

Impact of Behavioural Factors on Investment Decisions Making

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Abstract: In today's dynamically evolving world, which is driven by the fast-paced economies of the leading countries, every individual is investing with an aim for wealth maximization. This phenomenon has in turn driven the growth rate of the stock markets and has led to formation of a fertile ground for varied researchers, in an attempt to analyse and understand investor decisions. This study aims at identifying the various factors that help estimate the investor sentiments. It attempts to understand the significance of demographic factors of population such as gender, age, education, occupation, income, savings and family size over the several elements of investment decisions like priorities to characteristics of investments, period of investments, reach of information source, frequency of investments and analytical abilities. To achieve the said objective, survey was conducted to understand the behavioural aspects of an individual when investing and in turn develop prediction models that can help the companies in this sector predict what type of investor their customer is and their aggression level. This research gains significance as the consumer demands are increasing exponentially and in order to customize their offering for customers the companies need to analyse and segment them. Based on the said segmentation, companies can plan, develop and ensure that the customer requirements are adhered with. This study aims to achieve the said goal.

Keywords: Behavioural Finance, Individual investors, Financial Ratios, Investment Decision Making, Investor Behaviour

JEL Classification: G02, G10, G11

1. Introduction

Stock market in India plays a vital role in the growth of the industry and the commerce of the country that affects the overall economy. Their underlying impact is the reason why not only government and industry, but also central bank is vigilant about their performance. Stock market have a direct impact, since it provides a platform for public companies to raise funds for their expansion or new venture, which aids in development of the economy.

Over the past decade, with advent of digitalization and increasing efficient use of resources for decreasing the unemployment rate, the GDP rate of India has almost tripled. This growth is a sign that the investment which has been laggard, may be resurgent. The numbers indicate that the economy had shaken off the effects of demonetisation and come to grips with the goods and services tax (GST).

This growth in the size of economy has been complimented by the 8-fold increase in the market capitalization by the Indian companies. However, this growth is not consistent with the equity markets and their turnover. Presently there are 21 stock exchanges in India including Bombay Stock Exchange (BSE) and National Stock Exchange (NSE).

As per the latest statistics, almost 75%-80% of the NSE's turnover in India continues to come from the top seven cities of Mumbai, Delhi, Kolkata, Ahmedabad, Hyderabad, Bangalore and Kochi. In fact, the financial capital of India-Mumbai accounts for 55.4% of the total NSE turnover, beating Delhi, the second largest turnover roller with 11% market share, by huge margin. The same can be graphically represented as follows:

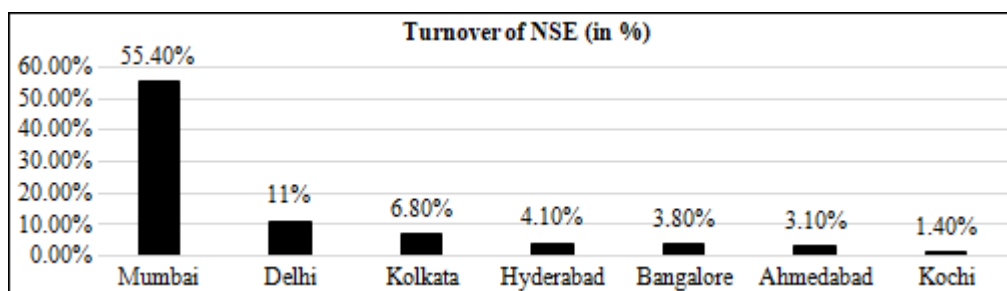


Figure 1: Graphical Representation of NSE turnover
Source: NSE

Considering the dynamic nature of stocks, study of behavioural finance becomes a pivotal aspect in its research.

The various factors that drive the behavioural aspect of finance can be broadly classified as follows:

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- Demographic Factors: Age, income, education, gender, etc.
- Psychological Factors: Cognitive dissonance, overconfidence, etc.
- Macroeconomic Factors: Inflation, money supply, foreign exchange rate, etc.
- Analytical Factors: Information about the company, investment experience and knowledge, available selection avenues, etc.

