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PSYCHOLOGICAL FACTORS AFFECTING INVESTORS DECISION MAKING

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Abstract: The paper investigates the psychological factors influencing investors' decision-making processes, with a particular focus on how biases affect risk tolerance and investment decisions. Utilizing a comprehensive methodology that includes ANOVA, regression, and correlational analysis, this study examines the effects of biases such as overconfidence, anchoring, herd behaviour, regret aversion and optimism biases on investment decisions. The research findings reveal significant correlations between these psychological biases and investor behaviour, highlighting their impact on risk assessment and decision-making strategies.

To ensure the reliability of the research tools, a Cronbach's Alpha test was conducted, confirming the consistency of the instruments used. The study's results challenge the traditional notion that states that investment decisions are driven solely by logical reasoning and underscoring the substantial influence of emotional and cognitive biases. These insights contribute to the field of behavioural finance by enhancing understanding of the psychological underpinnings in investment decision-making and suggesting practical applications for financial education and advisory services.

The paper advocates for the inclusion of psychological bias recognition in investor education, proposing that such an approach can significantly improve decision-making and lead to better investment outcomes. The implications of this research extend beyond individual investors to financial advisors and policymakers, offering them a foundation to develop strategies and regulations that help mitigate bias-driven investment mistakes, ultimately fostering greater financial well-being and market efficiency.

Keywords: Investor Decision Making, Risk Tolerance, ANOVA, Regression Analysis, Correlational Analysis, Overconfidence Bias, Anchoring Bias, Herd Behaviour Bias, Regret Aversion Bias, Optimism Bias, Behavioural Finance.

Introduction:

Investment decision-making is a complex process influenced by a range of factors, including economic indicators, market trends, and significantly, the psychological attributes of investors. While extensive research has focused on the economic determinants of investment decisions, the psychological aspects, particularly cognitive and emotional biases, have received comparatively less attention. This study addresses this gap by exploring the impact of psychological factors on investment decisions, with a specific focus on biases such as overconfidence, anchoring, herd behaviour, regret Aversion and optimism Bias.

The rationale for this research stems from the observation that psychological biases can significantly deviate investors' behaviours from rational decision-making models, potentially leading to suboptimal financial outcomes. By integrating theories from behavioural finance and empirical analysis, this paper aims to provide a deeper understanding of how various biases influence risk tolerance and decision-making processes among investors.

This research is particularly relevant for financial advisors and individual investors, as it emphasizes the importance of recognizing and mitigating psychological biases to improve investment outcomes. For financial professionals, understanding these biases can enhance their ability to provide tailored advice, thereby improving client service and investment strategies. For individual investors, this knowledge can lead to more informed and rational investment decisions.

The methodological approach of this study involves quantitative analysis, including ANOVA, regression, and correlation analysis, to assess the effects of psychological biases across different demographics. This comprehensive analysis not only contributes to academic literature by confirming and extending existing theories but also offers practical insights that can be applied in financial education and advisory practices.

Research Question:

How do psychological biases, specifically overconfidence, anchoring, and Herd behaviour, regret aversion and optimism biases influence the risk tolerance and decision-making processes of individual investors, and how do these effects vary across different demographic groups?

Literature Review:

- **Ahmad and Wu (2024)** investigate the impact of heuristic-driven biases on individual investors trading on the Pakistan Stock Exchange (PSX). Utilizing a qualitative methodology, the researchers conducted semi-structured interviews with five brokers and investment advisors. Their findings reveal that investors frequently rely on recognition and cognitive heuristics such as alphabetical ordering, name fluency, herding behaviour, and overconfidence, which significantly impair investment decisions and performance. This study uniquely contributes to financial literature by outlining a practical framework to understand and mitigate the negative effects of heuristic biases, aiming to enhance investment management practices.

- **Jain, Walia, Kaur, and Singh (2022)** focuses on the requirement for an accurate measurement of behavioural biases influencing the choices made by investors. Through a comprehensive analysis of existing literature, in-depth interviews with stockbrokers, and rigorous multi-phase testing, this study effectively creates a scale to measure biases including overconfidence, representativeness, and availability bias, among others. This scale represents a significant improvement in behavioural finance, giving academics and practitioners a useful instrument to evaluate the impact of psychological variables on investing behaviour. It was created and validated using data from 332 individual stock investors. This novel method makes a significant addition to the study of financial decision-making processes by

improving our knowledge of how biases affect investment decisions and providing new opportunities for reducing their negative impacts.

