

**DETERMINANTS OF RETAIL INVESTORS'
BEHAVIOUR IN INVESTMENT DECISIONS: AN
EMPIRICAL ANALYSIS**

For the partial fulfilment of Degree of Doctor of Philosophy

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DECLARATION

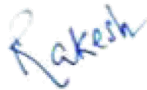
I hereby declare that this thesis “DETERMINANTS OF RETAIL INVESTORS’ BEHAVIOUR IN INVESTMENT DECISIONS: AN EMPIRICAL ANALYSIS” is an original work done by me for the award of Degree of Philosophy in Management. I also declare that this thesis or any other part of it has not been submitted by me for the award of any degree, diploma, title, or recognition before.

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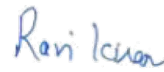
CERTIFICATE

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“Confidence and hard-work is the best medicine to kill the disease called failure. It will make you a successful person.” - Dr A. P. J. Abdul Kalam

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Swati

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ABSTRACT

The Indian economy has shown tremendous growth post-2010; it has been possible due to many reforms taken place in different areas. The primary focus of the Indian government has remained to include all the segments of society in different financial schemes and to provide utmost benefits of these schemes to all sections of society. The government unlocked different avenues for retail investors' to diversify their surplus funds and optimize return on their investment. The government, as well as private organizations, are deeply involved in conducting awareness programs to educate people about financial products. The principal objective is to enhance their knowledge to prepare them for rational decision making by optimizing their investment portfolios.

The main objective of this study was to design a model relating retail investor behaviour and investment decisions. The study is related with retail investors, with the sample from three major states of India. The present study integrates all three dimensions viz., behavioural factors, socio-economic factors, and financial literacy to have an understanding of their impact on investment decisions. The study has highlighted to investigate the financial product preference of the respondents and to analyse the factors influencing investors' behavior. Furthermore, the relations between financial literacy, risk-bearing capacity, and investment decisions are also examined.

Data were collected through a structured questionnaire from the retail investors' of North India. Taking assistance from managers of brokerage firm a sample of 600 respondents were taken for analysis. The analysis was done using structural equation modelling (SEM-AMOS). The behavioural factors considered in the study include: personal factors, herding factors, overconfidence, ability bias, loss aversion, regret bias, endowment bias, and mental accounting respectively. Socio-economic factors included in study are; i) market; ii) firm and iii) social. Investment decision is the dependent factor and it is comprised of: i) prior information, ii) risk, and iii) returns. The study examines the mediation effect of financial literacy on investment decisions. The results of the study revealed that behavioural factors and socio-economic factors have a significant direct and indirect impact on investment decisions through the mediation of financial literacy.

Financial literacy and risk have also a positive impact on investment decisions. This study may be useful for all those prospective investors who want to maximize the value of their investment by paying due attention to highlighted vital and significant factors. It is going to be useful for banks and financial institutions as it will provide knowledge of the impact of financial literacy, behavioral, and socio-economic factors to lure investors towards different financial alternatives.

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LIST OF ABBREVIATIONS

AB	Ability Bias
AGFI	Adjusted Goodness of Fit Index
AMOS	Analysis of Moment Structures
AVE	Average Variance Extracted
BF	Behavioral Factors
EB	Endowment Bias
EMH	Efficient Markets Hypothesis
EPS	Earning Per Share
CAPM	Capital Asset Pricing Model
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
COI	Cost of Investment
CR	Composite Reliability
DF	Degree of Freedom
FCCB	Foreign Currency Convertible Bonds
F	Firm
FL	Financial Literacy
GDP	Gross Domestic Product
GDR	Global Depositary Receipts
GFI	Goodness of Fit Index
GOF	Goodness of Fit
GOI	Gain From Investment
HF	Herding Factor
ID	Investment Decision
LA	Loss Aversion
LV	Loading Value
M	Market
MA	Mental Accounting

NFI	Normed Fit Index
O	Overconfidence
P/E	Price Per Earning
PF	Personal Factor
PI	Prior Information
RB	Regret Bias
RE	Return
RI	Risk
ROI	Return on Investment
RMR	Root Mean Square Residual
RMSEA	Root Mean Square Error of Approximation
S	Social
SEF	Socio-Economic Factors
SEM	Structural Equation Modeling
TLI	Tucker Lewis Index

CHAPTER 1

INTRODUCTION

India is an emerging market economy. As a country, India saves roughly 30 percent of its Gross Domestic Product (GDP) [Economic survey 2020]. The per capita real public and private investment growths dynamic affects per capita real GDP growth of the country. Both variables play important roles in the growth process of developing countries (Rahman, Islam, and Banerjee (2016). To channelize the savings of its citizens, the banking system of India and its capital market reserve an important share.

The financial system of India provides various financial alternatives for saving and investment for its citizens. Investment alternatives that are mostly used for savings are fixed deposits, unit-linked insurance plans, mutual funds, gold, real estate, and industry stocks, etc. Indian market is predominated by equities or shares, primarily due to its high returns as compared to traditional instruments, even though it also carries a very high level of risk. This lures bold investors to participate in the equity or share market. Diversified portfolio increases returns and minimizes risks, leading to enhanced prominence to diversification has in financial markets as well as across the borders. As suggested by Kheng, Mahamad, & Ramayah (2010) information and communication technologies and their application through electronic interfacing have forced the banks to emerge with strategies to enhance customer loyalty. Pandey et al., (2020) suggest that role of product features along with prices influenced satisfaction and trust level of customers. Suri (2005) also highlighted the importance of e-interfacing in changing business space. Therefore it becomes necessary to explore the factors contributing to information that affects the business in terms of its performance. The equity or shares as an investment instrument has been there since Independence in India, however, the equity culture has still been low and just 5 to 6 percent of retail investors participate in the capital market. The low retail investor's participation in the capital market leads to apprehension and demands an intervention.

1.1 Investment

In a generic sense, investment means putting in the effort, time, money, or anything to get some return. In general, investment is related to money and some return out of it is expected to generate. Investors also embrace sacrifices in the present time for the expectation of future benefits. Investment is related with future rewards at the cost of present. It involves several decisions related to category, combination, amount, timing, grade, etc. Investment is done with the purpose and intention to receive excess returns over a period of time. The hopes bring with it a chance that the value of return may vary from the lowest returns to the highest returns. Thus, there is always an investment risk. The risk is borne for prospective return. Economic theory on investment decisions treats the individual's investment decision from a macroeconomic perspective. Retail investors' wealth maximisation predominantly depends on choice of consumption and investment (Merikas, Vozikis, and Prasad, 2004).

Investing encompasses a speculation intended to maximize wealth. Investments are done with a purpose to increase income through interest, dividend or by appreciation of assets, depending on the nature of investment. This will be reflected through buying of stocks, debentures, insurance policies, and post office savings certificates. These investment avenues are financial investments. Investment can be defined in several ways based on different theories. Broadly saying, it can be used in several perspectives. Nature of investment along with tenure of investment interspersed with market variations will lead to frequent changes in returns from investment. Investment is done with the intention to use money to earn more money (Sharma and Kaur, 2016). Before moving to analysing factors influencing retail investors decisions, it is important to cover the characteristics of investments.

1.2 Characteristics of Investment

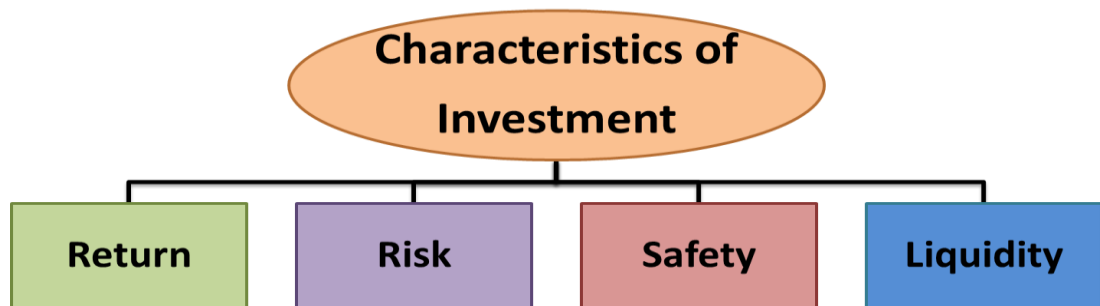


Figure 1.1 Characteristics of Investment

Return - Every investment avenue is categorized by the prospect of a return. The principal purpose of investing is for a higher return. The returns may be through financial profits or through capital appreciation. The prospect of return from an investment hinge on the maturity period, capital demand, the growth levels of the economy and variations in stockmarkets (Sharma & Kaur, 2016).

The Return on Investment (ROI) is calculated as:

$$\text{ROI} = (\text{GOI}-\text{COI}) / (\text{COI}) * 100$$

Where, GOI = Gain from Investment

COI = Cost of Investment

Risk - It is the chance that the actual return is unlike from the probable return. Probable return is the chance of making a profit or loss money on your investment. For majority of investors the risk money loss is a major risk, thus they would like to go in for safe investment. However they want returns to be maximum, and for they are willing to take risk. Risk is broadly categorized as:

- ❖ Systematic risk – Inherent risk existing in the stock market. This risk applies to all sectors, and it can be controlled. It is volatility risk.
- ❖ Unsystematic risk – This risk is unique to a specific company. It is also classified as specific risk or residual risk.

Safety - Investment safety is the expectation of return within the stipulated period. Safety feature of investment is expected by retail investors. Investor expect initial capital on maturity, expecting ensured returns. Investors desire assured money over time.

Liquidity - Liquidity means how easily the assets can be converted into cash. If the investment is done for covering financial emergencies, then liquidity aspect is considered. Money market investment and savings accounts possess the highest liquidity.

1.3 Investments Alternatives

Investors formulate their investment strategy giving due importance to investable funds, investment objectives and knowledge about various resources. Every investment process around the investable funds is generated through savings or borrowings. Requisite return, regularity of income, risk perception, and liquidity are the major objectives of investors. However investors need to possess knowledge of the investment alternatives. Figure 1.2 highlights the investment alternatives (*Sharma & Kaur, 2016*).

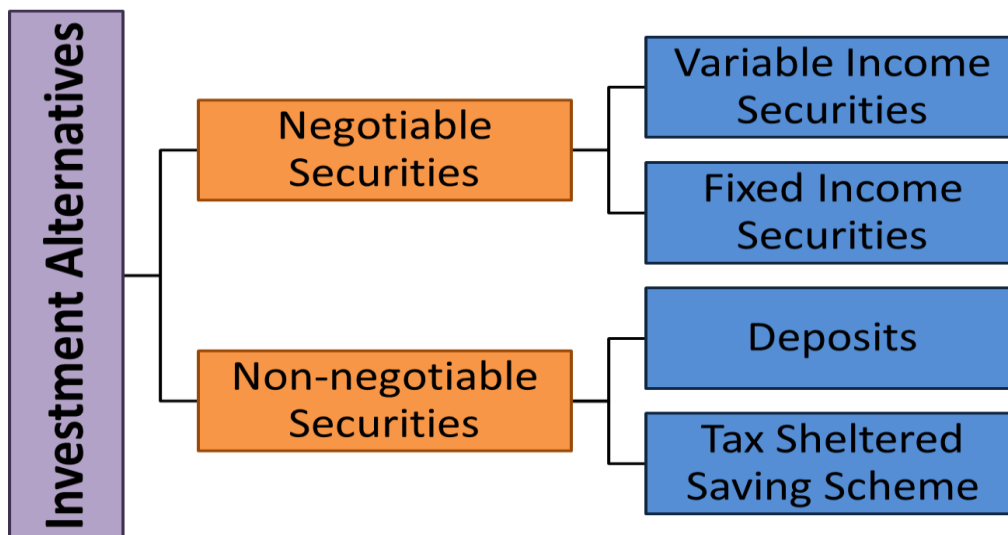


Figure 1.2 Investments Alternatives

Negotiable Securities

Negotiable securities are easily convertible. These may be fixed income securities or may yield variable income.

Variable Income Securities

- a) *Equity share* – Investment in equity ensures an ownership right along with dividends. This is plausible through initial public offering and also through the secondary market. They are also vested with voting right.
- b) *Growth shares*- These shares ensure rewards for growth in values. The earnings are expected to increase at a faster rate than average companies.
- c) *Income shares*- The Company that gives a large dividend to investors relative to the market price. Such shares are income shares.
- d) *Defensive Shares*- Such shares are not affected by market activities.
- e) *Cyclical Shares*- Stocks where variation occurs due to business cycles. Infrastructure, heavy goods industries which are capital intensive are more prone to cyclical fluctuations.
- f) *Speculative Shares*-These are those shares where a lot of speculative trading happens.

Fixed Income Securities

- a) *Preference shares*- Preference share possess some characteristic of equities, however unlike equities that are entitled to fixed investment. On liquidation they have a priority over equity share owners. In some cases their dividends are cumulative.
- b) *Debentures*- Debentures are long-term debts and are a sort of loan provided to company. Debentures could be redeemable as well. As debentures are loans they are entitled to fixed interests. They don't possess an ownership right but have a priority in terms of payment.
- c) *Bonds*- These are similar to debentures, but they are issued by the public sector undertakings.
- d) *Depository Receipts (GDRs/ADRs)*- Depository Receipts are issued to non-resident investors against Foreign Currency Convertible Bonds (FCCBs).

- e) *Government Securities*- These securities are issued by the central or state government.
- f) *Money market securities*- Money market securities have very short term maturity. The maturity period varies from a day to a year. These are :
 - i. Treasury Bills
 - ii. Commercial Papers
 - iii. Certificate of Deposit

Non-negotiable Securities

These securities are financial securities that are not easily transferable.

Deposits

Deposits earn a fixed rate of return for specified period of time.

- a) *Bank Deposits*- Bank deposits are the simple investment avenues open for investors.
- b) *Post Office Deposits*- These are non-marketable investment alternatives. Though, mostly savings plans in post offices enjoy tax rebate schemes. Savings deposits and fixed deposits are the major schemes attracting retail investors.

Tax Sheltered Saving Scheme

Tax-sheltered saving schemes offer tax relaxation to those investors who contribute to these schemes according to the income tax laws.

- a) *Public Provident Fund scheme*- These schemes are deposit schemes. These are relevant for employees in public as well as private sector.
- b) *The national saving scheme (NSS)* - These are also much sought after schemes of post office. This is important as they also help in deferring the tax payment.

Apart from these options there are certain other alternatives too. These are explained below:

Some Other Alternatives

- a) *Life Insurance*- This is a contract for payment to the investors for the event insured against.

- b) *Mutual Funds*- Mutual funds were started to lure small investors to invest, so that they can add to investment needed for growth of economy as well as lure them to get high returns of stock markets. Their individual low levels of savings would not permit them to invest in stock market. Selling their units firms can raise more capital needed for growth.
- c) *Real Assets*- These are very lucrative, however they are different from financial assets.
- d) *Bullion*- Investors invest in the bullion market, buying gold, silver, and other metals.
- e) *Real Estate*- Real estate means land, buildings, and Motor vehicles. This market gives very high returns to investors.
- f) *Art*- Paintings are in most demand in art.
- g) *Antique*- An antique is an object of historical interest.