This study is essential as investor needs know certain factors such as the types of return, risk related aspects, inflation, cash-reserve ratio (CSR), repo-rates and tax-benefits. In spite of theoretical knowledge, lack of awareness of practical aspects that govern the dynamics of a stock markets and its varied instruments which has an inherent impact on one's decision-making.

2. Literature Review

Economic Utility theory states that the investment decisions on an individual is a trade-off between immediate consumption and deferred consumption. Every investor, before investing weighs the benefits of consuming today against the gains obtained in future by investing the unconsumed amount. The investors in India can be broadly classified into two main groups, one who have exposure to various investment avenues and the others who don't have any whereabouts of investments.

Stock market is a place where an organization or an individual can trade stocks. The buyers and sellers are termed as market participants. Market participants include individual retail investors, institutional investors such as mutual funds, banks and insurance companies and publicly traded corporations trading in their own shares. This environment makes stock more liquid and thus more attractive to many investors.

Barber and Odean (2001b) have studied the performance of investors who shifted from phone-based trading to internet trading. Their study concluded that performance of investors who shifted to internet trading had decreased due to the augmentation of overconfidence by illusion of knowledge, in sense they became more confident when they had access to more knowledge.

In relation to the above findings Dennis A. V. Dittrich, Werner Güth & Boris Maciejovsky (2005) in their study have investigated overconfidence in an experimentally induced risk aversion. Two experiments were conducted, first one investigates the investors investment behavior involving only one risky asset, whereas the second one involves two different risky assets. From the results it was concluded that overconfidence is one of the major factors affecting investor decisions. Apart from this they also concluded that (i) overconfidence leads to less accurate decisions, (ii) Overconfidence increases with task complexity and (iii) people are less overconfident when perceived uncertainty is high.

Malmendier and Nagel (2009) in their study concluded that personal macroeconomic experiences seem to have a great

impact on personal decisions and on the risk appetite of individual investors. On in-depth analysis they found that investors who have experienced high inflation invest conservatively than the others for opt for an aggressive approach. Kaur and Vohra (2012) based on their thorough analysis found that the investment strategies adopted by various categories of investors depended on their level of knowledge in addition to other macro-economic factors and very heavily influenced by the variety of benefits offered.

In furtherance of research conducted by Agarwal and Khushbu(2012)which established a theoretical framework for the behavioural biases that affect the investment decision; underlying principle being that the behavioural biases cannot be viewed in isolation. The said acts as a catalyst in development of a holistic framework where the strength of the behavioural biases depends on the external environment. Neha Agarwal et al.(2016)highlights attributes that help quantify the behavioural aspects governing an investment decision. The major ones being loss aversion and illusion of control. They established a positive relationship between the said biases and attitude of an investor based on the data collected from 100 investors via the means of electronically administered questionnaire.

Phan Zhou(2012) piloted a study in Vietnam stock market to ascertain psychological factors that influence the investment decisions of investor. This was a qualitative research in the field of behavioural finance for which data was collected via means of in-depth interview with about 20 investors. The study's findings were valuable in providing supporting evidences for the existence of four psychological factors of individual investors in Vietnam stock market which governed an individuals' behaviour viz.: Overconfidence, Excessive Optimism, Attitude towards Risk and Herd Behaviour.

Riffin and Ahmad (2012)conducted in their study developed a conceptual framework in relation to factors determining investment strategy of investors. The level of risk an investor was willing to take lead to their categorisation based on investment strategy; to be aggressive, moderate or conservative. Through this research, a conceptual framework in regard to how investors develop their investment strategy based on investors' specific factors and socioeconomic factors. The findings observed that, higher income and greater investment experiences lead to higher risk tolerance and investor will tend to choose risky investments to match with their high level of risk tolerance.

Dr. Murlidhar Panga, Anjali Malpani and Ajay Malpani (2016) in their study provided evidence for ascertaining the behavioural biases that influence investors during investment decision making such as anchoring, overconfidence, herd behaviour, over and under reaction and loss aversions. They analysed the primary data using PCA technique collected from 244 respondents through the means of questionnaire. They concluded by offering insights for developing a framework for evaluating investment strategies for the investors based on their behavioural aspects.