- **Robba, M. P., Sorgente, A., Miccoli, M. R., & Iannello, P. (2022):** The paper titled "Is financial literacy enough to explain investment decisions? Understanding the role of psychological characteristics" by Matteo Paolo Robba, Angela Sorgente, Maria Rosa Miccoli, and Paola Iannello explores the influence of psychological characteristics on investment decisions alongside financial literacy. The study, conducted on a representative sample of 1,110 individuals, analyses how socio-demographic factors, financial literacy, financial self-efficacy, risk attitude, and impulsivity affect the likelihood of participating in financial markets. The results indicate that while financial literacy is a significant factor, psychological traits such as risk tolerance, financial self-efficacy, and impulsivity also substantially impact investment decisions. This suggests a more nuanced approach to understanding financial behaviours is necessary, where both financial literacy and psychological factors are considered.
- **Kartini, K., & Nahda, K. (2021)** explore the impact of both cognitive and emotional behavioural biases on the investment decisions of individual investors in Yogyakarta, Indonesia. Their research marks a significant shift from traditional financial theories to behavioural finance, particularly focusing on how cognitive functions and emotions influence financial choices. The study examines cognitive biases such as anchoring, representativeness, loss aversion, overconfidence, and optimism, alongside the emotional bias of herding behaviour. Using a quantitative approach with a snowball sampling technique, the researchers collected data through 165 questionnaires completed by individual investors.
- **Al-Kandari, A. M., & Abul, S. J. (2020):** The paper titled "Financial Liberalization and Kuwaiti Stock Market Behaviour" by Ahmad M. Al-Kandari and Sadeq J. Abul investigates the effects of financial liberalization on the volatility of the Kuwait Stock Exchange (KSE). Utilizing ARCH, GARCH, and TGARCH models, the study examines the changes in market volatility before and after significant regulatory changes from 2014 to 2018 intended to upgrade KSE to an emerging market status. The findings suggest that liberalization decreased the volatility of KSE, primarily due to increased foreign investment inflows and improved regulatory structures. The authors argue that financial liberalization has led to a more stable market environment in Kuwait, attracting more foreign investments and reducing market volatility.
- **Sattar, M. A., Toseef, M., & Sattar, M. F. (2020)** The paper titled "Behavioural Finance Biases in Investment Decision Making" by Muhammad Atif Sattar, Muhammad Toseef, and Muhammad Fahad Sattar, explores the impact of psychological biases on investment decisions. The study, published in 2020, delves into how traditional finance theories, which presume rational decision-making, are challenged by behavioural finance that incorporates psychological factors affecting decisions under uncertainty. The authors identify various behavioural phenomena such as overconfidence, anchoring, herding, and others that influence investors. They utilized a survey questionnaire and regression analysis to conclude that investment decisions are significantly influenced by these heuristic behaviours. The paper highlights the importance for investors and financial institutions to consider these psychological factors in their decision-making processes.

- **Nur Ainia, N. S., & Lutfi, L. (2019):** The study conducted by Nadya Septi Nur Ainia and Lutfi Lutfi (2019) investigates the effects of risk perception, risk tolerance, overconfidence, and loss aversion on investment decision-making. This research involved 400 respondents from Surabaya and Jombang in East Java, using the Partial Least Square-Structural Equation Model (PLS-SEM) for data analysis. The findings highlight that risk perception negatively influences investment decisions, while risk tolerance and overconfidence have a positive effect. However, loss aversion did not show any significant impact on investment decisions. This study contributes to understanding how different behavioural factors affect financial decision-making, particularly in the context of Indonesian investors.
- **Metawa, N., Hassan, M. K., Metawa, S., & Safa, M. F. (2019):** In their 2019 study, Metawa, Hassan, Metawa, and Safa explore the influence of investors' demographic characteristics—such as age, gender, education

level, and experience—on their investment decisions in the Egyptian stock market, with a focus on behavioural factors like sentiment, overconfidence, overreaction, underreaction, and herd behaviour as mediators. Utilizing data from a structured questionnaire survey of 384 investors, including local Egyptians and foreigners as well as institutional and individual investors, the researchers applied partial multiple regression analysis. Their findings reveal that behavioural factors significantly affect investment decisions. Specifically, age, gender, and education level significantly positively influence investment decisions, while experience has an insignificant direct effect but contributes to reducing the impact of emotional factors on decision-making. This study highlights how demographic variables can shape investment behaviour through psychological traits, shedding light on investor behaviour in under-researched markets like Egypt.