The Investments alternatives have been discussed as it is pertinent to recognize the product preferences of retail investors along with their objectives for investment. Next section covers the investment process:

1.4 Investment Process

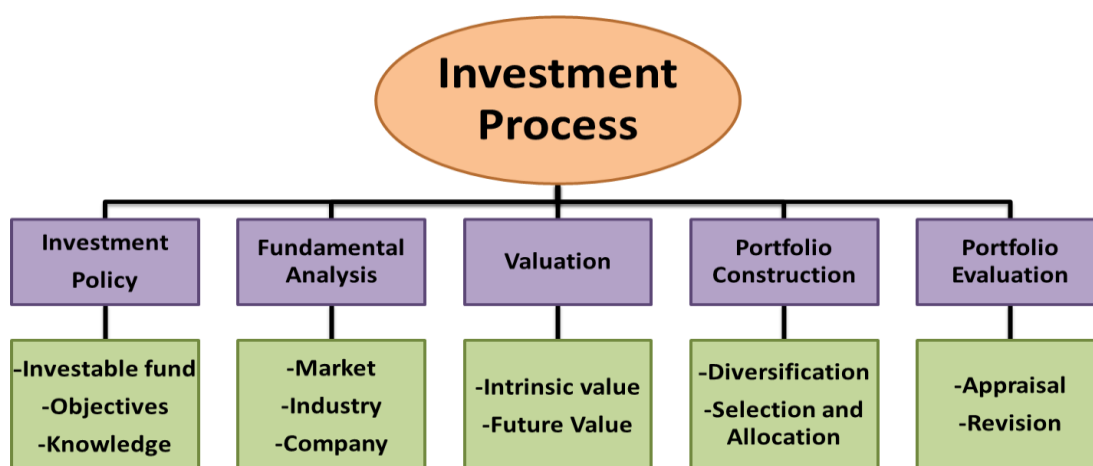


Figure 1.3 Investment Process

Before deciding on an investment, investors formulate the investment strategy by taking into consideration investable funds along with the objectives of investment. Every

investment processes investable funds either generated through savings or borrowings. The promises of the need for liquidity, essential rate of return, risk perception, and need for regularity of income are framed on objectives and investors knowledge. Sound knowledge of market conditions and industry matters a lot in investment along. In the company, analysis investors should know about the decision of the company over some time. Also in the analysis, we compare the decision of a company with other companies operating in the same industry. Valuation helps the investors to know about risk and return on a specific stock where they have invested. The intrinsic value helps to know the prospects of stocks. The investor's goals and objectives help in portfolio construction. The deduction of risk (loss of income and capital) is the key objective of diversification. For this purpose, the investor is required to diversify his portfolio in such a way, that overall risk reduces and returns optimize. The efficient management of portfolio demands time to time evaluation based on market fluctuations. This procedure involves portfolio appraisal and revision (Punithavathy, 2009).

1.5 Investment Theories

Efficient Frontier - This theory was introduced by Harry Markowitz et al., in 1952. These represent a set of optimum portfolios offer the maximum expected return for the lowest risk for a given level of expected return.

Capital Asset Pricing Model (CAPM) – The CAPM model offers a structure to decide the rate of return on capital and indicates the association between return and risk. The CAPM was developed in 1960s by William Sharpe (1964), Jack Treynor (1962), John Lintner (1965) and Jan Mossin (1966).

$$E (r_i) = R_f + \beta_i(E(r_m) - R_f)$$

E (r_i) = return required on financial asset i

R_f = risk-free rate of return

β_i = beta value for financial asset i

E (r_m) = average return on the capital market

Prospect Theory: This was devised by Daniel Kahneman & Amos Tversky. It is a behavioural model (1979) to help people decide between alternatives involving risk and uncertainty. According to this theory given the option, people prefer certain gains rather than the prospect of more gains with higher risk. Prospect theory has initiated a lot of discussion and attracted many researchers to understand the behavioural aspects involved in retail investors decision making.

The current research focuses on retail investors, so the next section deals with retail investors.

1.6 Retail Investors'

Retail Investors are people who buy and sell securities using their account. When an investor buys and sells stocks prospect theory is used. When an investor is having choices, one expressed in terms of probable profits and the other in probable losses. The answer is obvious as to what would be the choice? Traditional theories of finance rely on models where the retail investor is a rational investor. These rational investors value stocks relying on information related to risk and return. Traditional economic analyses are based on the efficient markets hypothesis (EMH). According to EMH, all retail investors will get similar information, which is instantly reflected in the stock prices so, nobody can gain extra returns. Retail investor trading has become most important in finance.

Retail investor demand for liquidity of investment represents a basis of income for order flow providers (Burghardt, 2010). The Indian retail investors have often suffered a sluggish economy especially due to illegal accounting practices related to insider trading in many firms. The stock market outcomes many times result from emotions and dependent on analysts perspectives. With loads of information the outcomes are dominated by calculations of financial experts, there are a number of irrational factors like fear, overconfidence, risk aversion, etc. influencing retail investors' decisions (Nayaki and Prema, 2007). Foreign investors also suffer from certain biases while investing in overseas markets. Predominant among them is the familiarity bias. Familiarity bias related with our tendency to seek things with which we are relaxed.

Other foreign investor biases are the risk of the specific and the tyranny of the media (Lawrence, 2009; Brewster, 2008).

Singla and Hiray (2019) accepted social recognition and comfortable life as the valid measures of hedonism to influence stock market investors. These also were predominant in real estate and other investment instruments. They also found that age and income negatively affected hedonism.

1.7 Retail Investors' Behaviour

The investor's rationality was the major hypothesis of research in finance. The basic supposition was that equity prices were fixed by rational investors' expectations and responses. This covers objective treatment of existing and latent information. This helped to capture the equity price activities by its simple and rational treatment and lead to its domination in finance for a long time. However, recently the financial academic researchers' enthusiasm for this hypothesis is fading. Decision theory with major contributions from as Raiffa and Schlaifer (1961) and Von Neumann and Morgenstern (1943) are currently influencing retail investors decision making. Researchers in finance were encouraged to break off from this hypothesis and there emerged psychological biases influencing investors' decisions and responses. These consequently helped to explain the retail investors behavior.

In the present study, the researcher attempts to examine the retail investors' behavior and its influence on investment decisions taking. Behavioural finance literature suggests mental accounting (Thaler, 1985), psychological biases provide plausible explanations for investor's behaviour (e.g. the disposition effect). Behavioural finance analyst apply the psychological biases to explain the behaviour of investors in stock markets. The indulgence and reliance of behavioural factors called for a drift from the assumption of full rationality. There was initially a mixed response, however, there were many reasons to accept the effect of behavioural factors on investment decision. In further developments, Sharma and Sharma (2006) found minimization of the risk and maximization of the expected return as the generic problem in investment decision-making so, they suggested solving the problem with the help of multi-objective

decision-making tools such as a lexicographic goal programming. Through this, the investors can achieve their major objectives of making an efficient portfolio and meeting multi-objective of investment goals.

Retail investors individual decisions may not matter a lot, however, if investors' trade is collated, then the impact would be much more. This may be possible by certain factors, like herd mentality. Burghardt (2010) highlights that retail investors are more prone to biases. This has attracted the attention of researchers to examine their impact on investment decisions. Prakash, Nauriyal & Kaur (2017) indicated that even though the financial integration among the equity markets of BRICS is improving. There is still need for harmonization of laws and processes to curtail the risk of financial integration. Thus, it can be inferred that investor sentiment needs to be given due respect and there may be focus of how behavioural factors influence investment decisions. Investor sentiment matters a lot in behavioural finance. The sentiment is the general attitude of investors toward specific security and bigger financial market. The study by Aggarwal, Rai, Jaiswal, and Sorensen highlights that trust is not the same as trustworthiness and all the three dimensions of trustworthiness-ability, competence, and benevolence-need to be included in trust studies.

Diverse factors that influence the behaviour of individual investors. These factors are: economic, psychological, social, and demographic. The most common behavioural factors are herding, over-reaction, cognitive bias, overconfidence. The demographics factors, like gender, age, income, education etc also are important for analysis. Kaur and Kaur (2016) analyzed the gender wage differential in the case of all the occupations. This is the basis in caste, location, marital status, experience, health status, activity, level of skill of the females both in the case of regular and casual workers in the agricultural and non-agricultural sector. Ali and Sabhir (2017) attributed females to be better performers than males. Aggarwal, Rai, Jaiswal, and Sorensen (2018) highlighted that while personal trust was dominant for women artists, institutional trust dominated in case market partnership. This is equally relevant for current management decisions as well.

Risk, prior information and Returns are components of Investment decisions. There are certain socio-economic factors, too which are important in investment decisions. The study by Parkhimenka, Tatur & Zhvakina (2017) focused on a heuristic approach to treat the problem of methodological diversity for first approximation to find useful patterns and facts in the data. Yadav, Upadhyaya, and Sharma (2012) examined that the tax variable has a larger impact on private consumption to affect the GDP. Thus, in management decisions, gender differential is considered important. Many researchers have included this as an important demographic variable influencing investment decisions. Equally important are: stock marketability, predictable losses in international financial markets, diversification purpose in investment, inflation, tax consequences of an investment, trading opportunity, observed ethics of the firm, publicity, economic expectation, the structure of the board of directors of companies, brand perception, social responsibility, and control orientation. Financial literacy is very important and plays important role in investment decisions, the current research is an effort to examine the influence of behavioural and socio-economic factors on investment decisions with the mediation effect of financial literacy.

1.8 Research Problem

In view of above context it becomes important to examine the influence of behavioural and socio-economic factors on investment decisions taking the mediation effect of financial literacy.

1.9 Objectives of the Study

The main objectives of the study are:

- To investigate the financial product preference of the retail investors.
- To analyze the factors influencing investors' behaviour.
- To examine the relation between risk-bearing capacity and investment decisions.
- To examine the relation between financial literacy and investment decisions.

- To design a model relating to retail investors' behaviour and investment decisions.

1.10 Significances of the research

To the retail investors: This research will be useful for all those prospective retail investors' who want to maximize the value of their investment and it will also be helpful for an investor to choose the right kind of investment alternative.

To the Financial & Government organization: Banks and financial institutions will benefited. This would help to recognize the relation of behavioural and socio-economic factors with investment decisions. This study would be helpful to initiate adequate steps to induce investors by focusing on factors that emerge significant.

To the researchers: This research will be useful from academic perspective, contribute to academic literature. It will be useful to the researchers to realize the factors that influence investment decisions.

1.11 Structure of the study

The thesis has five chapters. The structure of the study has been shown in figure 1.4.

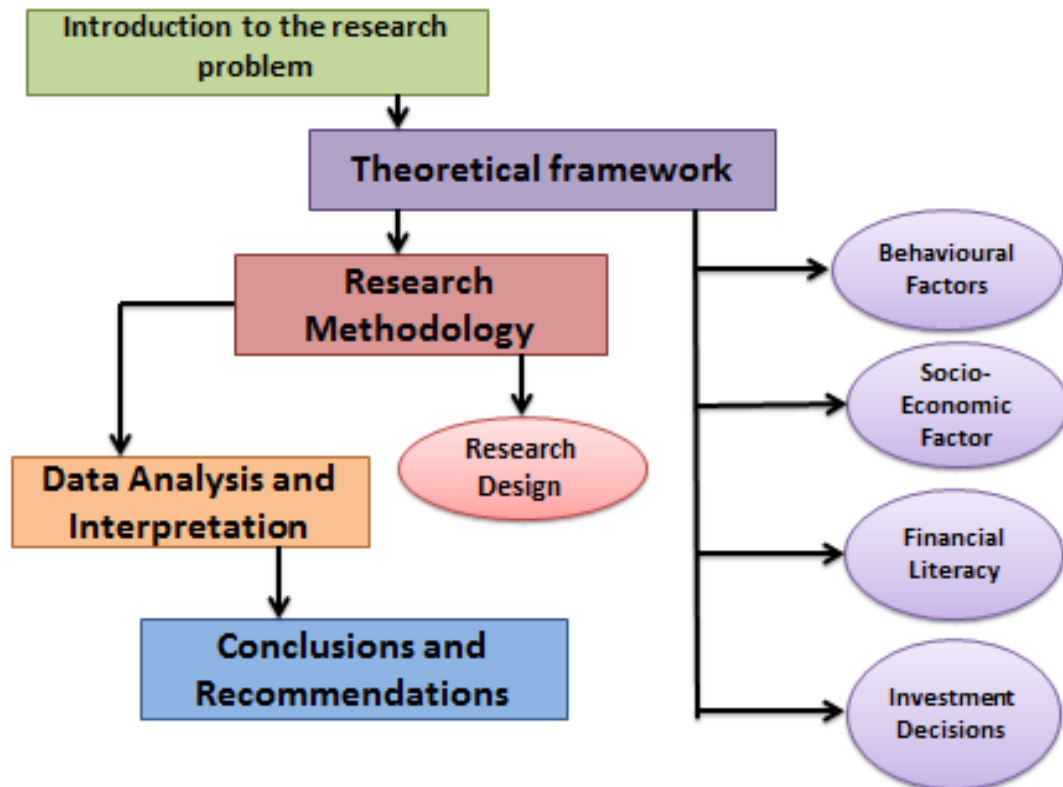


Figure 1.4: The structure of the study

CHAPTER 2
REVIEW OF LITERATURE AND HYPOTHESES
DEVELOPMENT

Any new research will have to rely on earlier literature, to examine the contribution of earlier researchers. This helps to define the objectives of research, avoid duplication of research and helps to induce novelty by providing a right direction. This chapter discusses the work done by earlier researchers on this chosen area. The literature review is categorized into four sections:

2.1 Behavioural Factors and Investment Decision

2.2 Socio-Economic Factors and Investment Decision

2.3 Risk and Investment Decision

2.4 Financial Literacy and Investment Decision

Distribution of money is influenced by investment, savings, and consumption. From these three parameters, the type of distribution that provides the most benefits in the future is the financial investment (Masassya, 2006). The investment decision process in personal finance is important because it is a self-determining learning process and helps to manage the financial investment in the present and in the future (Pritazahara, 2015). Mehmet et al. (2015) supported that investors' are influenced by past investment experiences, financial stability, level of income, and other investors' opinions. Chandra et.al. (2012) corroborated that the income level influenced investment decisions making. Investors with high self-esteem try to diversify risk. Portfolio practices, preferences, risk observations influenced retail investors' decision making (Kaur et al., 2012; Jagongo et. al., 2014). Risk-taking is inversely related with age and Senior/ Retired retail investors are low in taking risk (Al Ajmi, 2008). A few investors rely on fund related qualities and fund managers (Rangarajan, 2006).

As the current research is embedded to relate behavioural factors, socio-economic factors with investment decisions taking the mediation effect of financial literacy, it is imperative to cover earlier researchers' perspectives regarding these.

2.1 Behavioural Factors and Investment Decision

Investment behavioural factors focus on the investors' understanding of the performance of the capital market and market volatility (Gao and Schmidt, 2005). Thus, investors cannot ignore the behavioural elements of investment decisions-making. Investors believe that decision-making of investment is strongly influenced by behavioural factors as this helps to understand and explain feelings (Waweru et al., 2008). Investment decisions are significantly influenced by many factors or biases e.g. cognitive bias, loss aversion bias, and overconfidence biases. These biases have an inherent role in the behavioural finance (Shah et. al., 2017). The eight behavioural factors included in the current study are personal factors, herding factors, overconfidence, ability bias, mental accounting, loss aversion, regret bias, and endowment bias.

