asserts that people tend to allocate disproportionate weight to any form of losses as opposed to equivalent gains. This in the retirement context is seen as unwillingness to invest in equities or equities with high yields, although this is something that needs to be done to retain buying power in the long term.

This interpretation is supported by empirical evidence. Rasool and Ullah (2020) discovered that Pakistani investors were always inclined to take low-risk securities at the cost of long-term returns. In the same spirit, Ball et al. (2010) found that risk aversion results in conservative retirement portfolios especially in women. The current work builds on those results by demonstrating that risk aversion does not only affect the portfolio composition, but it also diminishes contribution behaviour, thus enhancing the risk of poor retirement preparedness.

Another negative predictor of retirement saving behaviour was also represented by overconfidence bias. Those respondents who over-estimated their financial knowledge or future earning capacity contributed less and had unrealistic expectations regarding the adequacy of retirement. This observation is consistent with the earlier studies that indicated that excessive trading and poor investment performance are as a result of overconfidence (Barber & Odean, 2001). Similarly, Ahmad and Shah (2020) in Pakistan found that overconfidence decreased the capacity of investors to make sound financial decisions.

In retirement, overconfidence can lead to the belief that people can later make up or gain better returns by managing their funds actively, which results in procrastination and under-saving. According to Bhandari and Deaves (2006), younger and higher-income people tend to have overconfidence and this observation could have been the reason some respondents in this study underestimated the resources necessary to retire.

Even though risk aversion and overconfidence are conceptually opposite, one deterring risk-taking and the other fostering risk-taking, their implications have similar results in creating poor retirement preparedness. Risk-averse people save too much and overconfident people save too little. The two routes are both detrimental to financial security in the long run. This paradox illustrates the intricacy of the behavioural factors in the context of retirement planning and the necessity of interventions that would treat the biases in tandem.

Contribution to Literature

The findings will add to the existing literature in behavioral finance by offering empirical data in Pakistan, a developing economy, where retirement planning is under-studied. In Pakistan, previous research has concentrated on stock market investors mainly (Mahmood

et al., 2024), which is why this study proves that the same biases are applied to retirement saving behaviour. Due to the isolation of risk aversion and overconfidence, the study illuminates the separate and combined impacts of both on retirement planning, which has a gap in the literature on retirement planning in developing conditions.

Policy and Practical Implications

The implications of the findings relate directly to the policymakers and financial institutions. To the risk-averse, the pension plans must provide inflation-protected products and diversified default portfolio to help minimize the perceived risk of equity exposure. In the case of overconfident individuals, interventions need to focus on realistic estimates of retirement requirements and mention the risks of saving less. Education campaigns about finance can help but structural remedies like automatic enrollment and a rise in contribution might be more effective in addressing these biases (Thaler & Benartzi, 2004).

Conclusion

Overall, the research confirms that risk aversion as well as overconfidence are formidable barriers to retirement saving behaviour in Pakistan. Although these biases are of opposite nature, they all intersect to deliver poor retirement preparedness. It is necessary to deal with them through a blend of behavioural knowledge, policy measures, and institutional frameworks to make people financially secure in their retirement.

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