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BEHAVIORAL BIASES AND INVESTMENT DECISIONS AMONG MALE AND FEMALE RETAIL INVESTORS IN INDIA

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ABSTRACT

PURPOSE – Investment decisions are pivotal in shaping individuals' financial well-being and long- term wealth accumulation. However, these decisions are not always made rationally and objectively. Instead, they are often influenced by various psychological factors, including cognitive biases and sociocultural factors, such as gender. Understanding the interplay between gender dynamics and cognitive biases in investment decision-making is crucial for devising effective strategies to enhance financial literacy, promote gender equality, and optimize investment outcomes. Hence, the purpose of this research is to confirm the variables influencing cognitive behavioral biases such as overconfidence bias, confirmation bias, representativeness bias and anchoring bias of male and female investors in their investment decisions.

RESEARCH DESIGN – In the current research study, a sample of 400 responses was gathered with the help of questionnaires and retail investors in India were the respondents for the study. Cronbach's Alpha as used to check the reliability of the data gathered and Confirmatory Factor Analysis (CFA) was used to confirm the variables for the study.

FINDINGS – This research paper delivers a second-order CFA model that displays adequate fit for both genders, with some variances in factor loadings, variances, and residuals. This proposes that while the overall structure is dependable, there are gender-specific gradations or shades.

ORIGINALITY/VALUE – The study of behavioral bias in decision-making is a dynamic field, with each research study yielding varying results. There are numerous scales available for measuring behavioral biases. The items and dimensions of behavioral biases are well-defined, leading the study to employ Confirmatory Factor Analysis (CFA) to validate the variables influencing behavioral biases in the context of investment decisions among both men and women. The findings of this research are intended to lay the groundwork for further large-scale research.

Keywords: Behavioural Finance, Overconfidence Bias, Representativeness Bias, Confirmation Bias, Anchoring Bias, Investment Decisions, Retail Investor, Male, Female, Gender

1. INTRODUCTION

The financial communal used to trust that clients made rational decisions based on information. However, behavioral finance has emerged as an important field, show-casing how the biases and eccentricities in our brains impact our financial choices, often leading us off track from rational choices.

One expressly captivating feature within this arena is understanding how men and women style their investing differently. It is vital to look for the interesting or exciting trends that may stay live, instead of making biased judgements which may cease to exist.

There exists various studies which highlights varying patterns in the behaviour of male and female investors with respect to investments which is all because of the mix of deeply ingrained human biases, psychology and cultural differences. From the very beginning of the existence of human race, it is seen and also believed that male members are primary bread earners for their family. This very nature of male group makes them to take more risk. On the other hand, female members were to take care of their family and the resources like money, grains, children and overall family with great care by being vigilant. This nature of female group makes them avoid risks. Various research studies have seen that these are general statements and may not be true in all cases.

The differences that have been discussed above are not just in the traditional roles of gender; but it is also on how the human brains work. When it comes to the concept of overconfidence nature in human beings, it is part of human nature irrespective of gender, but it is well noticeable in men group. This explains as to why men act quickly and take high risks whereas women often vigilantly take more careful approach and hence look for investment choices that are safe and diverse. Several studies also highlight and prove that men are more influenced by bubbles and turmoil in the market compared to female group who are less affected by the chaos in the market. Many research studies have found that women show preference towards their financial security instead of potential gains which is uncertain.

Behavioural finance is dynamic in nature and with every study varying tendencies are seen in the investment behaviour among females and males which may not be absolute truth. Each individual preferences, financial status, changing culture norms, family background and various other factors can dominate these patterns and challenge the traditional roles of gender. To overcome or mitigate the deeply ingrained behavioural biases in human beings, it is necessary to be aware of these twists and turns. Thereby one can develop a customised or tailored strategy while investing. To explore the financial market and investments with good confidence and understanding, it is important to be aware of complexities.