- **Devi, S., & Karthikeyan, G. (2018**): delve into the influence of behavioural finance on the decision-making processes of investors. Their study, which surveyed 600 participants, utilizes factor analysis to understand how psychological factors impact investment behaviours. The researchers applied principal component analysis, successfully condensing 16 behavioural variables into five distinct factor models: Market Dynamics, Logical Analysis, Herding Bias, Regret Aversion, and Heuristic Bias. These factors illustrate the significant ways in which psychological and cognitive biases shape investor behaviour in financial markets. The findings highlight the growing importance of behavioural finance in guiding investor decisions, emphasizing that understanding these biases can lead to more informed and rational investment strategies. The study contributes to the broader discourse on how psychological insights are integral in financial decision-making, advocating for a more nuanced approach to investing those accounts for human behaviour.
- **Chhapra, Kashif, Rehan, and Bai (2018)** explores the field of behavioural finance, concentrating on the ways that behavioural biases affect investors' financial decision-making. By objectively investigating the irrational behaviours that can influence investment decisions away from traditional financial theories, which frequently assume rationality among market participants, their work, which was published in the Asian Journal of Empirical Research, stands as a significant contribution to the body of existing literature. This study examines the frequency of many significant behavioural biases among investors, including overconfidence, anchoring, herding, and loss aversion. The authors hope to clarify how much these biases might skew judgment and decision-making in financial situations by conducting a thorough investigation. They collect data using a mixed-methods strategy to show the significant influence these biases have on investing tactics and results. The study's conclusions have important theoretical and practical ramifications. The provision of empirical information about the impact of psychological elements on investing decisions theoretically enhances the body of research on behavioural finance. In practical terms, it highlights the need for ways to reduce the consequences of these biases, which provides insights for investors, financial advisers, and legislators. This study emphasizes how crucial it is to recognize and deal with behavioural biases to improve the effectiveness of financial decision-making.
- **Lubis, H., Kumar, M. D., Ikbar, P., & Muneer, S. (2015):** The paper titled "Role of Psychological Factors in Individuals' Investment Decisions" by Hasrita Lubis and others examines how psychological factors, such as defence mechanisms, personality traits, emotional intelligence, and financial literacy, influence the criteria for investment decisions, categorized into risk, repay, and corporate data. Conducted through a survey among private bank customers, the study found significant impacts of these psychological variables on investment decision-making. Key findings include the prominent role of defence mechanisms and certain personality traits in influencing risk assessment, while financial literacy notably affects the repay criteria. Emotional intelligence was also a significant factor in evaluating corporate data, illustrating the complexity of financial decision-making processes influenced by individual psychological factors.
- **K. Parimalakanthi & Dr. M Ashok Kumar (2015):** explore the investment behaviours and preferences of individual investors in Coimbatore city within the context of various financial market options available in India. The study highlights that the primary considerations for these investors are the safety of the principal amount, liquidity,

income stability, and capital appreciation. The research encompasses a diverse range of investment avenues, including savings and fixed deposit accounts, government and corporate securities, insurance policies, real estate, commodities, shares, mutual funds, chit funds, and precious metals like gold and silver. The findings suggest a strong preference among Coimbatore's investors for bank deposits, which is closely followed by investments in gold and silver, reflecting a conservative investment strategy that prioritizes safety and liquidity. This preference indicates a general inclination towards minimizing risk while seeking moderate returns, aligning with the investment adage "no pain, no gain," which the paper interprets as a balance between accepting some risks for potential higher returns. The study offers valuable insights into the risk aversion and investment patterns typical of investors in a developing economic context like Coimbatore.