Rishabh Dev(2016) carried out in-depth analysis of the behaviour of investors of Uttarakhand state, with respect to

their demographic diversities. This study aimed to understand the intricacies of aggression in investment in the area of behavioural finance by studying different clusters of investors. The findings of the study were that, although in Uttarakhand the women were relatively more involved in earning for their family, the males were more aggressive than female in their investment; and business & retired categories respondents were comparatively more aggressive investor than service categories respondents.

Martin Ronald et al.(2017) in their research paper proposed a study to understand the behaviour analysis of investor's attitude in an attempt to know the profile and characteristics of the investors. This study considered a sample size was of 100 and both demographics, as well as psychographic factors, were considered. The study concluded that investors are more aware about various investments avenues and the risk associated with them. Investors are more conservative in nature and prefer to invest in those avenues where risk is less like bank deposits, small savings, post office savings, etc. The study also found out that life insurance is the most preferred investment avenues because of the offered benefits such as life protection, tax advantage and the feature of making provision for future.

Sarkar et al. (2018) conducted a study for analysis of investment behaviour of individual investors in stock market to observe the impact of demographic factors, awareness and perceived risk attitude on investment behaviour. The primary data for the study was collected from 400 randomly selected individual investors from various districts of West Bengal using a structured questionnaire on five point Likert scale. The study concluded that perceived risk attitude is mainly guided by affect rather than cognition also, the awareness levels of individual investors are on moderate level and; financial awareness is more than social learning. The analysis indicates that demographic factors, awareness and perceived risk attitude significantly influence investment behaviour of individual investors in stock market.

Kanan Budhiraja et al(2018)investigated the challenges behavioural finance pose to the traditional finance theories and assimilated the multiple biases that impact individual investment decisions including the heuristic biases such as anchoring, representativeness, gamblers fallacy, regret aversion, framing and disposition effect as elaborated under prospect theory. The paper illustrated steps that can be undertaken to rationalize decisions taken by investors and the fervent need to carefully mine data and consider external factors before undertaking investments.

Sunaina Kanojia et al.(2018) has done this study to fill the gap by determining the factors that appear to influence the individual investment decisions, and included the factors investigated by previous studies as conducted by Sindhu.K.P. et al.(2014) and Suzaida Bakar et al.(2015) derived from prevailing behavioural finance theories and introduced additional factors that have been found to influence the stockholders' investment decisions in emerging markets. The factors that were considered in this research were overconfidence, disposition effect, representativeness bias, cognitive dissonance, herd behaviour, culture, and mood. The study follows the survey

research methodology to examine the impact of behavioural factors on investment performance of retail investors. The analysis of the study revealed that respondents gets maximum influenced by representative bias, followed by overconfidence, cognitive dissonance and disposition effect. However, there is no impact of herd behaviour on the respondents.

In furtherance of above, Rupinder Kaur Gill and Rubeena Bajwa (2018) carried out an extensive study for assessing the correlation between behavioural biases and investment decision-making. It classified the behavioural biases in three distinct categories – Self-deception limited by one's learning, Heuristic simplification bounded by one's ability to process investment related decisions and social interaction. Their findings reflected the inherent impact of the behavioural biases and the fervent need to cognizance to aid in well-informed investment-related decisions.

Waseem-UI-Hameed, Saeed Ahmad Sabir, Shazma Razzaq and Dr. Asad Afzaal Humanyon (2018) in their study have revealed that psychological factors have important contribution towards an investor's decision making. Smart PLS 3 algorithm was used to analyze the data with a sample size of 200 responses. The research concluded with overconfidence as the major reason for decrease in the accuracy of investor's decision-making and on the contrary religiosity being identified as one of the important factors increasing the accuracy of investor decisions.

Similar results have been found by Babli Dhiman and Saloni Raheja (2018) in their study where they have tried to find the relation of risk tolerance of investors with personality traits and Emotional Intelligence (EI). The data was collected from 500 investors in Punjab by using structured questionnaire. Multiple Regression test was performed using SPSS to test the relationship. The study concluded that there is a direct relationship between personality traits of investors, EI and investment decision of the investor.

