

# The Influence of Equity Investment Proportion on Investor Behavior

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**Abstract:** The behavioral makeup of the investor does influence the money allocated for equity investments. Using a questionnaire survey of 436 secondary equity investors residing in Chennai, the study measures the eight prominent behavioral biases influencing the equity investment decision on a Likert scale. The biases include: Mental Accounting, Anchoring, Gambler's fallacy, Availability, Loss Aversion, Regret Aversion, Representativeness and Overconfidence. Using the Analysis of Variance test, it was found that the investors divided on the basis of the proportion of monthly income invested in equity differed significantly for all the eight biases. Cross tabulation analysis was used to identify the characteristics of the investors who had a high equity investment proportion. Financial advisors and wealth managers could benefit from this study by identifying their target investors who are ready to yield a higher proportion of their income in equity investments.

**Index Terms - Mental Accounting, Anchoring, Gambler's fallacy, Availability, Loss Aversion, Regret Aversion, Representativeness, Overconfidence**

## I. INTRODUCTION

The average investor in the financial world has numerous investment options to choose from and invest his/her hard earned money. Though in the long term, the returns from equity investment are more than other secure investment options, most investors prefer the secure investment options like bank deposits, government bonds, etc. This equity premium puzzle is owing to the myopic loss aversion of having to witness the loss/gain of the equity investment on a daily basis.

The Indian equity market has recorded some important irrationalities like long term reversal, short term momentum, value premium anomaly, weekend effect, etc. These anomalies have been recorded by several researchers at various points in time and the classical financial theories have been unable to explain these anomalies. Behavioral finance which combines psychological principles to explain the irrationalities in the market had succeeded in explaining the anomalies. Hence Behavioral finance played an important role in explaining investor behavior.

Investors invest various proportions of their monthly income in equity investments. This study analyses the relationship between the proportion of equity investment and the investor behavior in terms of behavioral biases like Mental Accounting, Anchoring, Gambler's fallacy, Availability, Loss Aversion, Regret Aversion, Representativeness and Overconfidence. This relationship would help would financial advisors and wealth managers target the right audience of equity investors and advise them in accordance to the biases they are likely to exhibit based on the equity investment level.

## II. LITERATURE REVIEW

Davar and Gill (2009) surveyed 500 Indian households in order to analyse their decision making process with respect to investment choices. They documented that the investor's decision to invest in or abstain from a specific investment option depended on the satisfaction dimension with respect to the current investment as well as the opinion dimension with respect to the future investment. Demographics like income, occupation, education and age have a significant influence on the investor's decision making process. Mostly the affluent, educated and younger investors have preferred equity investments. Irrespective of the funds available, the affluent investors preferred equity shares for future investments.

Mehta and Sharma (2015) surveyed Indian investors to understand their investment pattern. The study found that equity investment was only the forth preferred investment avenue after bonds, gold/silver and real estate. Equity shares were found to be a more preferred investment avenue for the male investors compared to the female investors. The equity shares were the least preferred investment option for the female investors. The study also found that equity shares were mostly preferred by the middle age group investors in the age bracket of 36-55. Investors with a monthly income of up to Rs.10,000 have preferred the equity investment avenue more compared to the tax saving schemes. The study also recorded that the most opted investment strategy in equity was to sell the shares once the target was reached. The investors in the age bracket of 36-55 mostly adopted this investment strategy in equity investments. Most of the investors in the monthly income bracket of Rs.20,000-40,000 preferred not to sell the stocks and to rather hold them for a longer term. The main reason for investing in the equity market was to earn quicker and higher returns. Nearly 80% of the investors felt that the equity investments yielded the higher returns expected in shorter time frames. Sireesha and Laxmi (2013) analysed the influence of demographics on the various investment avenues among investors in the cities of Hyderabad and Secunderabad. They documented that the investors mostly save around 30% of their income for security reasons and invest for a period of 5 to 10 years. The main intention for investing was therefore the safety of money and not mere growth or liquidity. More than the analysts, the investors consult their friends for investment advice.