- **Mouna, A., & Anis, J. (2014)**: explore the influence of investor sentiment and cognitive biases on the investment decisions and portfolio returns of small investors in the emerging Tunisian stock market. Utilizing logistic regression analyses, the study examines the relationship between behavioural biases and portfolio performance based on data collected from 178 active small investors through a detailed questionnaire. The research findings reveal that behavioural biases, specifically anchoring, familiarity, age, and experience, significantly affect portfolio returns. The study highlights the detrimental impact of reliance on sentiment in financial decision-making and underscores the importance of financial literacy and experience. The authors recommend that investors base their decisions on financial capability rather than sentiment and suggest that the government should initiate training programs to enhance the financial literacy and competency of individual investors.
- **Chu, W., Im, M., & Jang, H. (2012):** delve into the intricate interplay between overconfidence and emotion regulation in investment decisions. Their research underscores how overconfident investors are inclined to engage in higher trading volumes and are more susceptible to the disposition effect—an inclination to sell winning investments prematurely to lock in gains and hold onto losing investments to avoid realizing losses. The study elucidates that overconfidence amplifies emotions such as pride, which encourages taking profits prematurely, and shame, which deters accepting losses. These emotions exacerbate the disposition effect, traditionally associated with loss aversion and poor self-control. Additionally, the authors reveal that overconfident investors exhibit a stronger illusion of control, further influencing their trading behaviour and leading to suboptimal investment outcomes. This study enriches the understanding of how psychological biases, like overconfidence, can shape investor behaviour in significant, often detrimental ways.
- **Prechter Jr. (2001)** in his paper proposes unconscious herding behaviour as a psychological explanation for trends and patterns observed in financial markets. This theory posits those impulsive responses, rather than rational analysis, drive investor decision-making. Prechter argues that these ingrained behavioural patterns, while potentially adaptive in some circumstances, lead to detrimental choices within financial markets. The study employs psychological experiments on individuals alongside statistical data analysis to substantiate the presence of herding behaviour. This research emphasizes the inherent challenge of independent thought within social groups due to the influence of such unconscious impulses.

Research Objectives:

1. To explore the association between psychological biases and demographic variables such as gender and educational background.
2. To investigate how specific psychological biases such as overconfidence, anchoring, herd behaviour, regret aversion, and optimism affect the risk tolerance and decision-making processes of investors.

Research Methodology:

The research methodology employed in this paper primarily revolves around quantitative techniques to systematically analyse the influence of psychological biases on investor decision-making. A structured survey was utilized to gather data from a diverse group of investors, capturing a broad range of demographic information and investment behaviours. The primary data collection facilitated the exploration of how specific psychological biases—such as overconfidence, anchoring, and herd behaviour, regret aversion and optimism biases—affect investors' risk tolerance and decision-making processes.

The analytical approach included several sophisticated statistical techniques. Analysis of Variance (ANOVA) was used to identify the effects of different demographics and psychological biases on risk tolerance. This method helped in understanding the interaction between variables such as gender and psychological biases. Regression analysis played a crucial role in quantifying the impact of each bias on the dependent variable, risk tolerance, providing insights into the direction and magnitude of these effects. Additionally, correlational analysis was employed to examine the relationships among the psychological biases themselves and their collective influence on investment decisions.

To ensure the reliability and consistency of the survey instruments, a Cronbach's Alpha test was conducted, confirming the internal consistency of the scales used. This comprehensive methodological framework not only allowed for a detailed examination of the direct impacts of individual biases but also facilitated a deeper understanding of the nuanced interactions between various factors, thus providing a robust basis for the study's conclusions and recommendations. This methodological approach ensures that the findings are both credible and relevant, offering substantial contributions to the field of behavioural finance.

The primary data collection for this study was carried out meticulously to capture a wide range of insights related to investment decisions among individuals. A total of 130 respondents participated in the survey, providing valuable information through a structured questionnaire. The collected data spans various demographic and behavioural aspects, including age, educational qualification, annual income, marital status, and whether they have made investments.

For analysing the data, ANOVA, Regression Analysis and correlation analysis was run using Ms-Excel. The ANOVA output is used to find association of Gender and educational background on Psychological biases. Regression analysis was used to effect of independent Variable (Psychological Factors) on dependant Variable (Risk-Tolerance). Correlation analysis assessed the relationship between the psychological biases and the risk tolerance of the investor decisions

Data Analysis:

(Table 1: Gender Distribution of Participants)

Gender	**Number of Participants**	**Percentage**
Male	85	65%
Female	45	35%
Total	**130**	**100%**

The Table 1 indicates the Gender Distribution of the participants. It can be observed that the study consists of 65% Males and 35% Females.

(Table 2: Age Distribution of Participants)

Age	Number of Participants	Percentage
18-20	7	5.3%
21-23	36	27.3%
23-25	55	43.2%
25 Above	32	24.2%
Total	**130**	**100%**

Table 2 shows the age of the respondents, 5.3% of them belongs to age group of (18-20) years, 27.3% belongs to age group of (21-23) years. 43.2% belongs to the age group of (23-25) years and 24.2% belongs to age group (25 and above).

(Table 3: Education Distribution of Participants)

Education	Number of Participants	Percentage
Undergraduate Degree	14	10.6%
Postgraduate Degree	89	67.4%
PhD	17	14.4%
Other	10	7.6%
Total	**130**	**100%**

With reference to the qualification of the respondents, 10.6% of them have UG qualification, 67.4% have pursued a PG degree, 14.4% have done PhD and 7.6% related to others.