Saeed Ahmad Sabir, Hisham Bin Mohammad and Hanita Binita Kadir Shahar (2019) in their study have investigated the influence of overconfidence and past investment experience on the herding behavior of individual investors. The data was collected from 352 individual investors through the means of questionnaire. Their findings indicate that (i) different levels of financial literacy correspond to different levels of intensity of herding behavior among individual investors, (ii) past investments and overconfidence have a positive relationship and herding behavior.

Mukesh Kumar Jakhar and Dr. R.K Motwani (2019) developed a conceptual model comprising of investment determinants for analysing investment decision-making. They concluded that objectives, ability to plan investments and execute procedures, access to meaningful information, and level of technical knowhow were the major factors in addition to economic factors that govern the economy of a country. The paper also aided in drawing parallels between institutional and non-institutional investors to reflect the extent to which correlation between investment objective

and asset familiarity exert an impact on investor behaviour during their decision-making.

Zandri Dickason and Sune Ferreira (2018) establish which behavioural finance biases are associated with a certain level of risk tolerance and investor personality through this research. Furthermore, the study aimed towards indicating how these behavioural finance biases can influence investment decisions. A questionnaire was used to execute the quantitative approach consisting of three sections, namely, single risk tolerance question known as Survey of Consumer Finance (SCF), behavioural finance biases and domain specific risk-taking scale (Dopsert) which measured investor personality. The sample size of 1171 was taken. In order to have ensured internal consistency reliability a Cronbach's test was also executed. A null hypothesis was stated in order to determine the statistical difference between behavioural finance biases and Dospert/constructs. The statistical differences were determined by undertaking an analysis of variance test (ANOVA) set at a confidence level of 95%. Results indicated that investors with a low-risk tolerance level and a conservative investor personality are subject towards loss aversion and mental accounting biases.

Quan N. Tran (2017) investigate behavioral patterns expressed by investors in the Thailand stock market. The data for this research was collated from 8 individual investors through semi-structured and in-depth interview. There are four behavioral factors of individual investors in Thailand Stock Exchange which were considered for the research: Overconfidence, Excessive Optimism, Psychology of risk, and Herding Behavior. They have a profound impact on making investment decisions of investors. Research result can also give some useful information to financial advisors.

Adeel Rahim, Mumtaz Hussain Shah and Alamzeb Aamir (2019) analysed the impact of Conservatism bias effect on investment decisions of Pakistani Stock exchange (PSX) investors. This study has tried to address investor biases by taking Conservatism bias along with its sub variables as an independent variable and investment decision as dependent variable and determine the impact of both variables on investor decisions of Pakistani stock investor. The study is quantitative in nature and for this Primary data was collected through Questionnaire survey technique through stock exchanges working under PSX. The sample size is of 462. Descriptive statistics, rank correlation and its analysis, association method and applied logistic regression model have been used for analysis. The findings of the study suggest that Conservatism bias has positive impacts on the investment decisions of PSX individual investors.

Dr.S.Jayaraj (2013) aims to identify the psychological biases which may influence individual investment behavior in Indian stock market. Questionnaire technique was used to collect data in Tamil Nadu. Cronbach Alpha test was used to measure internal consistency and reliability of the questionnaire. The data were collected from a sample of 300 individual. The principal component analysis technique was used for multivariate analysis of the data. Statistical tests such as KMO test and Bartlett's Test of Sphericity were used to test the suitability of the techniques. The results of the principal component analysis reveal the six underlying psychological axes that appear driving the individual

investor behavior: conservatism, diligent and discreet, remorse abhorrence, cognition, prudence and precaution, under confidence.

3. Research Methodology

Research Problem

In the traditional financial models, investors are considered to be rational wealth maximisers, who follow basic financial rules and base their investment strategies considering only the risk return as the factor that influences investment decisions. Investors think as they are rational and logical in making investment decisions. But when it actually comes to investing, their thought patterns, emotional inclinations, and psychological biases colour how they perceive the world and how they make investment decisions.

This study is sought to fill the gap by determining the factors that influence the individual investment decisions which includes demographic factors, psychological factors, macroeconomic factors and analytical factors which have been studied by previous researches; and also ascertain aggressiveness of an investor.