Bhattacharjee and Singh (2017) stressed the importance of awareness about equity investments through an extensive review of literature. They concluded that psychological, socio-economic and demographic factors determine the awareness about equity investments. Better awareness about equity investments would lead to better financial decisions and better risk management. Vohra and Kaur (2016) surveyed Indian women investors in order to analyse their awareness level in equity investments in order to prove empirically that it was the lack of awareness which led to non-participation in the equity market. All the factors namely: investment instrument, intermediaries, sources of investment information, regulatory and risk management measures undertaken by SEBI were proved to contribute significantly to determine the awareness among the women investors. The study also documented that the women non-investors were less aware of the equity market in comparison to the women equity investors. Hence it was proved that non-participation in the equity market was owing to the lack of awareness among the women investors. Singh and Bhattacharjee (2010) surveyed the employees of Oil India Limited (OIL) and documented that the age of the investor has a major influence on the past, present and future equity investment decisions. However, the gender of the investor influences only the present equity investment decisions. Male investors were more likely to invest in equity compared to the female investors. The investors in the age group of 30 to 40 were more likely to invest in equity compared to those above 50 years.

Kaur and Rajam (2012) identified the factors which affected the purchase decision of individual investors of equity shares in Mumbai. Out of the 36 variables surveyed it was found that market capitalization of the company followed by past performance of the company were the most influencing. And the least influencing variables were found to be conversation of views with professional colleagues and fluctuations in the indices of major markets. The educational qualification of the respondent was also found to be significant in influencing the equity investment decision. Bennet and Selvam (2013) analysed the investor participation in the Indian equity market using nine independent variables namely: Quality of Management, Recommendation of the Financial Community, Financial characteristics, Expected events surrounding the stock and book value, Price cut off rules, Past price performance and sector attractiveness, Price earnings and familiarity with products and services, Psychological factor and Who else is buying. The study recorded that investors' participation in the equity market was influenced significantly by only the financial characteristics which include the various financial ratios calculated using the information available in the annual reports.

Sivaramakrishnan et al. (2017) studied the influence of financial literacy on equity investment decisions in the Indian equity market using the theory of planned behavior. They documented that the investment intention predicted the actual equity investment behavior and both objective and subjective financial literacy influenced the investment intention. However, only the objective financial literacy influenced the actual equity investment behavior. The financial well-being had a positive influence on the actual equity investment behavior and negative influence on the investment intention. Xia et al. (2014) calculated a unique term, financial literacy overconfidence as the difference between the objective and subjective financial literacy scores of an investor. They documented that there is a positive correlation between stock market participation and financial literacy overconfidence after analysing the 2012 Chinese survey of consumer finance. Hence a high level of financial knowledge and confidence about that knowledge is needed in order to participate in the equity market.

McDonald and Sandada (2018) studied the determinants of stock market participation of the investors in the Zimbabwe equity market. They documented that the significant predictors of stock market participation were: transaction costs, cognitive skills, access to internet, awareness and perception. Significant differences were found between the male and female investors' views of the determinants of stock market participation with respect to the dimensions of awareness and access to internet. Similarly, significant differences were found among investors with different educational qualifications on their views of the determinants of stock market participation with respect to the dimensions of access to internet, trust and perceptions.

### III. OBJECTIVE OF THE STUDY

The main focus of this study is to determine if the proportion of the equity investment invested by the investor played an important role with respect to the behavioral biases namely, mental accounting, anchoring, gambler's fallacy, availability, loss aversion, regret aversion, representativeness and overconfidence exhibited by the secondary equity investors residing in Chennai.

### IV. SAMPLE AND METHODOLOGY

The population for the study are the secondary equity investors residing in Chennai. The samples selected for the study are the members of the Tamil Nadu Investors Association (TIA) and the clients of a popular financial services company, Integrated. The data was collected via the questionnaire survey method. TIA was selected as it was the only formal body which allowed access to collect data from its members. Integrated was selected as it was the only company which allowed access to collect data from its clients. The total valid questionnaires collected were 436 and hence the total sample size was 436.

### V. RESULTS AND DISCUSSION

The data was collected from the secondary equity investors residing in Chennai using the questionnaire survey method. The proportion of monthly savings invested in equity was measured in the study. The distribution of the proportion of equity investment is given in Table 5.1.