Loss aversion highlights that both positive and negative returns in the past can enhance the negative relation between the selling trend and capital losses. This suggests that investor are loss averse (Lehenkari and Perttunen, 2004). Investors' are more worried about the losses, and less contented by the same gain (Barberis and Thaler, 2003). Moreover, a loss seems to be more painful, while a loss compensating after the earlier gain is considered to be not as painful (Barberis and Huang, 2001).

There is rich literature suggesting that overconfidence has a stimulating effect on investment decisions making (Bashir et al. 2013, Lim, 2014, Qadri and Shabbir, 2014, and Qureshi et. al., 2012). There are two components of overconfidence: the ability to act on given information to use at the right time for the highest profit; and the other one is the quality of your information. In earlier studies, overconfident investors' traded more regularly and failed to properly diversify portfolios (Kourtidis and Sevic and Chatzoglou, 2011). According to Trivers (1991), Overconfident Investors have a predisposition to consider that they are superior than others. Overconfident investors

always expect to get high returns on the period of the successful financial markets and such retail investors relate their expected profit with their abilities, and their losses are accredited to “bad luck” (Campbell et.al., 2004, Lichtenstein et, al., 1982). The contradictions in earlier studies highlight a need for more detailed analysis.

A few researchers have concluded that overconfidence; availability bias; regret bias, and conservatism bias are positively related with investment decisions (Lim, 2014), Luu, 2014, Kengatharan and Kengatharan, 2014). Herding behavior was an exception and was not influencing investors’ investment decisions. Khan et. al., (2017) opined that in investment, behavioural factors influenced retail investors’ decision-making. The researchers also suggested that minimizing overconfidence can lead to efficient investment behaviors. As suggested by Takeda et.al, (2013) financial literacy lead to overconfidence bias, often resulted in biased decisions. These were biased but cannot be called undisciplined decisions

Financial advisers are overconfident and believe to expect a higher return in investment projects (Pikulina et.al.,2017; Ben-David et al., 2013; Graham et al., 2013; Campbell et al., 2011; Goel &Thakor, 2008; Malmendier & Tate, 2005). Overestimation of knowledge and strong belief in one’s abilities are the main reasons for this and results in Excessive optimism. Being loss averse, they trade a lot (Shefrin and Statman, 2000). In United Kingdom (UK) online brokerage traders found that the overconfidence effect led to increased trading probably due to positive returns, despite wrong prediction methods (Merkel, 2017). According to Moore and Healy, (2008), there is a negative relation of overestimation with investment decisions. The research studies of Atif (2014); Merkel (2017) and Kengatharan & Kengatharan (2014) highlight overconfidence to be negatively associated with decision making. Bakar and Yi (2016) examined how investor’s overconfidence, conservatism, availability, and conservatism bias influenced investment decisions’. They found that in the Malaysian equity market the dependency of behavioural factors was found gender-dependent, however herding factor was not identified. Investment decisions positively correlated with age and family structure. A strong relation of age and family structure leads to overconfidence in the retail investors (Mahalakshmi & Anuradha, 2018).

Investment decisions are also affected by cognitive biases (Baker and Wurgler, 2013; Ben-David et.al., 2013; Malmendier et.al., 2011). Waweru et al., (2008) found that investment decisions are strongly influenced by behavioural factors, which helped in understanding cognitive errors and feelings of investors. According to Ritter (2003), investment decision processes are based on several cognitive illusions. Investors want to avoid regret by denying to sell and buy underperformed shares (Fogel & Berry, 2006; Lehenkari & Perttunen, 2004).

Regret is based on the sentiments of retail investors. Regret is pain associated with a feeling and is responsible for the loss. Regret influences the investment decisions (Shefrin, 2002). Investors preferred to sell those shares who have lost value and would like to invest in those stocks which have gained value (Shiller, 1997). Thus, regret bias also has an impact on investment decisions.

Mental accounting permits retail investors to manage their portfolios in one account (Barberis & Thaler, 2003; Ritter, 2003). According to Kivetz (1999) the set of cognitive biases are used by retail investors to consolidate, calculate, and observe financial market activities. Literate investors having intense trading behavior could profit from important results (Anderson et. al., 2005).

Herding bias is one of the reason for volatility in the market. Herding will depend on the investors' reactions of purchasing and selling the stock, making theoretical bubbles phenomenon, therefore, making the capital market ineffective to investment decision (Luong and Thu Ha, 2011). According to Wamae (2013) herding has a substantial effect on decision making. This was further reinforced by Kengatharan & Kengatharan (2014). On the other hand Lim (2012) who reported that herding is not positively related with investment decision. Gunay (2011) endorsed a positive relationship between herding and demographics factors, however this was not true for age. Drehmann, Oechssler and Roider (2005) requested 6400 investors to decide to invest or not to invest in the same company. The researchers found herding factor didn't influence investment decisions. Thus, there are many studies reporting varied effects, hence it

was decided to include herding element in the research to see its impact on decision making.

There are several researchers' analysing Indian retail investors' investment design and consciousness of different investment tools (Chaturvedi and Khare, 2012; Sornaganesh and Helina, 2018; Atkinson and Messy, 2011; Salem 2019). They investigated how demographic factors, viz. age, education, income level of the retail investors influenced investment decisions. Results demonstrated that female investors have low level of financial literacy, as compared to male investors. Thus, they less frequently invested in share market. According to Shan Lei (2019) financial advisors' have a vibrant and strong role in goal-setting in investment decision-making. Thus, though there are many studies relating behavioural factors with investment decisions, however there are varied results across economies as well over different time periods. Initially this study will focus on examining the relation between behavioural factors and investment decisions. The details of behavioural factors construct used in the study has been shown through table 2.1.

The related Hypothesis is

H1: There is a relation between behavioural factors and investment decisions.

Table 2.1: Author-wise index of Behavioural Factors

Behavioural Factors (BF)	Items	Authors (Year)
Personal Factors	Personal income influences Investment decisions.	Asaad, C. T. (2015)
	Life style influences Investment decisions.	Klapper, Lusardi & Panos (2013)
	Family income affects Investment decisions.	Faulkner (2015)
	Family expenditure affects Investment decisions.	Lusardi (2015),
	Income from other sources (Rent from house property, interest, royalty etc) influence Investment decisions.	Agarwal, Amromin et. Al.,(2015)
	Future plan affects Investment decisions.	Cutler (2013)

Herding Factors	Peer stock selection criteria significantly influence investor's decisions.	Mandell & Klein(2009)
	Other investors' decisions of the stock volume have impact on Investment decisions.	Asaad (2015), Faulkner (2015),
	Other investors' decisions of buying and selling stocks have impact on Investment decisions.	Jayaraj (2013), Musundi (2014),
	Usually react quickly to the changes of other investors' decisions and follow their reactions to the stock market.	Aren & Zengin (2016)
Overconfidence	Believe that Knowledge of stock market can help to outperform the market.	Klapper, Lusardi & Panos (2013)
	Normally able to anticipate the end of good or poor.	Worthington (2006)
	Optimistic when the market goes up, assuming it will continue to do so.	Almenberg(2015)
	Consistently time the market.	Asaad (2015)
Ability Bias	Forecast the changes in stock prices in the future based on the recent stock prices	Mandell & Klein (2009)
	Prefer to buy local stocks than international stocks because the information of local stocks is more available.	Cutler (2013)
	Capable of ability to gauge market changes accurately.	Asaad (2015)
Loss Aversion	More stressed by prospective losses.	Lusardi (2015),
	Avoid selling shares that have decreased in value	Asaad (2015)
	Willingly remain in a risky stock position, hoping the price will bounce back	Faulkner (2015)
	After a prior loss, become more risk averse.	Almenberg (2015)
	Believe that today's losers may soon outperform today's winners.	Jayaraj (2013)
Regret Bias	While selling a stock, become emotionally affected by the price at this purchased the stock.	Agarwal, Amromin et. Al.,(2015),
	Avoid selling a stock to avoid the regret of having made a bad investment.	Klapper, Lusardi & Panos (2013),
	Regret when find a stock considered buying but did not went up in value.	Musundi (2014)
	Conventional wisdom and buy only stocks that everyone else is buying.	Cutler (2013)
Mental Accounting	Hesitate to sell an investment that once had monstrous gains and now has a modest gain	Klapper, Lusardi & Panos (2013),

	During an economic boom and bullish market, get accustomed to healthy gains	Faulkner (2015),
	When the market correction deflates investor's net worth, hesitant to sell at the smaller profit margin.	Aren & Zengin (2016)
	Wait for the return of the gainful period to sell your stock.	Musundi (2014)

Source: Authors compilation

2.2 Socio-Economic Factors and Investment Decision

There are many studies relating only economic factors with investment decision making. There are other researchers relating social factors with investment decision making. This study focuses on examining how socio-economic factors influenced investment decisions. There is need to examine whether there is strong impact of Socio-economic factors on investment decisions. The three socio-economic factors considered in this study after literature survey are i) Market; ii) Firm and iii) Social.

Investment is often related to the valuation of firms' financial positions including earning per share (Easley et.al, 2010). Investors try to find information related with firms' finances (Chong and Lal, 2011). The timing of information influenced their investment decisions (Gupta and Negi, 2014). Hanson et al., (2018) opined that individual investors' biases have an important relation with the individual investor's behaviour in the market. They also found that markets were not found to be fully effective and individual investors' behaviour was dominated by cognitive psychology. Thus, along with behavioural factors it is important to consider socio-economic factors too. Mehta, Jain, and Yadav (2014) found that market response influences stock dividend decisions. They found returns, liquidity, and risk depended on market reactions. The company's accounting information, expected corporate earnings, ownership structure, past performance, bonus payments have an influence on financial decision making (Shafi, 2014).

The socio-economic factors influenced rural investors' earnings, expenses, and savings habits. These factors also influenced their savings modes and investment alternatives. Thilakam (2012) tried to estimate Indian rural investor's knowledge of financial

investment. Retail investors who have risk-taking capacity preferred to invest in the financial market or share market and retail investors who avoided risk select invested in real assets, gold, saving accounts, and bank accounts (Lutfi, 2010). Banks were the major segment of the financial sector in India. There is a need for a well-defined framework which will lead the banks towards growth and progression in our Indian economy (Mahajan and Sharma, 2019). The private banks outperformed the state banks in case of service orientation as well as in financial performance. This supports that service orientation may enhance firm performance in transitional markets (Lynn, Lytle and Bobek, 2000). The positive role of bank perceptions in trust and customer loyalty is authenticated by investors. It will help to attract investors for bank investment schemes (Osakwe et al., 2020). Thus the studies highlight the bearing socio-economic factors have on investment decisions.

Salim et. al., (2010) found the international associations between age structure and saving behavior in investment. The researchers highlighted its influence on capital flows and real exchange rates. The results of Tan *et al.* (2008) highlighted that A-shares were for domestic traders, who possessed less professional knowledge compared to international institutional investment. The herding behavior was similar in Shanghai Stock Exchange (SHSE or SH Exchange) as well as Shenzhen Stock Exchange (SZSE or SZ Exchange). Economou, Kostakis, and Philippas (2011) examined how retail investors take decisions during different financial market conditions. They collected daily data across Greek, Italian, Portuguese, and Spanish capital markets and get the herding factor effects were most in times of rising markets in these capital markets.

Factors that influence individual investors' behavior at the time of investment decisions include accounting information, social relevance, firm-image coincidence, personal financing need, and classical wealth-maximization criteria (Nagy et al., 1994; Dawar et al, 2011; Danso et al. 2019). As indicated by Heshmat (2012) Earnings per share (EPS), status of company, price earnings ratio (P/E), and volatility in stock price influence investment decisions. The details of Socio-economic construct is given in Table 2.2.

The related Hypothesis is

H2: There is a relation between Socio-Economic Factors and investment decisions.

Table 2.2: Author wise index of Socio-Economic Factors

Socio-Economic Factors (SEF)	Items	Authors (Year)
Market Factors	The price changes of stocks that intend to invest.	Klapper, Lusardi, & Panos (2013)
	Market information is important for stock investment.	Mandell & Klein (2009)
	The past trends of stocks under your consideration for your investment.	Musundi (2014)
	A track of market changes to help you in investment.	Almenberg (2015)
Firm Factors	Firm's image before investment.	Mandell & Klein (2009)
	Past investment experiences in firms before investment.	Jappelli & Padula (2013)
	Concerned about security grading before investment.	Faulkner (2015), Jayaraj (2013)
	Invest in firms which have are socially responsible.	Musundi (2014)
	Norms and Values of Firms Influences investment.	Almenberg (2015)
	Firms with environmental and social concerns have a higher implied cost of equity capital.	Cutler (2013)
Social Factors	Investment is affected by Social Structure.	Klapper, Lusardi & Panos (2013)
	Investment is affected by Religious views.	Lusardi (2015)
	Investment is affected by Political views.	Asaad (2015)
	Family structure affects investment Behaviour.	Klapper, Lusardi & Panos (2013)
	Family financial budget affects investment Behaviour.	Musundi (2014)

Source: Authors compilation

After covering literature on behavioural factors and socio-economic factors, the next section discusses earlier researchers' perspectives on relation of financial literacy and investment decisions.

2.3 Risk and Investment Decision

Investment decisions vary from individual to individual. Investors' decisions are linked with risk, ambiguity, and choice overload. Accounting information is very important in case of risky investment avenues and preference for risky investments decreases with age (Lodhi, 2014). Experienced investors' take the best investment decision with a high confidence and manage risk appropriately (Awais *et al.*, 2016). The Indian government, particularly the Reserve Bank of India helped to increase the financial literacy of the general people (OECD, 2005). There are studies relating literacy and investment in risky avenues.

One of the important characteristics of investment decisions is risk craving. Gender and marital status have been reported to be narrowly related to the risk of individual investors. Male investors are frequently more careful about risky investments than the female investors. In investment decisions, single investors prefer to take more risks than married investors. Income and level of education factors also influenced investor's behavior in taking risks (Kumar and Babu, 2018; Nguyen, 2014). Dalton and Dalton (2004) reported that if investors want to invest comfortably, it is called risk-taking capacity (Roszkowski, 1992). Low-income investors have a negative opinion on the risk sensitivity (Khan, 2016).

Many researchers support risk perception is positively related with investment decision (Ameriks, 2003; Lusardi and Mitchell, 2007; Marcolin and Abraham, 2006; Moore 2003; Huston, 2010; Liu, Tsai, Wang and Zhu, 2010). Investors who take the risk, invest more. In different words, the risk-taking capacity of investors encourages them to invest. Risk perception influenced individual investors as well as institutional financial decisions making (Zhong, Xiao, 1995).

Bertrand and Lapointe, (2018) found that risk-bearing capacity reflects a character that leads to apprehension to decide to invest for a gain. Risk aversion may lead to an incorrect decision reducing investor's wealth (Odean, 1998). According to Evans (2004), an older person has more risk-taking capacity than others because they have more knowledge and experience about the investment decision. According to Utami and Kartini (2017), investors get more and more returns as their level of confidence increases. Pratiwi (2015) believed risk taking increases with time and with investment experience. Ofir and Wiener (2012) examining investors behavior in Jerusalem, took a binary choice of investment choices. The results supported that behavioural factors influenced investment decisions.