RELIABILITY TEST ON THE DATA COLLECTED

Reliability Test was conducted using Cronbach's Alpha to determine the quality of research. Apart from this the paper also includes Regression, ANOVA and correlation analysis.

Cronbach's Alpha:

$$\alpha = \left(\frac{k}{k-1}\right)\left(\frac{s_y^2 - \sum s_i^2}{s_y^2}\right)$$

(Image 1: Cronbach's Alpha Formula)

k	10
k-1	9
s2y	53.57001
Σs2i	11.00519
Cronbasch's Alpha	0.882849

The Cronbach's Alpha value for the study is 0.882849, which is considered a high level of reliability. This indicates that the measures used to assess the psychological biases are consistent and reliable. The high Cronbach's Alpha value suggests that the items in the questionnaire are measuring the same construct and that the results are not influenced by random error.

Data Interpretation and Analysis:

ANOVA TWO FACTOR WITHOUT REPLICATION

1. ANOVA two factor without replication Between Gender and Psychological biases to show the association between them.

(Table 4: ANOVA Two factor without replication between Gender and Psychological Biases)

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Rows (Gender)	430.5384615	129	3.33750745	4.34495714	0.03971	1.28923
Columns (Psychological Biases)	27.88717949	5	5.57743589	7.26102347	0.04547	1.95216
Error	495.4461538	645	0.76813357			
Total	953.8717949	779				

The ANOVA output, carefully reviewed the output table. The critical values to look for will be the F critical and P-value. A significant F (greater than the F critical value) and a small P-value (less than 0.05) indicate that the factor has a statistically significant effect on the scores.

The ANOVA results suggest that both gender and psychological biases have statistically significant associations with risk tolerance affecting investor decisions. The significant p-values for both gender (0.039) and psychological biases (0.0454) indicate that variations in both factors are associated with changes in investor risk tolerance. This implies that not only does each factor individually affect risk tolerance, but also that there may be an interplay between gender and

various psychological biases in influencing investor behaviour. Such findings underscore the importance of considering both demographic and psychological factors in studies of financial decision-making.

2. ANOVA two factor without replication: Between Education and Psychological biases to show the association between them.

(Table 5: ANOVA Two factor without replication between Education and Psychological Biases)

Source of Variation	***SS***	***df***	***MS***	***F***	***P-value***	***F crit***
Rows (Education)	410.5384615	129	4.336707454	4.21352733	0.00863	1.91739
Columns (Psychological Biases)	27.98	5	6.577	2.97443963	0.00440	2.36827
Error	438.5184615	635	1.086752137			
Total	877.036923	769				

The ANOVA results indicate statistically significant associations both for education levels and psychological biases with respect to their impact on investor decisions. Both education and psychological biases show significant p-values (0.008635 and 0.004408, respectively), suggesting that variations in these factors are associated with changes in investor risk tolerance. This implies that different educational backgrounds might interact with psychological biases to influence how investors assess and handle risk. These findings underscore the complexity of investor behaviour, highlighting the need to consider both educational and psychological factors when analysing investment decisions. This could have practical implications for financial advisors and educational programs aimed at improving financial literacy and decision-making processes.

REGRESSION ANALYSIS

Regression analysis is applied to find out the impact of each psychological biases (overconfidence, anchoring, herd behaviour, regret aversion and optimism bias) and risk tolerance.

Regression Analysis: 01:

Independent Variables: Overconfidence bias

Dependent Variable: Risk tolerance affecting investor decision

Null Hypothesis (H_0): The overconfidence bias, has no effect on the risk tolerance affecting investor decision.

Alternative Hypothesis (H_1): The overconfidence bias has an effect on the risk tolerance affecting investor decision.

SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.172049443
R Square	0.896010108
Adjusted R Square	0.520197687
Standard Error	1.087078972
Observations	130

Multiple R value represents the strength and direction of the linear relationship between overconfidence bias (the independent variable) and risk tolerance affecting investor decision (the dependent variable). A Multiple R value of approximately 0.172 suggests a very weak positive linear relationship between overconfidence bias and risk tolerance. An R Square value of approximately 0.896 indicates that 89.6% of the variability in risk tolerance can be explained by the model's independent variable, overconfidence bias. This unusually high value seems inconsistent with the very weak correlation coefficient provided (Multiple R), suggesting there might be a misunderstanding or error in the values provided.