2. LITERATURE REVIEW

Research study has surveyed and emphasised that there exists a substantial influence of positive emotions while making investment decisions or choices but there is no mention of association among investment choices or decisions and the negative emotions (Sutejo et al., 2023). One of the research studies has investigated the impact of knowledge in investments, sexual category, and education on biases like overconfidence and self-attribution among investors in mutual funds (Mishra C Metilda, 2015). Outcome of the study highlights that the existence of higher overconfidence among males, with increase in knowledge in investments and education. Self attribution rises with education, but no significant gender or experience- related association. There exists a probable connection between gender and risk aversion, with female investors sloping towards a more cautious approach. It found a weak negative correlation between overconfidence and other biases, emphasising the existence of overconfidence helps in mitigating the influence of other biases (Shaikh et al., 2019). Omoruyi C James Ilaboya (2019) found that while some biases, like hindsight bias, significantly impact decisions, others do not. The study underscores the need for investor education to mitigate these biases and recommends seeking professional advice to make informed decisions. It has been found that female investors' investment decisions are highly influenced by some biases like overconfidence and herd behaviour (Singh C Jain, 2021). While making choices or taking decisions, cognitive biases and heuristics facilitate the understanding of heuristics and biases among investors particularly business students (Chira C Adams, 2008). Studies provide appreciated visions into the choice-making or decision-making routes among women entrepreneurs (Qamar C Lodhi, 2023).

Studies examine and highlight the gender-based differences and how investors are influenced by behavioural biases, and thereby challenges typical financial theories that based on the assumption that investors are rational in making decisions (Singha, 2015). Research studies emphasize the negative impacts or influence of behavioral biases like overconfidence and herd behavior and risk tolerance behavior on investment performance. (Nidhi, 2017). Also, few other studies highlights the considerable effect of psychological dynamics like overconfidence, herding, and optimism on individual investors, , and thereby challenges typical financial theories that based on the assumption that investors are rational in making decisions (Dungarwal, 2022).

Research results highlight the incidence of cognitive biases such as representativeness influencing the investment decisions (Dhakal, 2023). Research work exposes the considerable positive impact of investor behavioral biases like herding behavior and overconfidence bias on investment decisions among investors (Chhapraa, 2018). Additionally,

recent studies like (Patnaik, 2023) focus on the impact of cognitive biases, specifically during the COVID-19 pandemic, further enriching the understanding of how external factors can interact with biases to shape financial decisions. (Singh, 2023) exploration of cognitive biases such as mental accounting and anchoring further contribute to this evolving field, particularly in understanding their influence on risk perception and investment decisions, with implications for both genders.

3. PARTICIPANTS

400 participants successfully completed the study (28.3% females and 71.7% males; across the age groups varying between less than 29 years to more than 60 years). The participants were the retail individual investors in India. The tool used for collecting the data from the participants was Questionnaire. The study basically made use of primary data for the research.

1. EXPERIMENTAL METHOD

In the current research study, investment decisions are adopted as the dependent variable. The subjects related to investment decisions comprise 07 questions, rated applying the 5- Point Likert Scale varying between Strongly disagree to Strongly Agree.

For the current research study, dimensions of behavioral biases are taken as the independent. The subjects related to dimensions of Behavioral Biases include 12 statements, assessed employing the 5-Point Likert Scale ranging from Strongly disagree to Strongly Agree.

2. DATA ANALYSIS AND RESULTS

Second Order Model with Invariance

Chi-square experiment

Model	X^2	df	p
Baseline	1568.743	132	
Factor	222.354	100	< .001

Chi-square experiment

Model	X^2	df	p

Other fit determinants

Metric	Value
Comparative Fit Index (CFI)	0.915
*RMSEA	0.080
*RMSEA 90% CI lower bound	0.066
*RMSEA 90% CI upper bound	0.094
*RMSEA p-value	4.026×10^{-4}
**SRMR	0.070

* Root mean square error of approximation
** Standardized root mean square residual

The aimed two-factor configuration had a decent model fit: RMSEA = .080 (population error) which is an indication of close fit, SRMR = .070 (Size of residuals), CFI = .915 which indicates the relation among variables and is good. All the factor loadings in the study were statistically significant and were assessed using z-statistics (ps < .001), had a score of more than 0.55. Hence, it is evident that the relation among the variables in the model is strong and has close fit.