**Table 5.1. Distribution of the proportion of equity investment**

Dimension		Count	Percentage	Cumulative %	Mean	S.D
Proportion of direct investment in equity out of monthly savings	5% and less	185	42.4	42.4	8.91	6.91
	6% - 10%	127	29.1	71.6		
	11% - 15%	43	9.9	81.4		
	16% - 20%	22	5	86.5		
	More than 20%	59	13.5	100		

### 5.1 ANOVA results of Behavioral biases versus Equity proportion

The eight behavioral biases namely Mental Accounting, Anchoring, Gambler's fallacy, Availability, Loss Aversion, Regret Aversion, Representativeness and Overconfidence measured on a Likert scale were normalised and tested against the equity proportion using ANOVA. The test results shown in Table 5.2 show that the tests were significant for all the behavioral biases.

Except the overconfidence bias, for all the biases, the respondents who invest a higher percentage of their monthly income in equity have a lower mean that is the respondents who invest a higher percentage of their monthly income in equity are less likely to exhibit biases. The respondents who invest a higher percentage of their monthly income in equity were found to exhibit higher overconfidence bias.

**Table 5.2. ANOVA results of Normalised Biases vs Equity Proportion**

S.No	Behavioral Biases	F-value	Sig.
1	Mental Accounting	<b>7.910</b>	<b>0.000</b>
2	Anchoring	<b>5.079</b>	<b>0.001</b>
3	Gambler's Fallacy	<b>2.588</b>	<b>0.036</b>
4	Availability	<b>8.861</b>	<b>0.000</b>
5	Loss Aversion	<b>7.502</b>	<b>0.000</b>
6	Regret Aversion	<b>4.647</b>	<b>0.001</b>
7	Representativeness	<b>5.900</b>	<b>0.000</b>
8	Overconfidence	<b>6.748</b>	<b>0.000</b>

#### 5.1.1 Mental Accounting

The respondents in the equity proportion level of 11% to 15% had the highest mean of 16.4404 and the respondents in the high equity proportion level of more than 20% had the lowest mean of 13.2238 (based on the descriptives in Table 5.3).

**Table 5.3. Descriptives of Mental Accounting**

Mental Accounting	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
5% and less	185	15.8659	3.54181	.26040	15.3522	16.3797
6% - 10%	127	15.6713	3.39032	.30084	15.0759	16.2667
11% - 15%	43	<b>16.4404</b>	3.16915	.48329	15.4651	17.4157
16% - 20%	22	15.3229	3.02131	.64415	13.9833	16.6625
More than 20%	59	<b>13.2238</b>	3.49296	.45474	12.3135	14.1340
Total	436	15.4810	3.53972	.16952	15.1478	15.8141

#### 5.1.2 Anchoring

The respondents in the equity proportion level of 6% to 10% had the highest mean of 17.0683 and the respondents in the high equity proportion level of more than 20% had the lowest mean of 14.6427 (based on the descriptives in Table 5.4).

**Table 5.4. Descriptives of Anchoring**

Anchoring	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
5% and less	185	17.0070	3.64782	.26819	16.4779	17.5361
6% - 10%	127	<b>17.0683</b>	3.50651	.31115	16.4526	17.6841
11% - 15%	43	16.5400	3.54513	.54063	15.4490	17.6311
16% - 20%	22	16.7365	3.88310	.82788	15.0148	18.4582
More than 20%	59	<b>14.6427</b>	4.52440	.58903	13.4636	15.8217
Total	436	16.6452	3.80974	.18245	16.2866	17.0038

#### 5.1.3 Gambler's Fallacy

The respondents in the equity proportion level of 6% to 10% had the highest mean of 16.3811 and the respondents in the high equity proportion level of more than 20% had the lowest mean of 15.3447 (based on the descriptives in Table 5.5).

Table 5.5. Descriptives of Gambler's Fallacy

Gambler's Fallacy	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
5% and less	185	15.4931	2.81307	.20682	15.0851	15.9012
6% - 10%	127	<b>16.3811</b>	2.62812	.23321	15.9196	16.8426
11% - 15%	43	15.9112	2.60972	.39798	15.1081	16.7144
16% - 20%	22	16.2341	2.60933	.55631	15.0772	17.3910
More than 20%	59	<b>15.3447</b>	2.80947	.36576	14.6126	16.0769
Total	436	15.8103	2.75027	.13171	15.5514	16.0692

#### 5.1.4 Availability

The respondents in the equity proportion level of 6% to 10% had the highest mean of 15.7491 and the respondents in the high equity proportion level of 16% to 20% had the lowest mean of 13.7112 (based on the descriptives in Table 5.6).