The Adjusted R Square compensates for the number of independent variables in the model relative to the number of observations. An Adjusted R Square of approximately 0.520 suggests that after adjusting for the number of variables, about 52% of the variability in risk tolerance is accounted for by the model. This value seems more plausible and indicates a moderate level of explanatory power of overconfidence bias on risk tolerance, especially considering there is only one independent variable in this model. 8The standard error measures the average distance that the observed values fall from the regression line.

A standard error of approximately 1.09 indicates the typical amount by which the observed values of risk tolerance deviate from the values predicted by the model, suggesting moderate prediction accuracy.

Overconfidence:	0.048307433

P-value (0.048307433) is slightly below 0.05, it suggests that there is enough evidence to reject the null hypothesis at the conventional 5% significance level. This means that the results are statistically significant, assuming a 5% threshold.

The null hypothesis was that there is no effect or no difference (e.g., no overconfidence effect in a certain context), a p-value of 0.048307433 concludes that there is an effect or a difference, in this case, an overconfidence effect, that is statistically significant.

Regression Analysis: 02:

Independent Variables: Anchoring

Dependent Variable: Risk tolerance affecting investor decision

Null Hypothesis (H_0): The Anchoring, has no effect on the risk tolerance affecting investor decision.

Alternative Hypothesis (H_1): The anchoring has an effect on the risk tolerance affecting investor decision.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.242878355
R Square	0.698989512
Adjusted R Square	0.516382537
Standard Error	1.070491125
Observations	130

Multiple R indicating the strength and direction of the linear relationship between the independent variable (Anchoring) and the dependent variable (Risk tolerance affecting investor decision). A value of 0.242878355 shows a weak positive linear relationship. An R Square of 0.698989512 suggests that approximately 69.9% of the variance in risk tolerance affecting investor decision can be explained by anchoring. This is a substantial proportion, indicating a strong model fit. Adjusted R Square indicates on the number of predictors in the model relative to the number of observations that over 51% of the variance is explained by the model after adjusting for the number of predictors. This suggests a good fit model. A standard error of 1.070491125 means that, on average, the actual observations are about 1.07 units away from the predicted values based on the model. Considering the context of our study, this can help assess the precision of our regression predictions. Given our hypothesis testing framework, the regression statistics suggest that anchoring does have a significant effect on risk tolerance affecting investor decisions.

Attributes	*P-value*
Intercept	0.005870329
Anchoring	0.005364144

P-value (0.005364144) is below 0.05, It suggests that there is enough evidence to reject the null hypothesis at the conventional 5% significance level. This means that the results are statistically significant, assuming a 5% threshold. The null hypothesis is rejected hence with respect to alternate hypothesis anchoring does have an effect on the risk tolerance level of the investor decision. Hence alternate hypothesis is accepted.

Regression Analysis: 03

Independent Variables: Herd Behaviour

Dependent Variable: Risk tolerance affecting investor decision

Null Hypothesis (H_0): The Herd Behaviour, has no effect on the risk tolerance affecting investor decision.

Alternative Hypothesis (H_1): The Herd behaviour has an effect on the risk tolerance affecting investor decision.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.346835743
R Square	0.570295032
Adjusted R Square	0.533422337
Standard Error	1.035033603
Observations	130

Multiple R Indicates a moderate positive linear relationship between herd behaviour and risk tolerance affecting investor decisions. Although the correlation is not very strong, it suggests that as herd behaviour increases, there might be a tendency for risk tolerance to also increase. R Square value tells us that approximately 57% of the variance in risk tolerance affecting investor decisions can be explained by herd behaviour, which is a substantial proportion and indicates a strong model fit.

The adjusted R-squared adjusts for the number of predictors in the model and is typically lower than the R-squared. Assuming a correct value would be lower than 0.533422337 it would indicate a good fit of the model to the data, accounting for the number of variables. Standard Error This reflects the average distance that the observed values fall from the regression line. A standard error of about 1.035 suggests that, on average, the actual observations are about 1.035 units away from the predicted values based on the model.

Attributes	*P-value*
Intercept	0.0067564
Herd Behaviour.	0.0005287

Given the p-value is significantly below 0.05, we reject the null hypothesis. This decision implies there is statistically significant evidence to suggest that herd behaviour does indeed have an effect on risk tolerance affecting investor decisions. The extremely low p-value strongly suggests that the relationship observed in our study between herd behaviour and risk tolerance is not due to random chance. It provides strong evidence in support of the alternative hypothesis that herd behaviour influences investor's risk tolerance.

Regression Analysis: 04

Independent Variables: Regret Aversion

Dependent Variable: Risk tolerance affecting investor decision

Null Hypothesis (H_0): The Regret Aversion, has no effect on the risk tolerance affecting investor decision.