Objectives of the Research

The main aim of the study is to identify the factors that influence an investor's decision-making and access their aggression level during the said investment decision-making. The objectives can be broadly described as follows:

- 1) To study the impact of demographic profiles on one's investment decisions and Aggression level.
- 2) To find out whether risk propensity of stocks influences investor's decision-making.
- 3) To study the correlation between economic and performance attribute factors that drive the market and aggression level of an investor.
- 4) To study the pattern of investment decisions taken and analyse behaviour of the investors.

Description of Research Design

The aim of our research is to analyse and identify the factors affecting the aggression level of an investor when investing. On thorough analysis of varied literature survey, we found several factors that in turn drive the sentiments of an investor. In our study, the dependent variable is aggression level of an investor. To predict and determine the same, varied independent factors have been considered viz:

- **Demographic factors:** These factors help provide an insight about our respondents and aid in better understanding of their behaviour when investing. The demographic factors considered in our study are Age, Gender, Education Level, Occupation, Annual Income and Amount invested annually. In addition to above, the type of investment preferred and the type of investors they are, with respect to risk propensity, behavioural biases are also considered.
- **Investors' Objective:** This factor helps in determining the objective, an investor has while investing. The said can be preference for viz.: Short term capital gains, Long- term capital gains, Dividend income, Diversification and Minimizing the risk for future.
- **Source of Information:** This is another independent factor, considered since awareness of stocks and their

inherent dynamics impacts one's investment decisions. The different sources of information considered are: Family/Relative/Co-worker Opinion, Financial advisor, Broker, Stakeholder Opinion and Financial Statements and reports published.

- **Economic and Market Factors:** It is an independent factor, that helps understand the market and economic environ. It builds up investors' decision by providing requisite information that plays a pivotal role in driving the financial market dynamics. They are as follows: GDP, Interest Rates, Inflation Rate and Govt. stability
- **Company Factors:** These factors are qualitative measure of the company one invests in. They act as catalyst in driving the investment decisions. Some of the company attributes are Size of the firm, Services/ Products offered by them, Firms' reputation and Firms' Local and international operations.

- **Performance attributes:** These constitute as independent factors that enable one's decision making and aids in evaluation of several parameters that are instrumental in determining the gains associated. The performance of a stock is evaluated using following: Stock price per share, Volatility (in terms of volume of shares issued), Earning per share (EPS), Dividend per share (DPS), Dividend yield ratio (DYR), Price per earnings ratio (P/E), Current ratio (CR), Debt-equity ratio (DER) and Return on equity (ROE).

While all of above, constitute as independent factors, that aid in prediction of ones' investment decisions, Information asymmetry acts as a mediating variable. Its existence influences investors' decision making. The above theoretical framework can be schematically represented as follows:

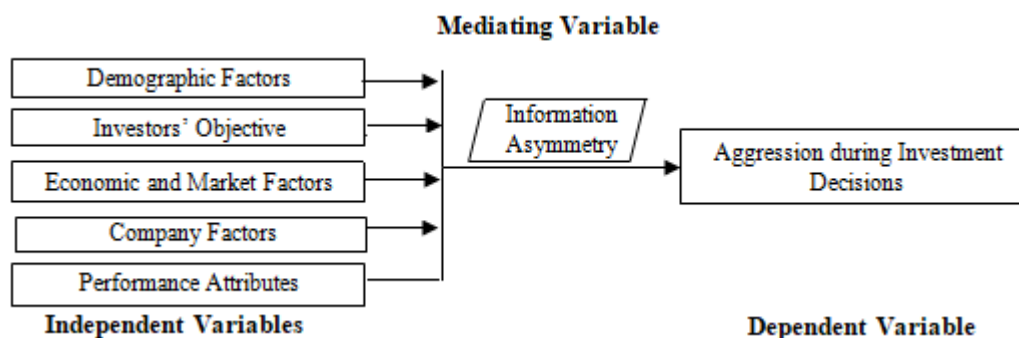


Figure 2: Schematic of Research Design

Hypothesis

A hypothesis is a proposed explanation regarding certain behaviours, facts or events that occur or will occur. It is intended towards explaining the expectations of the results of the study. The hypothesis for the current study are:

H_0 = There is significant relationship between the parameter and aggression level of investor during investment decision.