Table 5.6. Descriptives of Availability

Availability	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
5% and less	185	15.6999	2.91651	.21443	15.2768	16.1229
6% - 10%	127	<b>15.7491</b>	2.57583	.22857	15.2968	16.2015
11% - 15%	43	13.8174	2.67323	.40766	12.9947	14.6401
16% - 20%	21	<b>13.7112</b>	3.06911	.66973	12.3141	15.1082
More than 20%	59	14.0994	3.11762	.40588	13.2869	14.9118
Total	435	15.2151	2.93478	.14071	14.9385	15.4916

#### 5.1.5 Loss Aversion

The respondents in the equity proportion level of 6% to 10% had the highest mean of 17.2857 and the respondents in the high equity proportion level of more than 20% had the lowest mean of 14.2664 (based on the descriptives in Table 5.7).

Table 5.7. Descriptives of Loss Aversion

Loss Aversion	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
5% and less	185	16.6598	3.37911	.24844	16.1696	17.1499
6% - 10%	127	<b>17.2857</b>	3.97294	.35254	16.5881	17.9834
11% - 15%	43	16.6284	3.37992	.51543	15.5882	17.6686
16% - 20%	22	15.6401	2.98818	.63708	14.3152	16.9650
More than 20%	59	<b>14.2664</b>	3.93861	.51276	13.2400	15.2928
Total	436	16.4637	3.72957	.17861	16.1126	16.8147

#### 5.1.6 Regret Aversion

The respondents in the equity proportion level of 6% to 10% had the highest mean of 17.7317 and the respondents in the high equity proportion level of more than 20% had the lowest mean of 15.5155 (based on the descriptives in Table 5.8).

Table 5.8. Descriptives of Regret Aversion

Regret Aversion	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
5% and less	185	16.5392	3.48672	.25635	16.0334	17.0449
6% - 10%	127	<b>17.7317</b>	3.63984	.32298	17.0925	18.3709
11% - 15%	43	17.3258	3.47741	.53030	16.2556	18.3960
16% - 20%	22	16.5663	3.91326	.83431	14.8312	18.3013
More than 20%	59	<b>15.5155</b>	3.38776	.44105	14.6326	16.3983
Total	436	16.8270	3.59895	.17236	16.4882	17.1657

### 5.1.7 Representativeness

The respondents in the equity proportion level of 6% to 10% had the highest mean of 16.6981 and the respondents in the high equity proportion level of more than 20% had the lowest mean of 13.8910 (based on the descriptives in Table 5.9).

Table 5.9. Descriptives of Representativeness

Representativeness	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
5% and less	185	16.0513	3.54325	.26050	15.5373	16.5653
6% - 10%	127	<b>16.6981</b>	3.86232	.34273	16.0198	17.3763
11% - 15%	43	15.9028	4.03081	.61469	14.6623	17.1433
16% - 20%	22	15.8105	3.93918	.83984	14.0639	17.5570
More than 20%	59	<b>13.8910</b>	3.48757	.45404	12.9821	14.7999
Total	436	15.9206	3.78339	.18119	15.5644	16.2767

### 5.1.8 Overconfidence

The respondents in the equity proportion level of 5% and less had the lowest mean of 15.9914 and the respondents in the high equity proportion level of more than 20% had the highest mean of 18.1177 (based on the descriptives in Table 5.10).

Table 5.10. Descriptives of Overconfidence

Overconfidence	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
5% and less	185	<b>15.9914</b>	3.53990	.26026	15.4780	16.5049
6% - 10%	127	18.0305	3.93025	.34875	17.3403	18.7207
11% - 15%	43	16.8610	4.10315	.62573	15.5982	18.1237
16% - 20%	22	16.6768	4.15531	.88592	14.8344	18.5192
More than 20%	59	<b>18.1177</b>	4.28104	.55734	17.0021	19.2334
Total	436	16.9935	3.94926	.18914	16.6217	17.3652

## 5.2 Cross tabulation results of the Equity proportion level

Based on the proportion of monthly income invested in equity, the equity proportion was divided into three levels. When the proportion of equity invested was 5% and less, it was classified as the low equity proportion level, when the proportion of equity invested was 6% - 10%, it was classified as the average equity proportion level and when the proportion of equity invested was above 10% it was classified as the high equity proportion level. The frequency distribution of the respondents in the various equity proportion levels are given below in Table 5.11.