Risk and returns are integral for investment decisions. Researchers associate higher risk with higher estimated profits. Rational retail investors can minimize the risk of investment and carefully make financial decisions (Pratiwi and Prijati, 2015). An investment decision can be associated with risk, return, and financial literacy. Personal behavior and biases are playing their role in investment decision making. They also found women have been more risk-taking capacity than men. Married investors are more careful about their investments and financial literate investors take risk aversion action. Individual investors invest in different investment avenues with the help of financial literacy, risk and return (Aren and Aydemir, 2014; Abdeldayem, 2016). Yurttadur (2019) opined that Investment decisions of retail investors were very difficult to understand. Based on traditional finance theories, retail investors were very rational and due to psychological factors, retail investors demonstrated different behaviors resulting from behavioural biases. Retail investor's level of information, commitment, and interest played a significant role in a successful role in investment decision making (Singh and Sharma, 2016). Investors tend to gather additional information related to risk tolerance, investment preferences, investment goals (Agarwal et.al, 2015). Garling et al. (2009) has associated risk awareness with investment decision-making process. The behavioural factors dominate in investment decisions. Investing in the share market is associated with high risks and unassured returns (Tabassum and Pardhasaradhi, 2012). The details of Investment decision construct are shown through table 2.3.

The related Hypothesis are:

H3: There is a relation between risk-bearing capacity and investment decisions.

Table 2.3: Author-wise index of Investment decisions

Investment Decisions (ID)	Items	Authors (Year)
Returns	The return rates of recent stock investment meet expectation.	Faulkner (2015)
	Rate of return is recently equal to or higher than the average return rate of the market.	Jayaraj (2013)
	Feel satisfied with Investment decisions in the last year (including selling, buying, choosing stocks, and deciding the stock volumes).	Van Rooij, Lusardi & Alessie (2011)
	The longer the time-horizon, the greater are the returns on investment.	Musundi (2014)
Risk	Understanding capacity to take on risk becomes a crucial factor in Investment decisions making.	Mandell, & Klein (2009)
	Riskier investments are expected to be more profitable.	Jappelli, & Padula (2013)
	Reduce risk through portfolio diversification.	Cutler (2013)
	Invest in stocks having higher Beta values.	Faulkner (2015)
Prior Information	Information of high rank on listing day influences Investment decisions.	Agarwal, Amromin et. Al.,(2015)
	Active trading information of stocks in market during past period influences Investment decisions.	Asaad (2015), Cutler (2013),
	Information related to market capitalization influences Investment decisions.	Jayaraj (2013)

Source: Authors compilation

2.4 Financial Literacy and Investment Decision

Financial literacy denotes investor's knowledge and its application for optimizing financial investment decisions (Hogarth, 2002; Kaur; 2016). It can be taken as investment knowledge to help increase his wealth (Andrew and Linawati, 2014; Gupta et. al., 2017). Financial literacy is the competence of using information for investing (Warsono, 2010). Financial literacy as highlighted by Khan et. al., (2015) helps investors to manage debt, resort to effective financial planning, and understand the real

worth of money (Singh and Sharma, 2016). Financial literacy is the capability to take investment decisions on the basis of knowledge about the investment instruments, investment prospects, and markets (Johnson et al. , 2016). Understanding of money and financial investment products, according to Zait and Berteau (2014) can help one make good decisions on finances. People use knowledge to plan, invest, save, and budget (Hogarth, 2011). Jose et al., 2012 associated financial literacy with reading ability, understanding, analyzing and managing financial documents along with effective communication. Financial literacy is the ability to properly determine investment choices, currency discussion, and investment issues with ease. It is also associated with proper planning for future, and easy handling of financial challenges. Dvouletý (2020) found that most of the economically active women struggle from financial insecurity, stress, risk, however the reasons differ across age. Financial literacy programs differ across age, gender, income etc. (Hood et. al., 2014). Chen and Volpe (1998) associate low levels of financial literacy with college students.

Refera et al.(2016) found fifty percent of respondents in their sample possessed high levels of financially literacy. They also found that there were important differences across gender, age, education level, nature of the job, and income. Bhushan and Medury (2013) concluded that in India salaried investors possessed higher financial literacy. However researchers couldn't find link of financial literacy with age and geographical location. The results varied across countries and across various demographic factors too.

In the present research financial literacy has three components viz., financial behavior, financial attitude, and financial knowledge (Janor et. al. 2016). This is also supported by other researchers' (Nababan and Sadalia, 2012; Hogarth, 2002; Schagen and Lines, 1996; Servon and Kaestner, 2008; Moore, 2003).

- *Financial Behaviour*

Financial behavior covers the ability to manage expenditure namely, pay bills on a time, manage savings and borrowing. It enables individuals to choose investment tools

and financial products (Janor et. al., 2016) and helps in improving investment decision making.

Financial behavior helps people to use information to make informed investment decisions. Financial behaviour, an important element of behavioural finance helps in understanding how people use information to take investment decisions. (Aminatuzzahra, 2014).

- *Financial Attitude*

Robb and Woodyard, (2011) found that attitude of a retail investor influences his decision making. Financial attitude deals with feelings about individual financial difficulties, as measured by reactions to a statement or opinion (Marsh, 2006).

- *Financial Knowledge*

Financial knowledge means that individuals have knowledge of all aspects assisting in financial decision making. A knowledge with respect to risk and return, inflation, option choices etc. (Janor et. al., 2016). Financial knowledge helps tackle financial problems and provide solutions (Marsh, 2006). However according to Hathaway and Khatiwada (2008), it is not essential that financial knowledge will always lead to better investment decisions. They opined that the relationship between investments and financial knowledge has not been not been well established Schwab et al., (2008) associates financial literacy with the skill to effectively deal with retail investment decisions to induce financial security.

Financial literacy is a matter of concern of most economies of the world (Bhushan, 2014; Fazal (2017). Financial literacy helps to maximize life utility through the distribution of financial funds (Shaari, Hasan, Ramesh, and Mior, 2013). As retail investors become more educated, their willingness to take risk increases and helps in achieving success (Weinstein 2014). Financial literacy as highlighted by Kevin (2014) is equally applicable to real estate investors. Financial literacy helps to optimize investment and tackle adverse market situations. Financial literacy is generating awareness to choose financial products for optimizing returns. The advent of new and

innovative financial products demand higher levels of financial literacy (Reserve bank of India, 2008).

Banking professionals and financial advisors possess high levels of financial literacy and have skills in jughing financial products (Al-Tamimi et.al., 2009). Financial literacy assists to provide independence from predatory lenders, to save them from exorbitant interest rates charged for borrowing (Karsidi et al., 2015). Financial literacy and risk awareness influences investment decisions. Majority of middle-class retail investors favour buying from a new issue market in comparison to buying from secondary market (Gupta, 1991). If retail investors' are having low levels of financial literacy, they choose to invest in bank deposits and foreign currency. Financial literacy (Seay. et.al.,2016) helps to build a diversified portfolio (Calcagno et.al., 2015; Aren and Aydemir, 2016). Perception based investments are also visible (Anderson et.al, 2017). These investors don't seek financial advice. Thus, without having the basic knowledge of financial information and due to lack of financial literacy they cannot diversify their portfolios. High level of financial literacy enables them to be active in the financial market and carefully plan their investment (Fedorova et.al., 2015; Van Rooij et al., 2011). Literate investors take every investment decision after discussion with family members and financial advisors (Lin et.al. 2017).

Financial literacy helps investors to evade undisciplined investment decisions (Takeda et.al., 2013). Financial literacy motivates retail investors' to invest in derivatives and increase interest in the financial market. It helps to lower the barricades to purchase complex derivatives products (Hsiao et. al., 2018). Financial websites provide a wide variety of financial information that affects individual investors' behaviour at the time of investment decisions (Lee et.al, 2008). Financial literacy can provide much support in investment decision making.

Chijwani (2014) revealed that financial literacy levels of females were low. Potrich et.al. (2017) also supporting this indicating that men had more risk-bearing capacity higher literacy levels. Arena et.al. (2016) highlighted that unmarried women are more risk-friendly. Thus, it is not only gender but marital status may also influences

investors' decisions. Investors with high level of financial knowledge can get abnormal returns on their investment. Education, gender, trading experience, age, and portfolio value are the other factors influencing investment behavior.

Pradita et.al.(2019) found that the levels of financial literacy of investors is always beneficial in investment decisions. It has equal relevance for high and low income investors (Hassan *et al.*, 2018). There are other researcher supporting the positive relation of financial literacy with investment decisions (Choi et al., 2011; Hilgert et al., 2003). Assefa et.al.(2018) people with low level of financial literacy invested mostly in banks, government bonds, and pension funds. Salaried investors in Ethiopia invested in interest-free investment alternatives, traditional investment, and never invested in risky instruments. Religious reasons were the least affecting factor in investment decisions (Al-Tamimi, 2009). These factors are challenging for all investors' (Awais *et. al.*, 2016). Contribution of financial literacy not only helps in investment decisions but also assists individuals to safeguard themselves from shockwaves (Klapper, 2013). Financially illiterate investors' face many specific losses, including extreme borrowing charges and costs (Hastings et al., 2011; Lusardi and Tufano, 2015). They were unable to make choices for investing in long-term financial instruments (Van Rooij et al., 2011; Yoong, 2011).

Researchers (Abdeldayem, 2016; Bhushan, 2014; Chaturvedi and Khare, 2012) associate low financial literacy with investment in traditional and risk-free investment products. Panos (2011) linked high financial literacy with retirement planning. Abdeldayem (2016) found the relationship between investment decisions and financial knowledge in the Bahrain market. He concluded that majority of retail investors had less literacy and men possessed more levels of financial literacy than women. Cooper et al. (2014) opined that investors with high levels literacy invested in risky investment. Gambetti and Giusberti (2012) supported that investment experience significantly helped in predicting investment decisions.

Real estate is one of the financial alternatives and buying a home is an important but difficult decision. Investing in real estate is a challenging and complex financial

decisions for people with low levels of financial literacy. They are not capable to estimating the loan period, and interest etc. This is a barrier for less sophisticated households in becoming homeowners (Gathergood 2017). Thus, literacy plays an important role in investing in real estate too.

According to Remund (2010), financial literacy relates to investors having the ability for managing money. It encompasses examine, manage, the capability to read, and connect individual financial conditions that impact on material security (Johnson and Sherraden, 2007). A brief knowledge is not a solution, there is depth needed (Mihalcova *et al.*, 2014). Hence there is a need to examine financial literacy and also to examine how it influences on investment decisions.

Financial literacy helps in optimizing financial decisions. It requires significant understanding of the procedures, functions, expenditure, and financial facilities. This is important for retail investors (Johnson and Sherraden, 2007). Financial literacy helps people in money management to optimise investment for higher returns (Pellinen *et al.*, 2011). Higgins (1997) found that research on decision-making process revealed that investment decision was shown by investors' investment objectives. Financial literacy protects investors against potential mistakes in investment decisions (Pham and Avnet, 2004).

The relation between financial literacy and investment decision has been examined by many researchers (Nurul Afiqah Ahmad Sabri, 2016; Margit Amos Akims and Ambrose Jagongo, 2017). Educated and experienced investors were less prone to critical shortcuts (Khan, Naz, Qureshi and Ghafoor (2017). The outcome suggests that financial literacy allowed them to act with caution.

There are numerous studies reporting a positive effect of financial literacy on market contribution, personal savings, debt and retirement planning, (Clark *et. al.*, (2012) Duca and Kumar, 2014; Jappelli and Padula, 2013; Norvilitis *et al.*, 2006; Stango and Zinman, 2009; Van Rooij *et al.*, 2011; Xiao *et al.*, 2012). Ramachandran *et.al.* (2011) also suggested that retail investors who invested in equity could improve their

investment decision-making by getting more financial knowledge and information about decision stimulating variables.

Oteng (2019) reported that financial traders possessing low levels of financial literacy lacked of investment knowledge. Vosner, Saranto, Rissanen, and Bobek (2013) revealed that investors informed knowledge in the use of Information Communication Technology (ICT), online social networks subsequently had impact on the quality of life of people. A technology up-to-date investor will take better investment decisions. If investors invest with a long-term perspective and maintain a strategy, it will result in diversification as well as enhancement of sovereign wealth funds (Jerome et. al., 2016). Thus, these studies highlight the importance of financial literacy for decision making.

However, the more one reads literature on financial literacy and its effect on investment decisions, the more one is inclined to examine this factor in further detail. This was primarily the reason of investigating the importance of financial literacy on decision making. There is need to throw more light by investigating the relation of financial literacy with investment decisions. Financial literacy scale items are presented in Table 2.4.

The current study plans to examine its role as mediating factor between behavioural factors and investment decisions. The related hypothesis is:

H4: There is a relation between behavioural factors and investment decisions and the relation is strengthened with financial literacy as mediator.

The current study is undertaken to examine the role of financial literacy as a mediating factor between socio-economic factors and investment decisions. The related hypothesis is:

H5: There is a relation between social factors and investment decisions and the relation is strengthened with financial literacy as mediator.

Table 2.4: Author-wise index of Financial Literacy

Financial Literacy (FL)	Authors (Year)
Capable of handling financial future (e.g. Buying insurance or investments).	Worthington (2006),
A high-risk and high-return investment strategy.	Agarwal, Amromin et. al.,(2015),
Finances are a significant source of worry or "hassle".	Panos (2013),
Control of financial situation.	Almenberg (2015)
You are able to avoid being victimized by financial scams.	Van Rooij, Lusardi & Alessie (2011)
You buy the right kind of insurance to protect myself from catastrophic risk.	Klapper, Lusardi & Lusardi (2013)
A financially secure life through forming healthy spending habits.	Cutler (2013),
Maintain adequate financial records.	Mandell, L., & Klein (2009)
Keeping records of income and expenditures.	Almenberg (2015)
Buy insurance products for investment.	Jappelli & Padula (2013)
Sufficient information regarding investment alternatives.	Cutler (2013),
Investment alternatives help in tax planning.	Asaad (2015),
According to bullish and bearish trends investor reacts in the market by purchasing or selling.	Faulkner (2015),
The ability to judge the market trends while investing in stock market.	Musundi (2014),

Source: Authors compilation

2.5 Concluding Remarks

This chapter focuses on earlier literature related with behavioural factors, socio economic factors and financial literacy influencing investment decisions. Studies carried out around the world have wide variations in results. In this chapter the factors influencing financial literacy and investment decisions have been identified and their relation will be examined in chapter IV. Thus, through this chapter, there the details of behavioural factors, socio-economic factors, financial literacy and investment decisions scale have been provided. This chapter also lays the foundation for further analysis.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

After completing the literature review and hypotheses development, the stage has been set to explain the research design and methodology. This chapter covers the objectives of the study. It provides insight into the research design, which includes sampling details, selection of sample and survey areas. Further this chapter includes sampling plan along with methods undertaken for collection of data and the selection of statistical techniques for interpretation of data.

Section 3.1 deals with the objectives of the research, section 3.2 describes the research methodology, covering the research design and data collection. In Section 3.3 tools and techniques used in present study are provided. Further this section also explains the descriptive statistics, discriminant validity and structural equation modeling (SEM) technique used for analysis. Section 3.4 discusses validity and reliability of the questionnaire. Finally in section 3.5, the conceptual model had been represented.