H_a = There is no significant relationship between the parameter and aggression level of investor during investment decision.

Sources of Data and Data Collection Methods

In our study, in order to study the significant relationship between aggression level and the influencing factors, primary data was needed.

The said primary data was collected via survey (refer appendix) from a sample size of 121 respondents belonging to Udaipur and Mumbai. All the information and data for this research was accumulated from essential sources by means of self-completion questionnaire. The questionnaire drafted comprises of questions that are measured using Likert and multiple-choice questions, which are close-ended.

Likert-style rating scale empowers the respondents to be asked how strongly he or she agrees or disagrees with a statement or series of statements. This study utilized 5-point Likert scales to request that the individual investor assess the level of their agreements with the effects of behavioural factors on their investment decisions.

Close-ended questions are prepared for each factor. Close-ended questions have numerous advantages. One of the upsides of using close-ended questions is that they can be pre-coded, along these lines transforming the activity of processing of data for analysis into a less complex one.

Sample Design

Population is defined as the totality of the objects or individuals regarding inferences made in a sampling study. In our case the population was comprising of all the people who invest in stock market. Sample is defined as a smaller representation of a larger whole, whereas sampling is defined as the process of selecting a subset of randomized number of the members of population of the study. The sampling data was collected from people investing in the stock market. For this study a sample size of 121 respondents with varied demographic backgrounds was considered. Samples would be collected from Udaipur and Mumbai for the said analysis.

Sampling technique used for this research was Simple Random sampling, a probability sampling technique where every item in the population has an even chance and likelihood of being selected in the sample. Here the selection of items completely depends on chance or by probability and therefore this sampling technique is also sometimes known as a method of chances.

Methods of Data Analysis

In order to identify and understand the significance between various variables and the aggression level of an investor during investment decision, multiple regression was used

along the course the research. It is an extension of simple linear regression. It is used to predict the value of a variable based on the value of two or more other variables. The variable to be predicted is called the dependent variable.

In our study, the said variable is aggression level of an investor during investment decision. The variables used to predict the value of the dependent variable are called the independent variables, which can be both qualitative and quantitative in nature. This tool helps to determine the overall fit of the model and the relative contribution of each of the predictors to the total variance explained.

Some assumptions are made when we consider multiple regression, they are as follows:

- A linear relationship is assumed between the dependent variable and the independent variables.
- Regression residuals must be normally distributed.
- Absence of multi-collinearity is assumed in the model, meaning that the independent variables are not too highly correlated.

4. Results and Discussion

For the study a sample size of 121 was considered from respondents with varied demographic backgrounds from Udaipur and Mumbai for the analysis. The data was collected for the study by administering questionnaire. The descriptive analysis was carried out to get better insights of the respondents and their elicited responses. The said analysis validated the following statements:

- 44.6 percent of the total respondents were female and remaining 55.4 percent of them are male.
- 11.6 percent of the respondents were 61yrs. and above; 47.9 percent of the respondents belong to the age bracket of 46-60 yrs., 20.7 percent of them belong to the age bracket of 31-45 yrs. Only 19.8 percent of them are below 30yrs.
- 69.4 percent of the respondents were post-graduate and remaining 21.5 percent of them being undergraduate.
- Majority of the respondents have an annual income above 9, 00,000 (in Indian rupees).
- In spite of 56.2 percent of them earning above Rs.9,00,000, majority of the respondents invested less than Rs.1,00,000 in stocks yearly. 38.8 percent respondents invested between Rs.1,00,000 and Rs.5,00,000.

The study proposes a model that aims at predicting the factors that estimate aggression level of an individual during investment decisions. In the said framework, the aggression level of an individual is the dependent variable and the factors that estimate and ascertain it are referred as independent variables which have been elaborated in the research design.