R-Squared

	R^2	
	Male	Female
OC1	0.583	0.752
OC2	0.564	0.688
OC3	0.417	0.536

AA1	0.165	0.263
AA2	0.472	0.804
AA3	0.466	0.511
CON1	0.367	0.413
CON2	0.464	0.431

R-Squared

	R^2	
	Male	**Female**
CON3	0.580	0.686
REP1	0.697	0.643
REP2	0.759	0.742
REP3	0.044	0.128
Over confidence	0.101	0.152
Anchoring	0.724	0.299
Confirmation	0.635	0.981
Representatives	0.494	0.689

Factor loadings

							G5% Range of Confidence	
Group	**Factor**	**Pointer**	**Approximate**	**Std. Fault**	**z-rate**	**p-value**	**Min.**	**Max.**
Male	Over confidence	OC1	1.000	0.000			1.000	1.000
		OC2	0.951	0.104	9.185	<.001	0.748	1.154
		OC3	0.912	0.105	8.711	<.001	0.707	1.117
	Anchoring	AA1	1.000	0.000			1.000	1.000
		AA2	1.580	0.303	5.215	<.001	0.986	2.174
		AA3	1.634	0.298	5.487	<.001	1.050	2.218
	Confirmation	CON1	1.000	0.000			1.000	1.000
		CON2	1.138	0.144	7.908	<.001	0.856	1.420
		CON3	1.262	0.149	8.448	<.001	0.969	1.555
	Representatives	REP1	1.000	0.000			1.000	1.000
		REP2	1.098	0.099	11.142	<.001	0.905	1.291
		REP3	0.253	0.078	3.241	0.001	0.100	0.407

Factor loadings

							G5% Range of Confidence	
Group	**Factor**	**Pointer**	**Approximate**	**Std. Fault**	**z-rate**	**p-value**	**Min.**	**Max.**
Female	Over confidence	OC1	1.000	0.000			1.000	1.000
		OC2	0.942	0.102	9.198	<.001	0.741	1.143
		OC3	0.905	0.114	7.920	<.001	0.681	1.129
	Anchoring	AA1	1.000	0.000			1.000	1.000

	AA2	1.812	0.394	4.603	<.001	1.041	2.584
	AA3	1.273	0.261	4.879	<.001	0.761	1.784
Confirmation	CON1	1.000	0.000			1.000	1.000
	CON2	1.003	0.195	5.146	<.001	0.621	1.385
	CON3	1.319	0.226	5.834	<.001	0.876	1.762
Representatives	REP1	1.000	0.000			1.000	1.000
	REP2	1.094	0.130	8.433	<.001	0.839	1.348
	REP3	0.501	0.145	3.444	<.001	0.216	0.786

Second-order factor loadings

Group	Factor	Pointer	Approximate	Std. Fault	z-rate	p-value	G5% Range of Confidence Min.	Max.
Male	Second Order	Over confidence	1.000	0.000			1.000	1.000
		Anchoring	1.996	0.620	3.221	0.001	0.781	3.211
		Confirmation	2.615	0.721	3.624	<.001	1.201	4.029
		Representatives	2.949	0.815	3.618	<.001	1.351	4.546
Female		Over confidence	1.000	0.000			1.000	1.000
		Anchoring	1.031	0.387	2.662	0.008	0.272	1.790
		Confirmation	2.307	0.726	3.176	0.001	0.883	3.730

Second-order factor loadings

Group	Factor	Pointer	Approximate	Std. Fault	z-rate	p-value	G5% Range of Confidence Min.	Max.
		Representatives	2.095	0.695	3.015	0.003	0.733	3.457

Factor loadings near to -1 or 1 tells that the factor strongly influences the variables. Loadings near to 0 represents that the factor doesn't have influence on the variable. Here in the above table of factor loadings, it can be observed that all the factors are close to 1 and hence it can be interpreted that the factors strongly influence the respective behavioral biases such as Overconfidence bias, Anchoring bias, Confirmation bias and Representativeness bias among men and women investor respondents in the study.