3.1 Objectives of the study

The present research has been undertaken with the following objectives:

- O1:** To investigate the financial product preference of the respondents.
- O2:** To analyse the factors influencing investors' behaviour.
- O3:** To examine the relation between risk-bearing capacity and investment decisions.
- O4:** To examine the relation between financial literacy and investment decisions.
- O5:** To design a model relating to retail investor behaviour and investment decisions.

3.2 Research Methodology

Research methodology outline details of methods used for analysis. This current research is based on primary data using a structured questionnaire. This section describes the details of the research design, sample size, research tool, and its validity and reliability.

3.2.1 Research Design

This study is based on descriptive design. The behavioural factors, socio-economic factors and financial literacy are the predictor variables. Investment decision is the dependent variable. The study uses a structured questionnaire. Data Collection were done with the help of brokerage firm's executives and managers.

3.2.2 Data collection

The sample has been drawn from Punjab, Himachal Pradesh, and Haryana, three states representing North India. These three states are important states of North India. Many items of the scale have been adopted from different research papers, mentioning a few prominent ones (Islamoglu et. al., 2015; Ranganathan 2006; Al-Tamimi 2009; Chijwani 2014). These items were modified to achieve the objectives. The structured questionnaire was piloted by twenty academicians and ten practitioners. The advice of experts helped in refining the questionnaire. Some questions were modified to make them simple and understandable. Likert scale with 1 relating with strongly disagree and 5 with strongly agree has been used.

The questionnaire has four segments. The first section covers the demographic aspects, the second section focuses on financial literacy; the third segment covers the behavioural and socio-economic factors, and the last one deals with investment decisions. There are 83 items in the questionnaire, 14 are related to demographic aspects. The scale of financial literacy has 14 items. There are 26 items for behavioural factors scale and 15 items for socio-economic factors scale. Investment decisions scale has 11 items. The questionnaires were filled by retail investors'. Help was taken brokerage firms to get the list of retail investors. Executive managers of these firms

distributed the questionnaires, which were then used for analysis. The details of the survey instrument are provided through table 3.1.

Table 3.1. Information on Questionnaire

Sr. No.	Gist of Questions	Measurements	Basic Objective
1	Name		Data Identification
2	Contact no		Data Identification
3	Location		Demographic Details
4	Gender		Demographic Details
5	Age		Demographic Details
6	Marital status		Demographic Details
7	Educational status		Demographic Details
8	Occupation		Demographic Details
9	Designation		Demographic Details
10	Organization		Demographic Details
11	Annual income		Demographic Details
12	Save annually		Demographic Details
13	De-mat a/c		Demographic Details
14	Financial advisor		
15	Information related to investment	5-point Likert Scale	
16	Objectives of savings	5-point Likert Scale	
17	Preference of Investment	5-point Likert Scale	
18.1	Behavioural Factors Influencing Retail Investors Investment Decisions Herding Factors (Questions 1-4) Overconfidence (Questions 1-4) Ability Bias (Questions 1-3) Endowment bias (Questions 1-2) Loss Aversion (Questions 1-5)	5-point Likert Scale	Behavioural Factors

	Regret Bias (Questions 1-4) Mental Accounting (Questions 1-4)		
18.2	Market, Firm and Social Factors Influencing Retail Investors Investment Decisions Market (Questions 1-4) Firm (Questions 1-6) Social Factors (Questions 1-5)	5-point Likert Scale	Socio-Economic Factors
19.1	Knowledge level of Investors Financial Literacy (Questions 1-14)	5-point Likert Scale	Financial Literacy
19.2	Investment decision Returns (Questions 1-4) Risk (Questions 1-4) Prior Information (Questions 1-3)	5-point Likert Scale	Investment decision

Source: Authors compilation

3.3 Tools and Techniques

Statistical package for social sciences (SPSS) along with analysis of moment structures (AMOS 20) have been used for analysing the data. SPSS was mainly used to do descriptive analysis, to check reliability of different constructs and investigate relation among the different latent variables. Descriptive statistics have been applied. Correlation analyses were applied for relationships among independent variables and also among dependent and independent variables. AMOS 20 has been used to design the model using structural equation modeling (SEM). Goodness of fit indices were employed to check the model fit. These details are provided below:

3.3.1 Descriptive Statistics

Descriptive statistics applied in the current research are mean and standard deviation. These have been used for ranking product preferences and sources of information access. Respondents' personal information have also been analyzed using simple percentage and bar diagrams.

3.3.2 Discriminant Validity

Discriminant validity suggests that theoretically constructs are different and measures of constructs are not highly correlated (Campbell and Fiske, 1959). Discriminant validity has been established by exploring the correlation between the various constructs of the study like herding factors, overconfidence, loss aversion, ability bias, endowment bias, regret bias, mental accounting, market, firm, social factors, risk, return, and prior information. Using the correlation matrix, it was established that the constructs are distinct from each other.

3.3.3 Structural Equation Modeling (SEM)

Structural Equation Modeling (SEM), a multivariate analysis technique has been applied to describe relations to test a conceptual or a theoretical model. Application of SEM in the present study helped to investigate the influence of the relation among behavioural factors, socio-economic factors and investment decisions. The final designed model has financial literacy as a mediating variable. This has been done using AMOS 20. The goodness of fit indices for every construct have been calculated to confirm whether they are above the given threshold levels.

3.4 Validity and Reliability

Cronbach's alpha has been computed for all constructs for checking reliability and validity. This is represented in Table 3. Cronbach's alpha processes the internal consistency of survey instrument (Nunnally, 1978; Hair et al., 1995). Reliability and validity are checked of all exogenous and endogenous variables viz., behavioural factors (BF); financial Literacy; socio-economic factors (SEF), and investment

decisions (ID). Validation through experts was done as reported earlier. In the present study, the internal consistency of all factors is greater than 0.70 and is thus, in the acceptable range.

Table 3.2. Data Reliability

Variables	Items included in Variables	Item Code	Cronbach Alpha
Behavioural Factors	i. Herding Factors ii. Overconfidence iii. Ability Bias iv. Endowment bias v. Loss Aversion vi. Regret Bias vii. Mental Accounting viii. Personal Factor	HF O AB EB LA RB MA PF	0.818
Socio-Economic Factors	i. Market ii. Firm iii. Social Factors	M F S	0.689
Investment Decision	i. Risk ii. Return iii. Prior Information	RI RE PI	0.827

Source: Authors compilation

3.5 Conceptual Research Model

A conceptual model represents the details of research undertaken to achieve the defined objectives. The conceptual represents the relation of behavioural factors and socio-economic factors to examine their influence on investment decisions. The study has used financial literacy as a mediating variable between behavioural factors, socio economic factors and investment decisions. The purpose was to determine whether the relation between behavioural factors and investment decisions improved with financial

literacy. It was also to determine if the relation between socio-economic factors and investment decisions improved with mediation effect of financial literacy.

Majority of the research on retail investors' behavior in investment decision making in India has been conducted in a different geographical regions. These studies were carried out taking into account the different aspects excluding the variables chosen in the present study (Hedau 2019; Syed 2010; Kanojia et al., 2018; Chandra, 2008; Mallick 2015; Geetha 2012; Devadas 2019). Thus, keeping these limitations of earlier studies, the present research include the diverse dimensions namely, the effect of behavioural factors on investment decision, the influence of socio-economic factors on investment decision, and whether financial literacy mediates and improves the relation. We intended to examine whether the behavioural factors, socio-economic factors, and financial literacy significantly influenced investment decisions. Financial literacy may play a vital role in influencing behavioural and socio-economic factors to improve investment decisions. Hence it becomes pertinent to examine its role as a mediating factor.

Behavioural factor is comprised of personal factors (PF), herding factors (HF), overconfidence (O), ability bias (AB), loss aversion (LA), regret bias (RB), endowment bias and mental accounting (MA) respectively. The details are provided in the previous chapter. Socio-economic factors are related to; i) market (M); ii) firm (F) and iii) society (S). The investment decision scale is the dependent variable and is comprised i) prior information (PI), ii) risk (RI), and iii) returns (RE). The construct-wise details of items have been presented in the preceding chapter. The details of all the constructs are shown in Table 3.3.

Table 3.3 Details of Behavioural Factors, Socio-Economic Factors, Financial Literacy and Investment Decision

Constructs	Items code	Items
Behavioural Factors (BF)	RB	Regret Bias
	LA	Loss Aversion

	AB	Ability Bias
	PF	Personal Factor
	O	Overconfidence
	HF	Herding Factor
	MA	Mental Accounting
Socio-Economic Factors (SEF)	S	Social
	F	Firm
	M	Market
Financial Literacy	FL	Financial Literacy
Investment Decision (ID)	RI	Risk
	RE	Return
	PI	Prior Information

The proposed research model is projected through Figure 3.1.

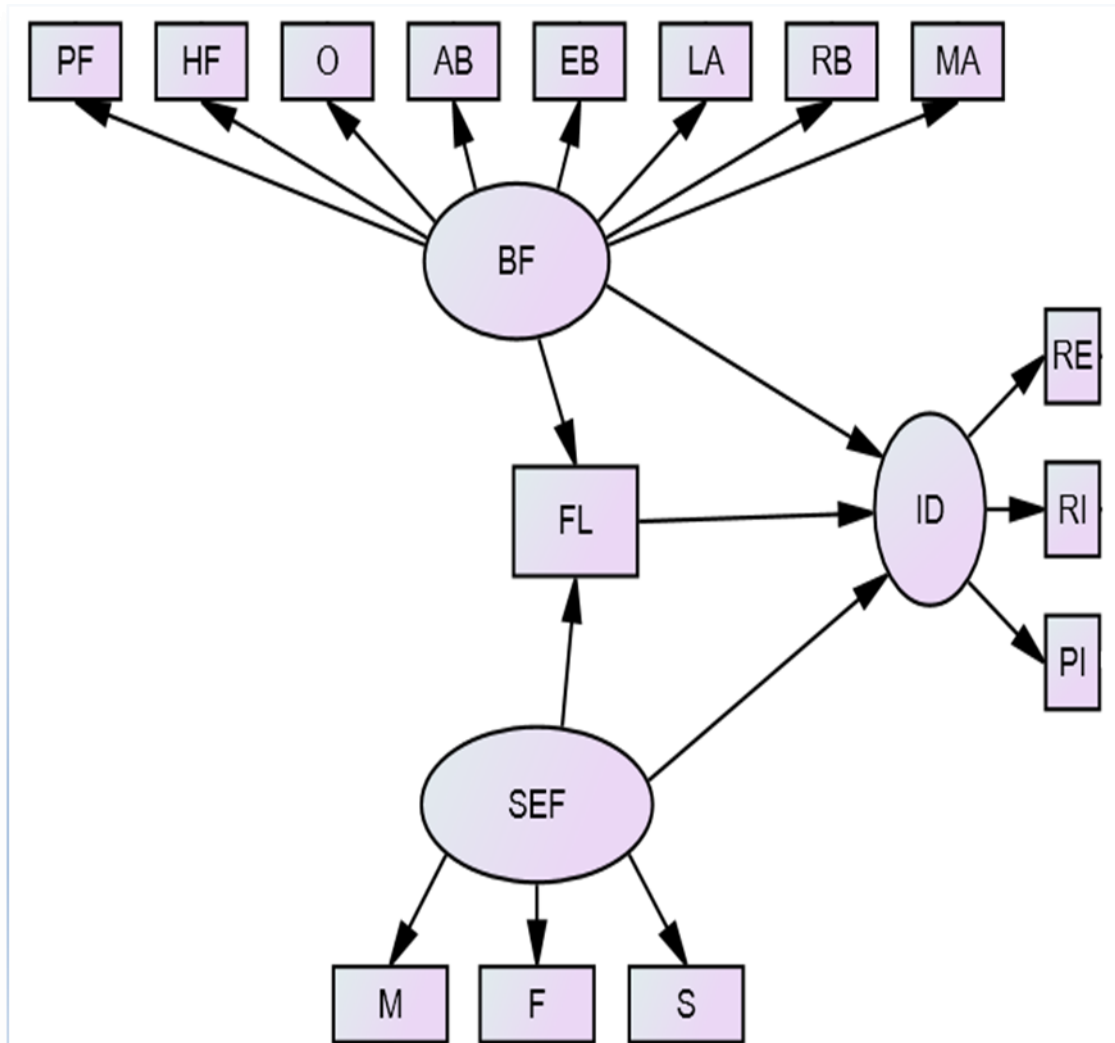


Figure 3.1. Proposed Research Model

3.6 Concluding remarks

The chapter explains the details of data collection from retail investors' of three north Indian states namely, Punjab, Haryana, and Himachal Pradesh. This chapter provides the research design and methodology adopted for the present study. It explains the questionnaire designing, sources of data collection, and the details of reliability and validity. Further, this chapter provides information about the tools, and techniques used to analyze data and develop the model. The interpretation of data is discussed in the Chapter 4.

CHAPTER 4

DATA ANALYSIS AND INTERPRETATION

This chapter covers the detailed investigation for interpretations of the data. The findings focus on retail investors' behavior in investment decisions. The study analysed the relation between behavioural factors and investment decisions; between socio-economic factors and investment decisions, and also examined the mediating role of financial literacy.

Section 4.1 provides the details of the demographic profile of retail investors' so that the nature of the respondents can be understood and section 4.2 covers the characteristics of respondents. Section 4.3 presents the analysis of retail investors' behaviour or discusses the behavioural factors, socio-economic factors, financial literacy, and investment decisions. Finally, section 4.4 covers the concluding remarks.

The study is based on data collected through retail investors from North India from 600 respondents. North India can be taken to represent India. A list of investors were obtained from the brokerage firms. Executives and managers of these firms were requested to distribute the questionnaires. In all, 650 questionnaires were distributed to investors, out of which 600 filled questionnaires were received where 182 respondents were women respondents and 418 respondents were men. To enhance representativeness of the population, the sample population was drawn from both the genders. In terms of educational qualification graduates as well as post graduates were included. Effort was made to include people from all age groups with diverse educational qualifications. There were many revisits to augment partaking of these persons in the sample. Moreover, the sample has wider proportion of males than females as in India more males than females are into retail investment, but the sample represents the percentage as reported by earlier researchers'. Thus, the sample is representative sample. This has been represented through demographic profile as explained in section 4.1.

4.1 Demographic profile of respondents

This section covers the demographic profile of retail investors.

4.1.1 Status of Location

Data were collected from three North Indian states, Punjab, Himachal Pradesh, and Haryana. Out of 600 respondents, 29.5 % of respondents are from Punjab, 37.5% from Himachal Pradesh, and 33 % from Haryana. Table and figure 4.1.1 represents the same.