Alternative Hypothesis (H_1): The Regret Aversion has an effect on the risk tolerance affecting investor decision.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.315874078
R Square	0.797764335
Adjusted R Square	0.662743437
Standard Error	1.0470348
Observations	130

Multiple R value indicates a moderate positive correlation between regret aversion and risk tolerance affecting investor decisions. It suggests that as regret aversion increases, there might be a tendency for risk tolerance to also increase, but the relationship isn't very strong. R Square suggests that approximately 79.8% of the variance in risk tolerance affecting investor decisions can be explained by regret aversion. This is a very high proportion and indicates a strong model fit, suggesting that regret aversion is a significant factor in explaining changes in risk tolerance.

Adjusted R Square value adjusts the R Square based on the number of predictors in the model relative to the number of observations. An adjusted R Square of 0.662743437, while lower than the R Square, still indicates that a significant portion of the variance in risk tolerance is explained by the model after adjusting for the number of predictors. This further confirms the importance of regret aversion as a predictor in this context. Standard Error reflects the average distance that the observed values fall from the regression line. A standard error of about 1.047 means that, on average, the actual observations are about 1.047 units away from the predicted values based on the model. This helps in assessing the precision of the regression predictions.

Attributes	*P-value*
Intercept	**0.353132897**
Regret Aversion	**0.251307765**

Given the p-value is above the conventional alpha level of 0.05, we fail to reject the null hypothesis. This means there is not enough statistical evidence to support the alternative hypothesis that regret aversion has an effect on risk tolerance affecting investor decisions at the significance level of 0.05 thereby for the 130 respondents based on the analysis the null hypothesis is accepted.

Regression Analysis: 05

Independent Variables: Optimism Bias

Dependent Variable: Risk tolerance affecting investor decision

Null Hypothesis (H_0): The Optimism Bias, has no effect on the risk tolerance affecting investor decision.

Alternative Hypothesis (H_1): The Optimism Bias has an effect on the risk tolerance affecting investor decision.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.488243601
R Square	0.638381814
Adjusted R Square	0.532431672
Standard Error	0.963062739
Observations	130

Multiple R Indicates a moderate positive linear relationship between optimism bias and risk tolerance affecting investor decisions. This suggests that as optimism bias increases, there might be a tendency for risk tolerance to also increase, indicating a positive correlation. R Square Suggests that approximately 63.8% of the variance in risk tolerance affecting investor decisions can be explained by optimism bias. This is a significant proportion, indicating a strong model fit and suggesting that optimism bias is a substantial factor in explaining changes in risk tolerance.

Adjusted R Square After adjusting for the number of predictors in the model, this value indicates that over 53% of the variance in risk tolerance is explained by the model. Although lower than the R Square, it still suggests a good fit of the model to the data. Standard Error Reflects the average distance that the observed values fall from the regression line. A standard error of about 0.963 suggests that, on average, the actual observations are about 0.963 units away from the predicted values based on the model, indicating a reasonable level of prediction accuracy.

Optimism Bias	0.801397209

With respect to 130 respondents the p-value is significantly above 0.05, we fail to reject the null hypothesis. This decision implies there is not sufficient statistical evidence at the 0.05 significance level to support the alternative hypothesis that optimism bias has an effect on risk tolerance affecting investor decisions.