When investigated second-order factor loading as well, it can be observed that behavioural biases factors strongly influence these overall behavioral biases among both men and women investor respondents in the study

Factor variations

Group	Pointer	Approximate	Std. Fault	z-value	p-value	G5% Range of Confidence Min.	Max.
Male	Over confidence	0.434	0.074	5.849	<.001	0.289	0.580
	Anchoring	0.074	0.038	1.924	0.054	-0.001	0.149
	Confirmation	0.192	0.064	3.009	0.003	0.067	0.316
	Representatives	0.433	0.084	5.146	<.001	0.268	0.598
	Second-Order	0.049	0.025	1.955	0.051	-1.266×10^{-4}	0.097
Female	Over confidence	0.570	0.118	4.818	<.001	0.338	0.802

Anchoring	0.254	0.102	2.490	0.013	0.054	0.453
Confirmation	0.010	0.087	0.118	0.906	-0.161	0.182
Representatives	0.202	0.082	2.455	0.014	0.041	0.363
Second-Order	0.102	0.061	1.678	0.093	-0.017	0.221

Remaining variations

						G5% Range of Confidence	
Group	**Pointer**	**Approximate**	**Std. Fault**	**z-value**	**p-value**	**Min.**	**Max.**
Male	OC1	0.345	0.053	6.464	< 0.001	0.241	0.450

Remaining variations

						G5% Range of Confidence	
Group	**Pointer**	**Approximate**	**Std. Fault**	**z-value**	**p-value**	**Min.**	**Max.**
	OC2	.338	.050	6.785	<0.001	0.240	0.435
	OC3	.562	.062	9.049	< 0.001	0.440	0.684
	AA1	1.352	.125	10.787	<0.001	1.106	1.598
	AA2	.748	.098	7.634	<0.001	0.556	0.940
	AA3	0.820	0.109	7.531	<0.001	0.607	1.033
	CON1	0.905	0.094	9.675	< .001	0.722	1.088
	CON2	0.784	0.093	8.390	< .001	0.601	0.967
	CON3	0.604	0.091	6.619	< .001	0.425	0.783
	REP1	0.372	0.073	5.115	< .001	0.229	0.514
	REP2	.327	.083	3.921	< 0.001	0.164	0.491
	REP3	01.197	.103	11.582	< 0.001	0.994	1.399
Female	OC1	.221	.061	03.608	< 0.001	0.101	0.342
	OC2	.271	.059	04.552	< 0.001	0.154	0.387
	OC3	0.477	.082	05.850	< 0.001	0.317	0.637
	AA1	1.015	.152	6.674	< 0.001	0.717	1.313
	AA2	0.290	0.159	1.825	0.068	-0.021	0.601
	AA3	0.561	0.107	5.245	< .001	0.351	0.770
	CON1	0.785	0.132	5.945	< .001	0.526	1.043
	CON2	0.733	0.120	6.110	< .001	0.498	0.968
	CON3	0.439	0.121	3.627	< .001	0.202	0.676
	REP1	0.360	0.075	4.808	< .001	0.213	0.507
	REP2	0.269	0.078	3.470	< .001	0.117	0.422
	REP3	1.105	0.155	7.148	< .001	0.802	1.408