Table 4.1.1. Status of Location

Location of respondents (n=600)	Number	Percentage
Punjab	177	29.5
Haryana	198	33
Himachal Pradesh	225	37.5

Source: Authors compilation

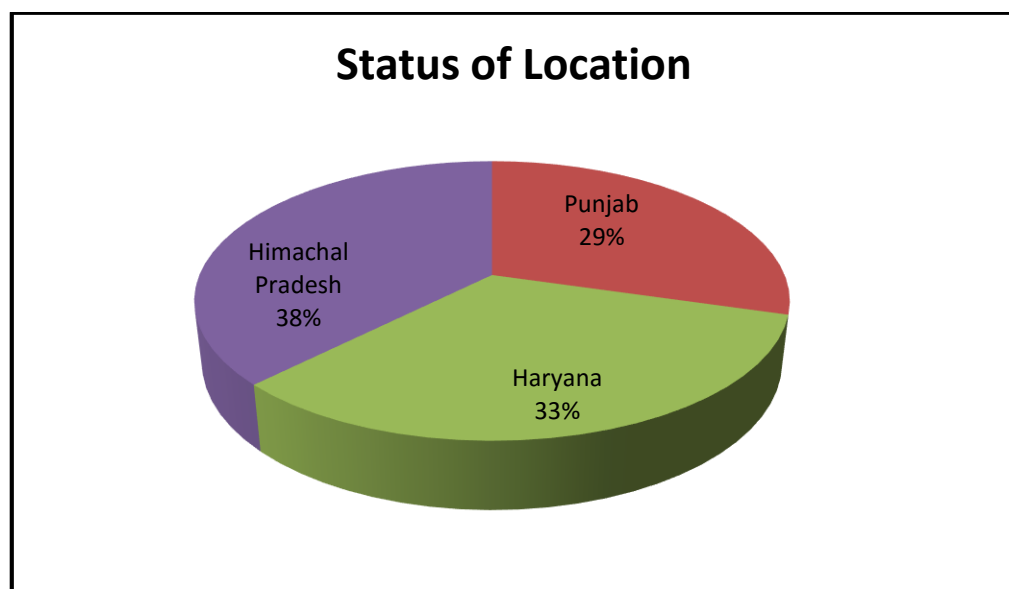


Figure 4.1.1. Status of Location

4.1.2 Gender Profile

The sample of male respondents is more than female respondents. As shown through table 4.1.2 and figure 4.1.2 represents that 69.7% male and 30.3% female respondents in this study.

Table 4.1.2. Gender Profile

Gender (n=600)	Number	Percentage
Male	418	69.7
Female	182	30.3

Source: Authors compilation

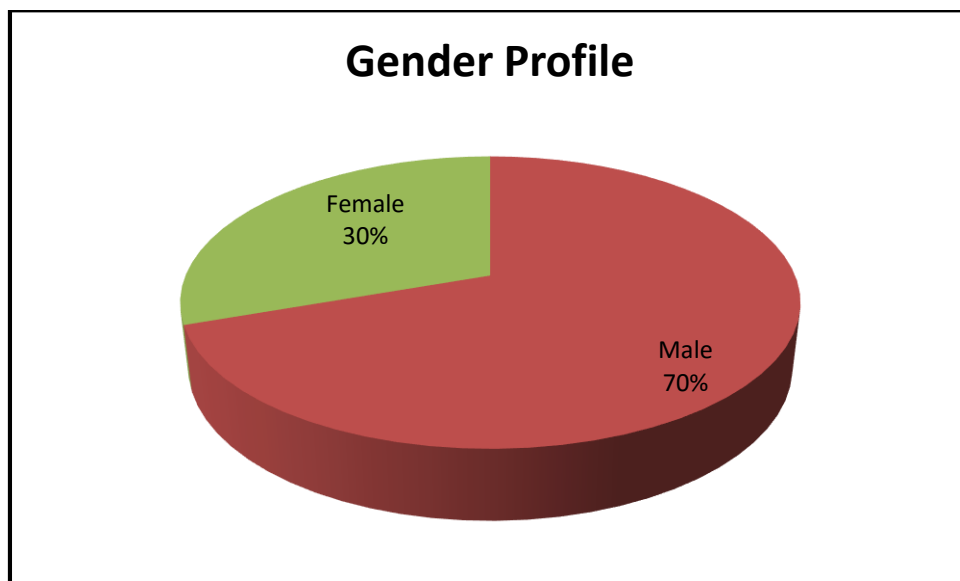


Figure 4.1.2. Gender of respondents

4.1.3 Age Profile

As through this table 4.1.3 and figure 4.1.3 age of retail investors is dividing into three groups. These groups are: 25-35, 35-45, and 45 and above. 63.8% of respondents are in 25-35 years age group, 26.8% in 35-45years and only 9.3% are in the age group of 45 & above.

Table 4.1.3. Age Profile

Age Profile (n=600)	Number	Percentage
25- 35	383	63.8
35-45	161	26.8
45 and above	56	9.3

Source: Authors compilation

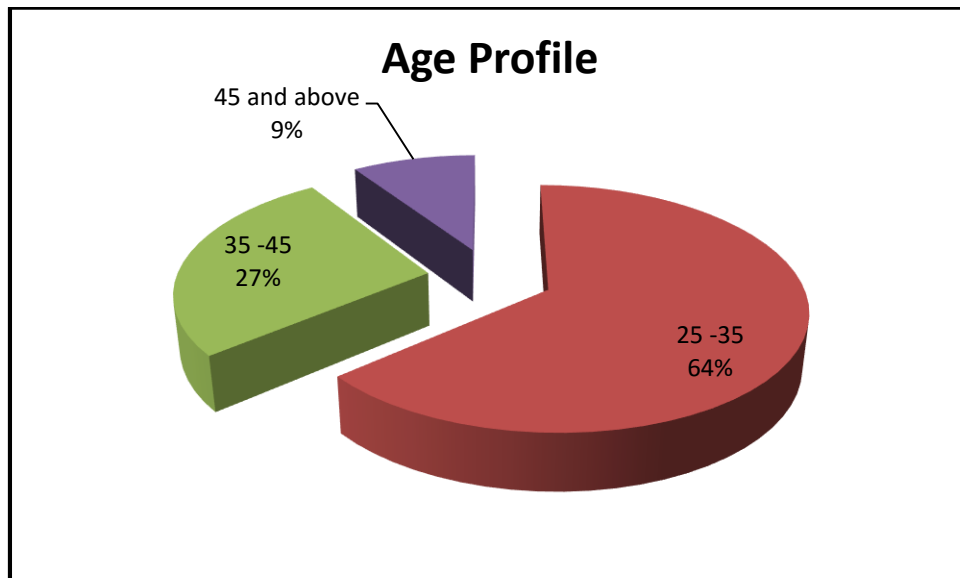


Figure 4.1.3. Age Profile

4.1.4 Marital Status

Out of 600 retail investors' 379 people are married and 221 are single. Married 63.2 percent and 36.8 percent single. Table and figure 4.1.4 represents the same.

Table 4.1.4. Marital Status

Marital status (n=600)	Number	Percentage
Married	379	63.2
Single	221	36.8

Source: Authors compilation

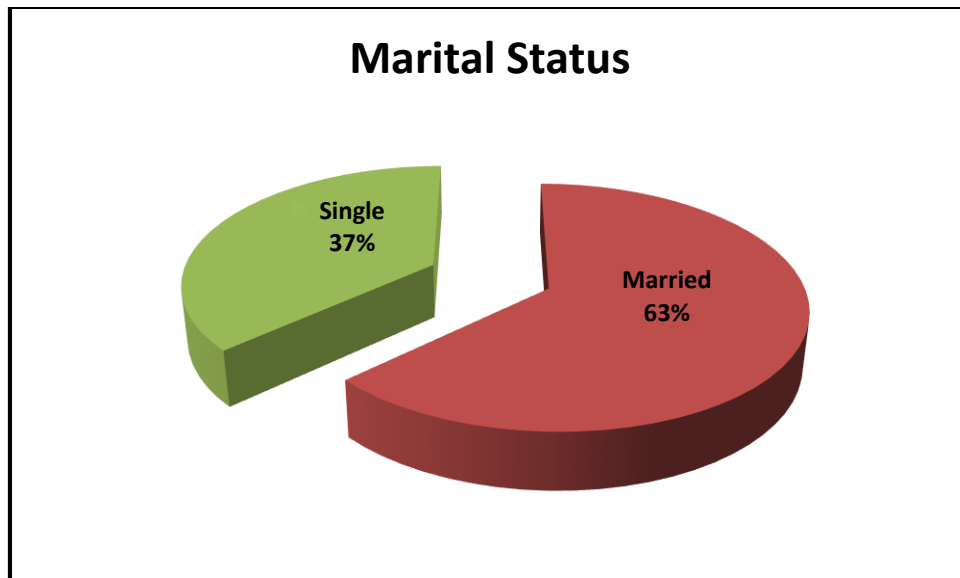


Figure 4.1.4. Marital status of respondents

4.1.5 Educational Status

The educational status of respondents represents three levels. These are: Matriculates Undergraduates and Postgraduates. The sample is dominated by postgraduates (63.3%). Graduates constitute 18.7% and the remaining 18% are matriculates. Table and Figure 4.1.5 represents the educational status.

Table 4.1.5. Educational Status

Educational Status (n=600)	Number	Percentage
Matriculate	108	18
Undergraduate	112	18.7
Postgraduate	380	63.3

Source: Authors compilation

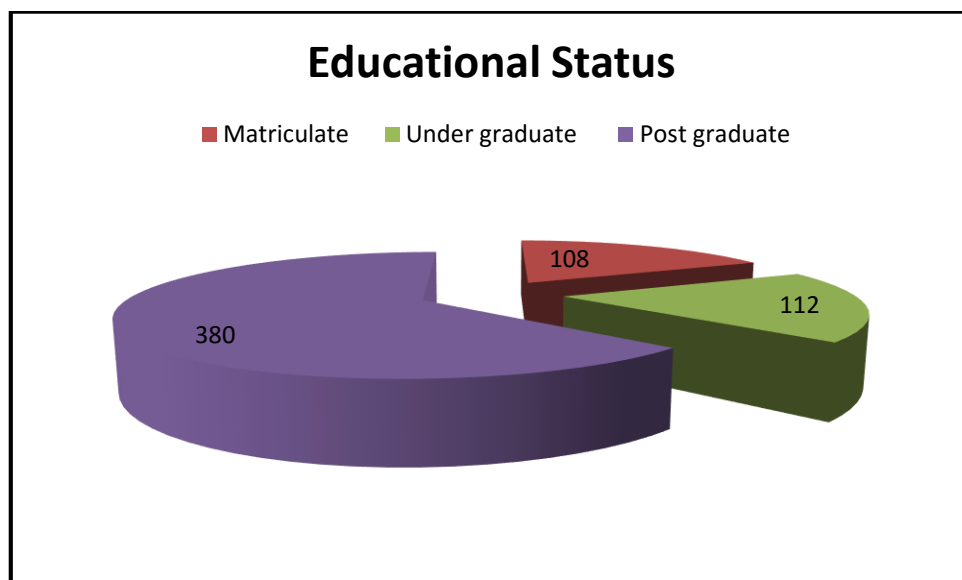


Figure 4.1.5. Educational status of respondents

4.1.6 Occupation of respondents

Through table 4.1.6 and figure, 4.1.6 occupation of the respondent is represented. This has been classified in two groups, Business and Salaried class. In this study, 90.5 percent of respondents are salaried persons only 9.5 percent of people are business persons.

Table 4.1.6. Occupation of respondents

Occupation of Respondents (n=600)	Number	Percentage
Business	57	9.5
Salaried	543	90.5

Source: Authors compilation

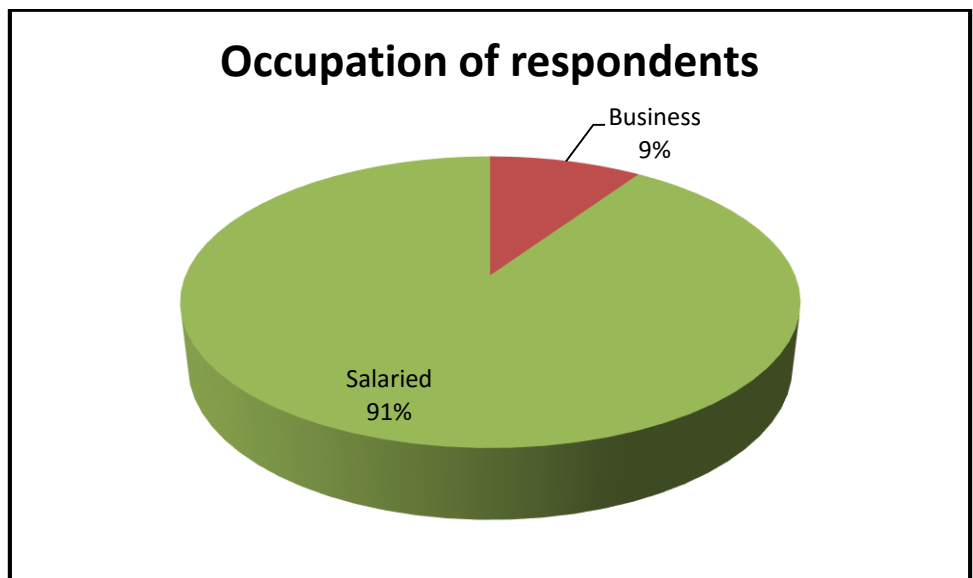


Figure 4.1.6. Occupation of respondents

4.1.7 Sector of respondents

Three types of sectors are chosen for the survey, viz. government, private and other. Table 4.1.7 and figure 4.1.7 are shown as the majority of the sector of respondents is the private sector than the other and last government sector. The private-sector respondents' percentages are 55.7, others are 37.5, and only 6.8 percent of respondents from the government sector.

Table 4.1.7. Sector of Respondents

Sector of respondents (n=600)	Number	Percentage
Govt.	41	6.8
Private	334	55.7
Other	225	37.5

Source: Authors compilation

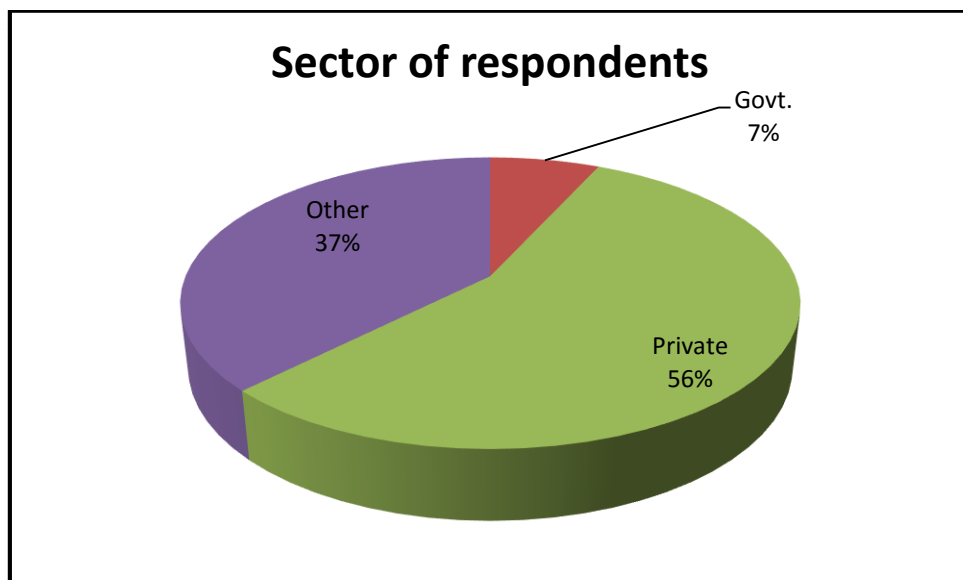


Figure 4.1.7. Sector of respondents

4.1. 8 Annual Income of Respondents

Amongst the three categories of the annual income of respondents, Rs 5,00,000 – 10,00,000 group dominated (84.5 percent); followed by below Rs 5, 00,000 group (12.3 percent), and the last group, i.e., above 10, 00,000 group had only 3.2 percent responses. This has been depicted through Table and Figure 4.1.8.