Table 5.11. Frequency Distribution of the different equity proportion levels

Equity proportion levels	Frequency	Percent	Valid Percent	Cumulative Percent
Low Equity Proportion	185	42.4	42.4	42.4
Average Equity Proportion	127	29.1	29.1	71.6
High Equity Proportion	124	28.4	28.4	100.0
Total	436	100.0	100.0	

Cross tabulation between Equity proportion level and Gender shown in Table 5.12 showed that the male respondents have the highest equity proportion level with nearly 87.09% of the investors with high equity investment levels were male.

Table 5.12. Cross tabulation of Equity Proportion level vs Gender

Cross tabulation Equity Proportion levels * gender of the respondents		Gender of the respondent		Total
		Male	Female	
Proportion of monthly savings invested in equity	Low Equity Proportion	123	62	185
	Average Equity Proportion	91	36	127
	High Equity Proportion	108	16	124
Total		322	114	436

Cross tabulation between Equity proportion level and Age shown in Table 5.13 showed that the middle aged respondents have the highest equity proportion level with nearly 39.51% of the investors with high equity investment levels were middle aged.

Table 5.13. Cross tabulation of Equity Proportion level vs Age

Cross tabulation Equity Proportion levels * age of the respondents		Age Categories			Total
		Young Investors	Middle Aged Investors	Senior Investors	
Proportion of savings invested in equity	Low Equity Proportion	90	45	50	185
	Average Equity Proportion	44	43	40	127
	High Equity Proportion	34	49	41	124
Total		168	137	131	436

Cross tabulation between Equity proportion level and Annual Income shown in Table 5.14 showed that the high income respondents have the highest equity proportion level with nearly 44.35% of the investors with high equity investment levels were in the high income category.

Table 5.14. Cross tabulation of Equity Proportion level vs Annual Income

Cross tabulation Equity Proportion levels * annual income of the respondents		Annual Income			Total
		Low Income Group	Middle Income Group	High Income Group	
Proportion of savings invested in equity	Low Equity Proportion	106	54	25	185
	Average Equity Proportion	30	63	34	127
	High Equity Proportion	19	50	55	124
Total		155	167	114	436

### 5.3 Characteristics of the high equity investment level investors

The respondents with high equity investment level were analyzed in depth in order to understand their characteristics. Table 5.15 showed the mean and standard deviation of the behavioral biases of the respondents with high equity investment level. The biases are arranged in descending order of their mean values. The high equity investment level investors were more likely to exhibit overconfidence bias the most, followed by regret aversion, gambler's fallacy, anchoring, loss aversion, representativeness, mental accounting and availability.

**Table 5.15. Means of the biases of the high equity proportion level investors (in descending order)**

Descriptive Statistics	Mean	Std. Deviation
Overconfidence	17.4263	4.21669
Regret Aversion	16.3297	3.58195
Gambler's Fallacy	15.6990	2.70872
Anchoring	15.6721	4.18244
Loss Aversion	15.3292	3.72685
Representativeness	14.9292	3.86263
Mental Accounting	14.7116	3.59371
Availability	13.9345	2.94137

## VI. MANAGERIAL IMPLICATIONS

Wealth managers and financial advisors are vested with the most challenging task of guiding investors in making the right investment choices. This study would help them identify the right target of investors who invest a huge proportion of their monthly income in equity investments and further advice them in accordance to the behavioral biases they are likely to exhibit. Investors with different equity investment levels are prone to various degrees of biases hence a detailed guidance is possible via the findings of this study.

## VII. CONCLUSION

This study has recorded some important findings in the equity market with respect to the relationship between investor behavior and the proportion of equity investment. The ANOVA tests which tested this relationship yielded very significant results. It was found that except the overconfidence bias, for all the biases, the respondents who invested a higher percentage of their monthly income in equity had a lower mean that is, the respondents who invested a higher percentage of their monthly income in equity were less likely to exhibit biases. The respondents who invested a higher percentage of their monthly income in equity were found to exhibit higher overconfidence bias. Cross tabulation results found that the highest equity investments were done by the male investors, the middle aged investors and the high income investors. The investors who made the highest equity investments were more likely to exhibit overconfidence bias the most, followed by regret aversion, gambler's fallacy, anchoring, loss aversion, representativeness, mental accounting and availability biases. The wealth managers and financial advisors could benefit from this study by identifying their correct target investors and advise them in accordance with the biases they are likely to exhibit depending on their investment level.

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