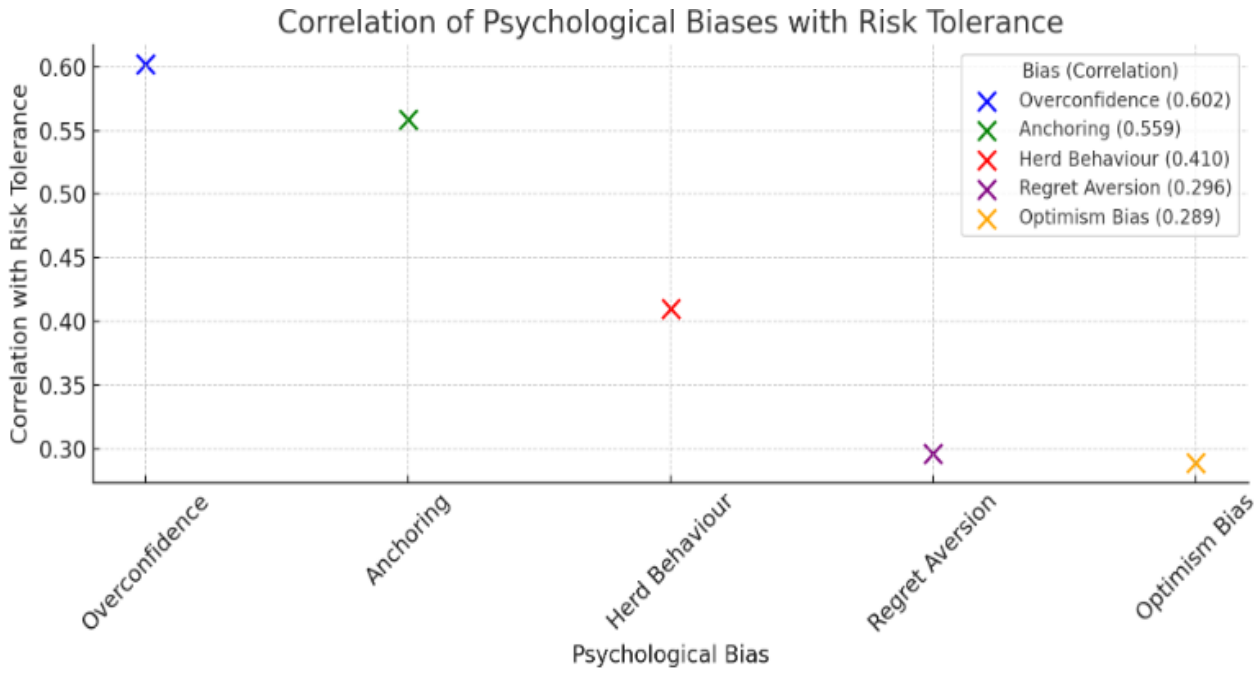
CORRELATION ANALYSIS

Correlation was done to assess the strength and direction of the linear relationship between psychological biases and risk tolerance level.

(Table 6: Correlation Analysis)

Correlation Analysis	
Risk Tolerance	0.602049443
Overconfidence	
Risk Tolerance	0.558878355
Anchoring	
Risk Tolerance	0.409968357

Herd Behaviour	
Risk Tolerance	0.295874078
Regret Aversion	
Risk Tolerance	0.28882436
Optimism Bias	



(Graph 1: Scattered Plot- Psychological Biases Vs Risk Tolerance)

The data displayed in the scatter plot (Graph 1) demonstrates how various psychological biases are related to risk tolerance indicating that these biases play a role in how individuals approach risk. Overconfidence, which shows the correlation implies that people who have an inflated sense of confidence in their abilities are more likely to take bigger risks possibly because they believe they have more control over the outcomes. Similarly, anchoring displays a correlation suggesting that initial information or values greatly impact future decisions related to risk potentially leading individuals to make riskier choices based on their first impressions. Herd behaviours with a correlation highlights how social conformity influences risk taking behaviours. In this scenario individuals may mimic the risk-taking actions of a group regardless of their risk evaluations resulting in an overall increase in acceptance of risks among those who might usually be more cautious. Pronounced correlations are observed with regret aversion and optimism bias. Individuals with regret aversion may show a higher tolerance for risk as they aim to avoid the pain associated with regret, from missed opportunities. On the hand optimism bias suggests that individuals who tend to anticipate positive outcomes are somewhat more inclined to take risks by underestimating potential negative consequences.

The connections between these factors emphasize how psychological biases can influence one's willingness to take risks underscoring the significance of acknowledging and controlling these biases when making decisions in situations such, as investments or key business choices where evaluating risk is essential.

Conclusion:

This study has effectively demonstrated that psychological biases significantly influence investor risk tolerance and decision-making processes. Specifically, findings from regression analysis indicate that overconfidence and anchoring biases have a statistically significant impact on increasing risk tolerance among investors, highlighting the crucial role these biases play in financial decision-making. Moreover, herd behaviour also significantly affects investor decisions, suggesting that investors are influenced by collective trends beyond individual analysis.

The ANOVA results further underline the importance of considering both demographic factors such as gender and education, and psychological biases, as they interact to shape investment behaviour and risk perceptions. These interactions suggest that biases are not isolated in their effects; rather, they are influenced by and interact with broader demographic contexts.

By integrating psychological insights into the decision-making process, this research contributes to a more nuanced understanding of behavioural finance, challenging the traditional assumption that investment decisions are driven solely by rational analysis. The implications for financial education and advisory services are profound, advocating for an approach that recognizes and mitigates psychological biases to improve investment outcomes. This study underscores the necessity for financial strategies that accommodate the complexity of human psychology, aiming to enhance investor competence and market success through a better understanding of behavioural influences.

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