From the data collected via administration of questionnaires through electronic medium, we carried out logistic regression for inferring respondent's aggression level. The respondents are classified based on their aggression level exhibited by one during investment decision, as follows:

- Aggressive investor willing to take risk
- Conservative investor willing to take minimum risk

For the analysis purpose logistic regression-based prediction model for each of above-mentioned category was devised. The said regression-based models were evaluated based on the Nagelkerke R-square values and the overall prediction accuracy of the model. The variables in the regression are selected based on the significance levels.

Aggressive Investor Willing to Take Risk

The respondents in this category are individuals who are willing to take risks and their aggression level are observed to be on the higher end of scale during when making investment decisions. The Nagelkerke R-square value interprets the proportion of variance in the dependent variable associated with the predictor (independent) variables. Larger R-square value indicates that more variation is explained by the model with a categorical dependent variable, to a maximum of 1.

For this regression model, are dependent variable is ART (Aggressive investor willing to take risk). On carrying out logistic regression on SPSS, the Nagelkerke R square value of the regression for the above model is 0.473. With the said constraints and the nature of the study, the value is considered. The below given figure illustrates the output obtained on SPSS.

Model Summary

Table 1: ART Model summary

Step ^a	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	44.277 ^a	0.216	0.473

Estimation terminated at iteration number 8 because parameter estimates changed by less than 0.001

The prediction accuracy of a logistic regression is preferred to be large. The said is evaluated based on the cut off values. The model has the highest accuracy, 93.4% at a cut off value of 0.5. The classification table obtained from SPSS is given below.

Classification Table^a

Table 2: ART Classification Table

Observed		Predicted		
		ART		Percentage Correct
Step 1	ART	.0	1.0	98.2
		108	2	
Overall Percentage		6	5	93.4

The cut off is 0.500

From the above classification table, we can infer that 108 respondents of the total sample are accurately predicted as not aggressive and risk taker; and 5 of them are accurately predicted as aggressive and risk takers.

The change in prediction accuracy with regard to the cut-off is depicted below; since the max accuracy is obtained at 0.5, we set the cut-off for the prediction model as 0.5.

Table 3: ART Cut off

Cut-off	Prediction Accuracy
0.4	92.6%
0.5	93.4%
0.6	91.2%

The variables that predict the aggression are and are considered significant in the model are as follows:

Table 4: ART Variables in Equation
Variables in Equation

		B	S.E	Wald	df	Sig.	Exp(B)
Step 1 ^a	Short-Term Capital Gains	.921	0.414	4.954	1	0.026	2.511
	Minimizing Risk	-1.258	0.400	9.877	1	0.002	0.284
	Firm's Reputation	-1.381	0.484	8.137	1	0.004	0.251
	Foreign Operations of Firm	2.002	0.616	10.549	1	0.001	7.400
	Constant	-2.911	2.903	1.005	1	.316	0.054

Variable(s) entered on step 1: Short-Term Capital Gains, Minimizing Risk, Firm's Reputation, and Foreign Operations of Firm

Thus, the equation for the above regression-based model is

$$P(x) = \frac{e^{-2.911+2.002 X_4-1.381 X_3-1.258 X_2+0.921 X_1}}{1+e^{-2.911+2.002 X_4-1.381 X_3-1.258 X_2+0.921 X_1}}$$

Where P(x) is probability that the person is aggressive and risk taker, and

X₁= Short Term capital Gains

X₂=Minimizing Risk

X₃= Firm's Reputation

X₄=Foreign operations of Firm

Conservative Investor Willing to Take Minimal Risk

For this regression model, are dependent variable is CMRT (Conservative investor willing to take minimal risk). On carrying out logistic regression on SPSS, the Nagelkerke R square value of the regression for the above model is 0.563. With the said constraints and the nature of the study, the value is considered optimal. The below given figure illustrates the output obtained on SPSS.

Table 5: CMRT Model summary
Model Summary

Step ^a	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	80.777 ^a	0.386	0.563

Estimation terminated at iteration number 6 because parameter estimates changed by less than 0.001

As mentioned earlier, the prediction accuracy of a logistic regression is preferred to be large. The said is evaluated based on the cut-off values. The model has the highest

accuracy, 87.6% at a cut off value of 0.4. The classification table obtained from SPSS is given below.