Table 4.1.8. Annual Income of respondents

Annual Income of respondents (n=600)	Number	Percentage
Below Rs 5,00, 000	74	12.3
Rs5,00,000 - 10,00,000	507	84.5
Above 10,00,000	19	3.2

Source: Authors compilation

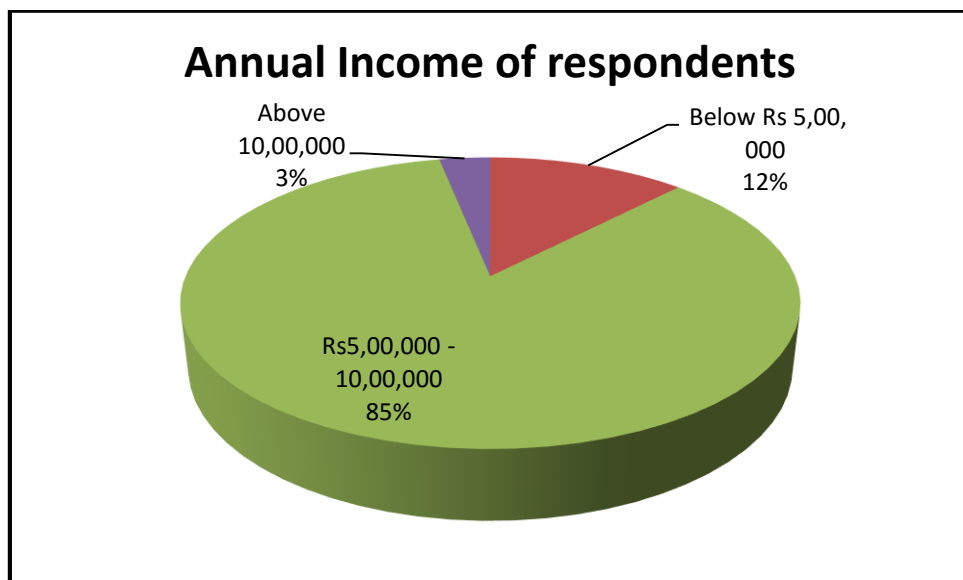


Figure 4.1.8. Annual Income of respondents

4.1.9 Annual saving of respondents

As per the annual income of respondents, annual savings are classified into three categories. These categories are: below Rs. 1,50,000; Rs.1,50,000 to 3,00,000 and; More than Rs. 3,00,000. Table 4.1.9 and figure 4.1.9 shows that annual savings of retail investors; below Rs. 1,50,000 group dominated (48.33 percent) in the sample; followed by Rs.1,50,000 to 3,00,000 group (40.33 percent) and the last category with more than Rs. 3,00,000 group had only 11.33 percent respondents.

Table 4.1.9. Annual savings of respondents

Annually saving respondents (n=600)	Number	Percentage
Below Rs. 1,50,000	290	48.33
Rs.1,50,000 to 3,00,000	242	40.33
More than Rs. 3,00,000	68	11.33

Source: Authors compilation

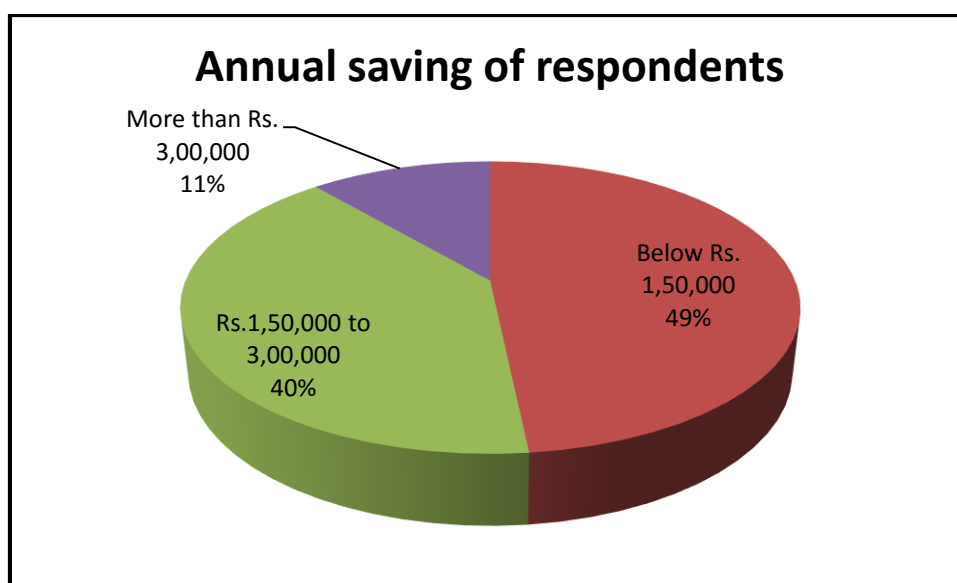


Figure 4.1.9. Save annually of respondents

4.1.10 De-mat a/c of respondents

Out of 600 respondents, only 50.8 percent of people have a De-mat account. All most 50 percent of respondents were not using the De-mat account. In other words, only 50 percent of people investing in the capital market or share market. Table and Figure 4.1.10 represents this.

Table 4.1.10. De-mat a/c of respondents

De-mat a/c of respondents (n=600)	Number	Percentage
Yes	305	50.8
No	295	49.2

Source: Authors compilation

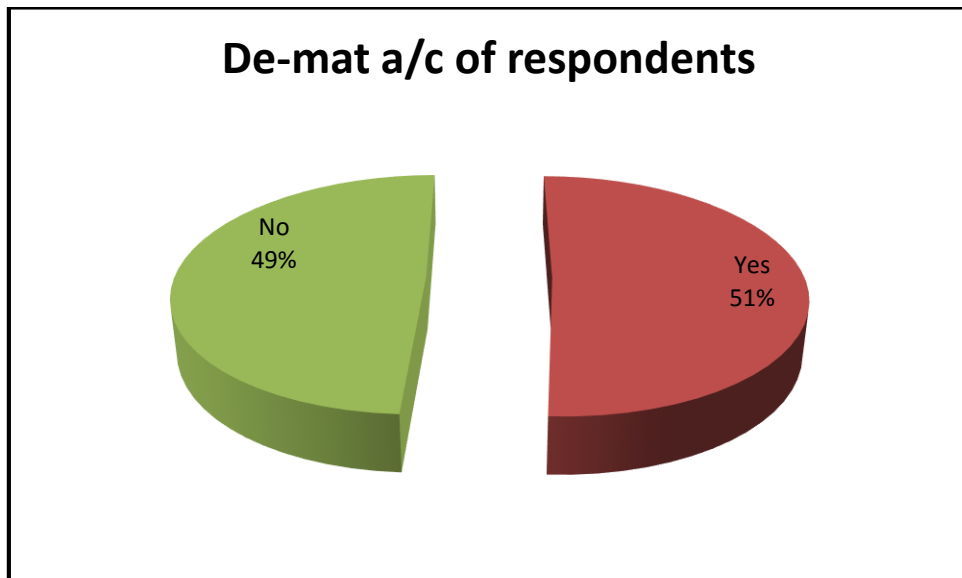


Figure 4.1.10. De-mat a/c of respondents

4.1.11 Financial Advisor Status

As per this study in table 4.1.11 and figure 4.1.11, 245 (40.8) percent of respondents invested their savings with the help of financial advisor, and 355 (60%) retail investors resorted to investing on their own relying on their knowledge and perception without seeking advice from financial advisors.

Table 4.1.11. Financial Advisor Status

Financial advisor of respondents (n=600)	Number	Percentage
Yes	245	40.8
No	355	59.2

Source: Authors compilation

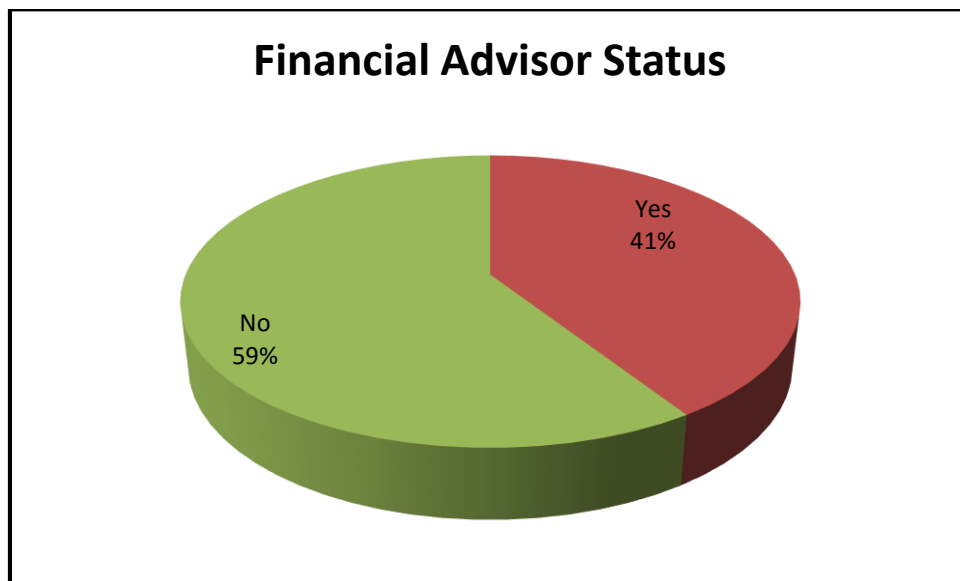


Figure 4.1.11. Financial Advisor Status

After representing the demographic profile of respondents, it was important to focus on Characteristics of retail investors’.

4.2 Characteristics of respondents

This section describes the important characteristics related to information access and Objectives of savings.

4.2.1. Information Access for Investment Decisions

Retail investors access investment information through newspapers, channels, family/friends/colleagues, internet, magazines & periodicals, and advisors and finance planners. Table 4.2.1 shows the ranking of the information related to investment given by the respondents based on mean and standard deviation. The responses have been rated through a survey instrument on a scale of 1-5. With 1 relating with strongly disagree and 5 with strongly agree.

Table 4.2.1. Information Access for Investment Decisions

Sr. No.	Items	Mean	Std. Deviation	Rank
1.	Newspaper	1.89	0.64	6
2.	News Channels	2.46	1.34	5
3.	Family/Friends/ Colleagues	2.72	1.21	4
4.	Internet	3.21	1.26	1
5.	Magazines & Periodicals	3.2	1.37	2
6.	Advisors/Financial Planners	2.66	1.28	3
Average		2.69	1.18	

Source: Authors compilation

The results shown in the table 4.2.1 highlighted which source of information is more important for investment decision. Internet is the main source of investment information for investors, having the highest average (3.21) and standard deviation (1.26). The retail investor's second and third useful source of information access are: Magazines & Periodicals and Advisors/Financial Planners with the mean value is 3.2

& 2.66. The Newspaper is not emerging as an important access source. May be in this internet savvy environment has endued investors to rely more on this source.

4.2.2. Objectives of Savings

There are seven types of objectives of savings of retail investors, as depicted through table 4.2.2. These objectives of savings of respondents are for retirement purposes, tax saving, paying insurance premiums, children’s education, buying a home, marriage, and holiday vacations.

Table 4.2.2. Objectives of savings

Sr. No	Items	Mean	Std. Deviation	Rank
1.	For Retirement purpose	2.85	1.48	6
2.	For tax saving	3.24	1.43	1
3.	For paying an insurance premium	3.18	1.36	2
4.	For children’s education	3.00	1.29	3
5.	For buying home	2.91	1.47	4
6.	For marriage	2.88	1.43	5
7.	For holiday vacations	2.28	1.29	7
Average		2.91	1.39	

Source: Authors compilation

Table 4.2.2 depicts the seven different types of objectives of savings of retail investors’ based on mean score rankings. Majority of investors’ main objective is tax-saving. The mean score of tax saving is 3.24 and the standard deviation is 1.43. The second rank is given to paying insurance premium with the average value is 3.18 and the standard deviation of 1.36. Very few respondents have relied heavily on it for holiday vacation trip purpose.

4.3. Analysis of retail investors’ behaviour and investment decisions

This part of the study focuses on testing a well-established theory using confirmatory factor analysis to test the hypothesized relations. Data were analysed with IBM SPSS 20 and IBM AMOS 20.

Confirmatory factor analysis-measurement model

Confirmatory Factor Analysis (CFA) is for validating the factor structure of a set of variables. CFA helps to understand if the relation of underlying constructs and observed variables existed (Suhr, 2006). The confirmatory measurement model is used to estimate what extent exogenous variables explain the latent variable constructs.

Structural equation modeling (SEM)

Structural equation modeling is used to examine the relation between the latent and the observed/measured variables. The researcher can measure only the observed/measured variables and not the latent variables. Hence, the researcher develops a conceptual model to identify observed/measured variables and is also able to express latent variables in terms of observed/measured variables. For developing the SEM framework, IBM AMOS 20 statistical software has been used for the measurement and structural model. The structural component models determine the relation between the latent variable constructs and the measurement component models and also explains how exogenous variables measure the latent variable constructs. Both the models, measurement, and structural model combine to create a holistic model that broadly describes the relation amongst the variables.

For estimation of different factors affecting retail investors' behaviour in investment decisions the factors included in the model are the behavioural, socio-economic factors, and financial literacy. Behavioural factors comprise of personal factors, herding factors; loss aversion; ability bias; regret bias; endowment bias; overconfidence; and mental accounting. Socio-economic factors cover market factors; social factors; and firm factors. The factors were chosen from earlier literature on investment decision studies, covering behavioural aspect and socio-economic aspect. The investment decision scale

construct covers returns, risk, and prior information. The details of the constructs along with supportive literature is presented through appendix I.

The measurement component model represents a confirmatory factor analysis that describes the pattern of how every measure loads on the particular latent factor. It describes the relation of observed and unobserved variables. The measurement model deals with validating the model. The model was tested based on the data of the present research. It is comprised of all observed variables.

Measurement Model Validation

For estimation of the measurement model, it is essential to establish the validity and reliability checks of the tool and show the correct result (Linn, 2000). Its measures are divided into four types. These are explained as:

Composite reliability (CR): It represents the degree to which measurements are error-free and yield consistent results. The standardized threshold value used for is that CR should be equal to or greater than 0.7.

CR= (square of summed standardized loadings)/ (square of summed standardized loadings+ sum of measurement error variances)

$$CR = \frac{(\sum \lambda_i)^2}{[\sum \lambda_i^2 + \sum(\delta_i)]}$$

Where λ represents the standardized factor loadings; ε is the indicator measurement error.

Convergent validity: The measured items within a construct should correlate strongly. If the standardized factor loadings are high then Convergent validity is high. The variance extracted (AVE) should be greater than 0.5.

Average variance extracted (Hair *et al.*, (2010) has been calculated as:

AVE= (sum of squared standardized loadings)/ (sum of squared standardized loadings + sum of measurement error variances)

$$AVE = \frac{\sum \lambda_i^2}{\sum \lambda_i^2 + \sum \delta_i}$$

Where λ is the standardized factor loading; ϵ is the indicator measurement error

Content validity: It refers to how well a test represents the elements of the given construct. It has been also mentioned in section 3.4 of chapter 3, research design, and methodology.

Discriminant validity: This discusses the extent of the importance of the latent variables. According to O' Leary-Kelly & Vokurka, (1998), it is established if the latent variable should not correlate with any other variables. It is considered when square-root of AVE of all latent variables are more than the other.