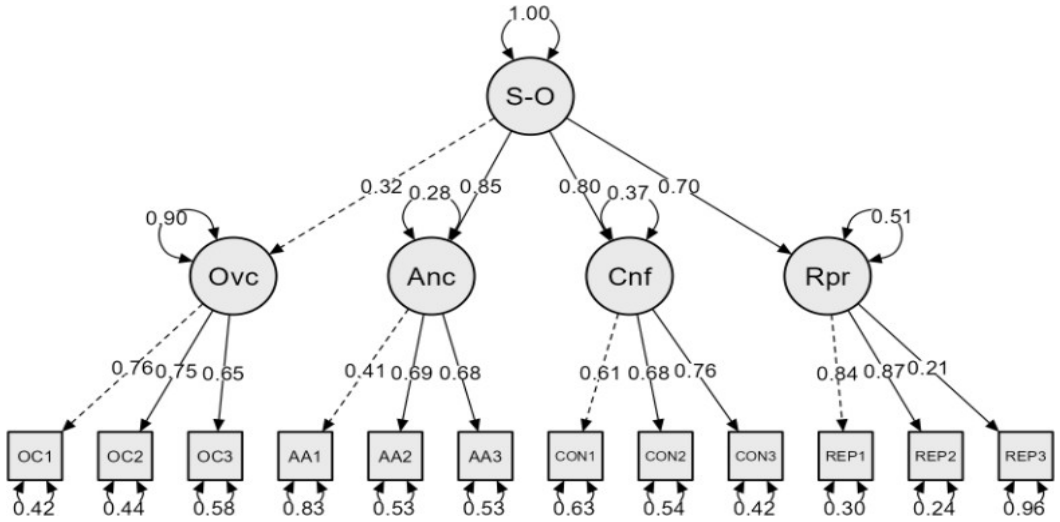
PLOTS

MODEL PLOTS

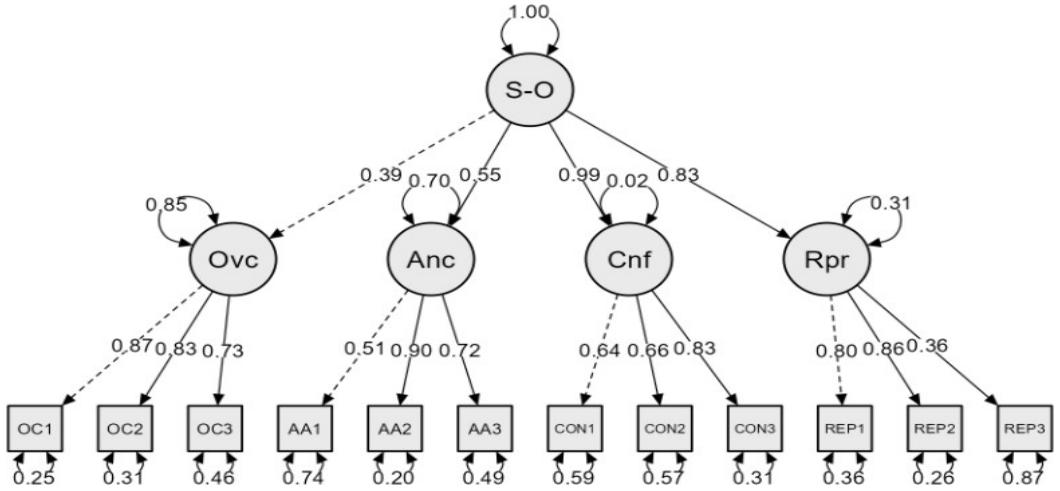
OC1, OC2 C OC3 are indicators of Overconfidence Bias Variable. Likewise, AA1, AA2 C AA3 are indicators for Anchoring Bias; CON1, CON2 C CON3 are indicators for Confirmation Bias and REP1, REP2 C REP3 are indicators for Representativeness Bias.

Overconfidence bias, Anchoring bias, Confirmation Bias and Representativeness Bias are the first-order factors and indicators of Behavioral bias which is the second-order factor among male and female individual investors in India

MALE INVESTORS



FEMALE INVESTORS



ANALYSIS S INFERENCE OF THE ABOVE DATA

MODEL FIT

- The overall model fit indices advocate an adequate fit for both genders, with CFI, RMSEA, and SRMR values representing that the model is sensibly good.

R-SQUARED (R^2)

- The R-squared values signify the proportion of variance described by each factor. Females commonly have higher R-squared values crosswise most indicators, telling that the factors describe more variance in the observed variables for females as related to males.

FACTOR LOADINGS

- Factor loadings are substantial for both genders, representing that the observed variables are good pointers of their respective first-order factors.
- Some differences in the size of factor loadings between genders advise that certain factors might be characterized somewhat differently by the indicators for males and females.

02ND-ORDER FACTOR LOADINGS

- 02nd-order factor loadings are important for both genders, signifying that the higher-order factor describes the first-order factors well.

- There are projecting differences in the magnitude of second-order loadings between genders, predominantly for Anchoring and Representatives, which are higher for males than females.

FACTOR AND RESIDUAL VARIANCES

- Factor variances differ between genders, with males display higher variances for Representatives and females viewing higher variances for Overconfidence.
- Residual variances are also dissimilar, with some indicators display higher residuals for one gender over the other, representing that other factors might be prompting these indicators differently crosswise genders.

CONCLUSION

The second-order CFA model validates adequate fit for both genders, with some variances in factor loadings, variances, and residuals signifying that while the inclusive structure is steady, there are gender-specific shades. These differences can deliver understandings into how diverse factors are alleged and how they manifest crosswise genders, which can advise targeted interferences or further research into gender-specific features of the constructs being restrained.

CONFLICT OF INTERESTS

None.

ACKNOWLEDGMENTS

None.

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