Table 6: CMRT Classification Table
Classification Table^a

Observed		Predicted		
		CMRT		Percentage Correct
Step 1	CMRT	.0	1.0	
				80
	Overall Percentage			87.6

The cut off is 0.400

From the above classification table, we can infer that 80 respondents of the total sample are accurately predicted as not to be conservative and minimal risk taker; and 26 of them are accurately predicted as conservative and minimal risk takers. The change in prediction accuracy with regard to the cut-off is depicted below; since the max accuracy is obtained at 0.4, we set the cut-off for the prediction model as 0.4.

Table 7: CMRT Cut off

Cut-off	Prediction Accuracy
0.3	86%
0.4	87.6%
0.5	85.1%

The variables that predict the aggression are and are considered significant in the model are as follows:

Table 8: CMRT Variables in Equation
Variables in Equation

		B	S.E	Wald	df	Sig.	Exp(B)
Step 1 ^a	Occupation	0.451	.159	8.015	1	0.005	1.569
	Amount invested in stock yearly	-1.673	.565	8.757	1	0.003	.188
	Short-Term capital gains	-0.959	0.273	12.316	1	0.000	0.383
	Minimizing Risk	1.187	0.318	13.897	1	0.000	3.277
	Friend and Co-worker Opinion	.722	0.294	6.016	1	0.014	2.059
	Constant	-3.911	1.723	5.154	1	0.023	0.020

Variable(s) entered on step 1: Occupation, Amount invested in stock yearly, Short-Term Capital Gains, Minimizing Risk, Friend and Co-worker Opinion, and Foreign Operations of Firm.

Thus, the equation for the above regression-based model is

$$P(x) = \frac{e^{-3.991+0.722 X_5+1.187 X_4-0.959 X_3-1.673 X_2-.451 X_1}}{1+e^{-3.991+0.722 X_5+1.187 X_4-0.959 X_3-1.673 X_2-.451 X_1}}$$

Where, P(x) is the probability that the person is conservative and minimal risk taker, and

X₁=Occupation

X₂=Amount invest in stock yearly

X₃=Short Term capital Gains

X₄=Minimizing Risk

X₅=Friend and Co-workers Opinion

5. Major Findings

The hypothesis that were accepted from Factor Analysis are of Short-term capital gains, Long term capital gains, Earnings per share, Stock Price per Share, Family and

Relative Opinion, Friend and Co-Worker Opinion, Size of the Company and GDP. The inferences from the prediction model are as follows:

- Aggressive Investor Willing to Take Risk is dependent on Short-term Capital Gains, Minimizing Risk, Firm's Reputation and Foreign operations of Firm for which the prediction accuracy is found out to be 93.4 percent.
- Conservative Investor Willing to Take Minimal Risk is dependent on Occupation, Amount invest in stock yearly, Short Term Capital Gains, Minimizing Risk and Friend and Co – workers' Opinion for which the prediction accuracy is found out to be 87.6 percent.

6. Conclusion

In today's scenario, investors are considered to be rational wealth maximizers, who follow basic financial rules and base their investment strategies considering only the risk return as the factor that influences investment decisions. But when it actually comes to investing, their thought patterns, emotional inclinations, and psychological biases color how they perceive the world and how they make investment decisions. The said can holistically be considered as investor's aggression level. The focus of the present study is to estimate aggression level of an individual during investment decisions. This study aims at achieving the said by determining the factors that influence the individual investment decisions which includes demographic factors, psychological factors, macroeconomic factors and analytical factors which have been studied by previous researches; and also ascertain their impact on the investor's aggression by creation of prediction models for each type of investor.

7. Limitations

The foremost limitation of the study is that it only considers the investors' behavioral patterns using questionnaires. A second limitation emerges out of the fact that India is a vast nation, and this study as only been conducted in Mumbai and Udaipur, which represents a very small part of Indian population. This research can further be extended in finding out whether there are homogeneous clusters or groups of variables that form identifiable decision determinants that investors rely upon when making stock investment decisions. Further, similar kind of study can be extended to different parts of the country.

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