4.3.1. Financial product preference of the respondents

Objective 1 (O1): To investigate the financial product preference of the respondents.

It is vital to recognize how demographics influence investment decisions, especially taking into view the riskiness of the investment. Thus, to investigate the financial product preference of the respondents, thirteen investment products were considered. Based on risk these are further classified into three categories. These are: i) low-risk

investment avenues, ii) moderate risk investment avenues, and iii) high-risk investment avenues.

Low-risk investment products: Bank Fixed Deposits (FD), Public Provident Fund (PPF), Post Office Savings, and Government Securities are risk-free investment products or very low-risk investment products.

Moderate risk investment avenues: These comprise of: Mutual Funds, Real Estate, Bonds/ Debentures, and Gold/Silver.

High-risk investment avenues: These are: Equity Share, Commodity Market, FOREX Market, and Chit Funds. These all four investment products represent high-risk investment avenues.

Table 4.3.1 represents the financial product preference of the respondents based on mean and standard deviation and also given a ranking based on the mean. The responses have been rated on a 1 to 5 scale as explained earlier. In low-risk investment avenues, the respondents have given the topmost priority to bank fixed deposits. The mean of bank fixed deposits is very high 2.88 and the standard deviation is 0.95. The second preference of respondents is for public provident fund (PPF) with mean value of 2.87 and std. deviation: 1.34. Life Insurance is the last option of respondents in low-risk avenue section. The mean value is very low at 2.60 and std. deviation is 1.25.

Gold/Silver emerged as the first choice of respondents in moderate risk investment avenues. 2.74 is the mean value and 1.21 is the std. deviation of it. Bonds/ Debentures and Mutual Funds are the second and third preferences of respondents. The last choice of investors in moderate risk investment avenues is real estate and mean value is 2.59 and std. deviation is 1.25.

In high-risk investment avenues, Commodity Market and Equity Share Market emerge as the first and second preference of investors. Mean value of Commodity Market and Equity Share Market is 3.12 and 2.96 respectively. FOREX Market and Chit Fund get the same rank in this investment avenue. The mean value of both investment products is the same 2.82, but standard deviation is different.

Table 4.3.1. Financial product preference of the respondents

Investment Avenues		Mean	Std. Deviation	Rank
Low-Risk Investment Avenues	Bank Fixed Deposits	2.88	0.95	1
	Public Provident Fund	2.87	1.34	2
	Post Office Savings	2.74	1.09	3
	Government Securities	2.67	1.33	4
	Life Insurance	2.60	1.25	5
Moderate Risk Investment Avenues	Gold/Silver	2.74	1.21	1
	Bonds/ Debentures	2.66	1.33	2
	Mutual Funds	2.64	1.01	3
	Real Estate	2.59	1.25	4
High-Risk Investment Avenues	Commodity Market	3.12	1.23	1
	Equity Share Market	2.96	1.30	2
	FOREX Market	2.82	1.16	3
	Chit Fund	2.82	1.27	3

Source: Authors compilation

This primary analysis gave us an insight into the broad preference of Indian retail investors' behavior especially relating it with the riskiness of the financial products. The next stage was to move to the main theme of designing a framework relating factors influencing retail investors' behavior with investment decisions with the mediation of financial literacy. This study has taken Behavioural as well as Socio-Economic Factors as predictors influencing retail investors' behavior.

4.3.2. Analysis of Behavioural and Socio-Economic Factors influencing investors' behavior in Investment Decisions

Objective 2 (O2): To analyse the factors influencing investors' behaviour.

4.3.2.1 Analysis of Behavioural Factors influencing investors' behavior in Investment Decision

All the hypotheses as stated in chapter 2 of the review of literature and hypotheses development were empirically tested and the results have been provided in the section below:

H1: There is a relation between behavioural factors and investment decisions.

The relation between behavioural factors and investment decisions have been represented in Table 6. The behavioural factors covered in the study comprise of: personal factors (PF); herding factors (HF); overconfidence (O); ability bias (AB); loss aversion (LA); regret bias (RB); endowment bias (EB); and mental accounting (MA). Investment decisions has been taken as the dependent factor and comprises of three components, viz. prior information (PI), risk (RI), and returns (RE). Amongst the behavioural factors, ability bias emerged as the strongest factor (estimate=1.186). This was followed by overconfidence (estimate=1.106) and herding factor (estimate=1.090).

Table 4.3.2.1.1. Structural model of behavioural factors and investment decisions

	Estimate	S.E.	C.R.	P
MA <-- BF	1.000			
RB <-- BF	1.011	.071	14.193	.000
LA <-- BF	.795	.059	13.413	.000
EB <-- BF	.245	.080	3.054	.002
AB <-- BF	1.186	.094	12.673	.000
O <-- BF	1.106	.093	11.893	.000
HF <-- BF	1.090	.091	11.939	.000
PF <-- BF	.738	.078	9.520	.000
RE <-- ID	1.000			
RI <-- ID	.869	.072	12.038	.000
PI <-- ID	1.040	.083	12.589	.000

Source: Authors compilation [***p≤.001; **p≤.01; *p≤.05]

All these latent variables viz., mental accounting, regret bias, loss aversion, endowment bias, ability bias, overconfidence, herding factors, and personal factors are showing a direct positive impact on behavioural factors. Risk, return and prior information are positively related with investment decisions. The critical ratio of all these variables is higher than the critical value (1.96) and associated p-value <0.05. As desired all the values of estimates are greater than 0.05. All the critical ratios, are significant.

Table 4.3.2.1.2. Correlation matrix of behavioural factors and investment decisions

PF	HF	O	AB	EB	LA	RB	MA	RE	RI	PI
PF										
HF	.435**									
O	.330**	.607**								
AB	.347**	.475**	.529**							
EB	.042	.080	.270**	.335**						
LA	.267**	.292**	.428**	.498**	.178**					
RB	.243**	.347**	.456**	.429**	.130**	.539**				
MA	.268**	.445**	.437**	.470**	.156**	.525**	.581**			
RE	.358**	.372**	.380**	.311**	.030	.319**	.328**	.400**		
RI	.252**	.367**	.361**	.234**	.196**	.215**	.317**	.439**	.621**	
PI	.321**	.337**	.335**	.305**	.002	.306**	.326**	.499**	.610**	.615**

Source: Authors compilation [***p≤.001; **p≤.01; *p≤.05] (2-tailed)

Table 4.3.2.1.2 displays the correlation coefficients among all the latent variables of behavioural factors and investment decisions. Majority of correlation coefficients of latent variables of behavioural factor and investment decision are relatively good and significant. Endowment bias; personal factors; herding factors; return; and prior information are exceptions. The highest correlation is found between the risk and return (62.1%).

The researcher initially covers the relation of behavioural factors and socio-economic factors with investment decision individually and then have taken a comprehensive model covering all aspects of investors' behavior, viz. behavioural factors; socio-economic factors; and financial literacy to understand the influence on Investment decisions. Path analysis of behavioural factors and investment decisions is highlighted through table 4.3.2.1.3.

Table 4.3.2.1.3. Path analysis of behavioural factors and investment decisions

	Estimate	R ²	P
Investment Decision <--- Behavioural Factors	0.928	0.229	.000
Goodness of fit CMIN/df=4.362, NFI=0.959, RFI=0.890,TLI=0.913, CFI=0.967, RMSEA=0.074			

Source: Authors compilation [***p≤.001; **p≤.01; *p≤.05]

The behavioural factors have a significant positive relation with investment decisions (standardized factor loading=0.928, R²=0.229, and p<0.001). Thus, the results empirically supported hypothesis *H₁: There is a relation between behavioural factors and investment decisions.*

4.3.2.2 Analysis of Socio-Economic Factors influencing investors' behavior in Investment Decisions

H₂: There is a relation between socio-economic factors and investment decisions.

The independent variable, socio-economic factors cover Market (M), Firm (F), and social (S) and investment decisions is dependent variable as discussed in section 4.3. Firm emerged as the strongest factor (estimate=1.729). This was followed by market factor (estimate=1.273).

Table 4.3.2.2.1. Structural model of Socio-Economic Factors and Investment Decisions

			Estimate	S.E.	C.R.	P
RE	<---	ID	1.000			
RI	<---	ID	1.107	.060	18.336	.000
PI	<---	ID	1.116	.063	17.620	.000
S	<---	SEF	1.000			
F	<---	SEF	1.729	.208	8.294	.000
M	<---	SEF	1.273	.128	9.978	.000

Source: Authors compilation [*** $p \leq .001$; ** $p \leq .01$; * $p \leq .05$]

Social, market, firm, are the socio-economic factors. Risk, return and prior information are the factors of investment decisions. All the estimates are significant as $p \leq .001$. This suggests their importance in contracts, viz. Socio-economic factors and Investment decision.

Table 4.3.2.2.2. Correlation matrix of Socio-Economic Factors and Investment Decision

	M	F	S	RE	RI	PI
M						
F	.556**					
S	.304**	.422**				
RE	.420**	.364**	.403**			
RI	.502**	.511**	.355**	.621**		
PI	.450**	.432**	.393**	.610**	.615**	

Source: Authors compilation [*** $p \leq .001$; ** $p \leq .01$; * $p \leq .05$ (**2-tailed**)]

Table 4.3.2.2.2 presents correlation coefficients among all the components of socio-economic factors and investment decisions. The correlation coefficients are good and are statistically significant. The highest correlation is found between the risk and return, i.e. 62.1%.

Table 4.3.2.2.3. Path analysis of Socio-Economic Factors and Investment Decisions

	Estimate	R ²	P
Investment Decision <--- Socio-Economic Factors	1.419	0.259	.000
Goodness of fit CMIN/df=4.671,RFI=0.927, NFI=0.983, TLI=0.942, CFI=0.986, RMSEA=0.077			

Source: Authors compilation [***p≤.001; **p≤.01; *p≤.05]

Moving further, table 4.3.2.2.3 shows the result of the path analysis of the association between socio-economic factors and investment decisions. The path coefficient is 1.419, having R²=0.259 at p<0.001. Hence, socio-economic factors confirmed a significant positive relation with investment decisions. Thus, the results empirically support the hypothesis *H2: There is a relation between Socio-Economic Factors and investment decisions.*

These outcomes indicate that behavioural factors and socio-economic factors influence investors' behavior and support that there is a positive relation of behavioural factors, with investment decisions. The findings also indicate a positive and significant relation of socio-economic factors with investment decisions.

4.3.3. Analysis of relation between financial literacy, risk-bearing capacity and investment decisions and designing of a model relating retail investors' behaviour with investment decisions

4.3.3.1 Measurement model

The study needs to estimate the reliability and validity of the proposed measurement model (Kline, 2011). Table 4.3.3.1 represents the values of factor loadings (LV) and composite reliability (CR). Average variance extracted (AVE) of the model are also presented. Reliability and validity are checked of all exogenous and endogenous variables Viz., behavioural factors (BF), socio-economic factors (SEF), financial literacy, and investment decisions (ID).

There are eight sub-factors in behavioural factors and there are thirty items in this construct. There are three sub-factors in socio-economic factors and there are fifteen items in this construct. In the next phase, the current research plans to examine the mediating effect of financial literacy among behavioural factors, socio-economic factors, and investment decisions. There are twelve items in this construct. Investment decisions are a dependent variable. It is composed of eleven items. It is comprised of three sub-factors, viz. risk, return, and prior information.

According to Hamid et al. (2017), the composite reliability (CR) should be greater than 0.70. The acceptable range of average variance extracted (AVE) should be greater than 0.50. As depicted in table 4.3.3.1, the values of CR for Personal Factor (PF), Herding Factor (HF), Overconfidence (O), Ability Bias (AB), Endowment Bias (EB), Loss Aversion (LA), Regret Bias (RB), Mental Accounting (MA), Market (M), Firm (F), Social (S), Financial Literacy (FL), Return (RE), Risk (RI), Prior Information (PI) are greater than the acceptable range of 0.70 respectively. Literacy is a little lower value in AVE, however, the composite reliability is 0.894, hence it has been included for further analysis. Hence, we are including the factor as such. Loss aversion also has a little lower AVE value, i.e. 0.490, however it is close to 0.50 and hence included for further analysis. The values of AVE of all other factors are more than 0.50 as represented in Table 4.3.3.1.

Table 4.3.3.1. Factor Loadings, Composite Reliability, and AVE of the Model

Factor Name	Items Name	Items Code	L.V.	Composite Reliability	AVE
Behavioural Factors (BF)	Personal Factor (PF)	PF1	0.722	0.843	0.518
		PF2	0.676		
		PF3	0.701		
		PF4	0.756		
		PF5	0.740		
	Herding Factor (HF)	HF1	0.655	0.826	0.543
		HF2	0.806		

		HF3	0.766		
		HF4	0.713		
	Overconfidence (O)	O1	0.737	0.812	0.520
		O2	0.754		
		O3	0.749		
		O4	0.639		
	Ability Bias (AB)	AB1	0.589	0.795	0.570
		AB2	0.860		
		AB3	0.789		
	Endowment Bias (EB)	EB1	0.731	0.697	0.534
		EB2	0.731		
	Loss Aversion (LA)	LA1	0.651	0.792	0.490
		LA2	0.762		
		LA3	0.730		
		LA4	0.649		
	Regret Bias (RB)	RB1	0.696	0.848	0.583
		RB2	0.734		
		RB3	0.810		
		RB4	0.807		
	Mental Accounting (MA)	MA1	0.501	0.823	0.545
		MA2	0.768		
		MA3	0.832		
		MA4	0.805		
Socio-Economic Factors (SF)	Market (M)	M1	0.675	0.852	0.591
		M2	0.786		
		M3	0.833		
		M4	0.773		
	Firm (F)	F1	0.566	0.860	0.508
		F2	0.748		
		F3	0.788		

		F4	0.766		
		F5	0.727		
		F6	0.658		
	Social (S)	S1	0.651	0.866	0.567
		S2	0.845		
		S3	0.841		
		S4	0.764		
		S5	0.636		
Financial literacy (FL)	Financial Literacy (FL)	FL1	0.573	0.894	0.415
		FL2	0.656		
		FL3	0.689		
		FL4	0.688		
		FL5	0.693		
		FL6	0.666		
		FL7	0.580		
		FL8	0.654		
		FL9	0.752		
		FL10	0.688		
		FL11	0.515		
		FL12	0.529		
Investment decisions (ID)	Return (RE)	RE1	0.733	0.871	0.629
		RE2	0.797		
		RE3	0.823		
		RE4	0.816		
	Risk (RI)	RI1	0.778	0.864	0.613
		RI2	0.777		
		RI3	0.770		
		RI4	0.806		
	Prior Information (PI)	PI1	0.775	0.877	0.705
		PI2	0.857		

		PI3	0.883		
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Source: Authors compilation

The next objectives are:

Objective 3 (O3): To examine the relation between risk-bearing capacity and investment decisions.

Objective 4 (O4): To examine the relation between financial literacy and investment decisions.

Objective 5 (O5): To design a model relating to retail investor behavior and investment decisions.

The related hypotheses are:

H3: There is a relation between risk-bearing capacity and investment decisions.

H4: The relation between behavioural factors and investment decisions is strengthened with financial literacy as mediator.

H5: The relation between Socio-Economic Factors and investment decisions is strengthened with financial literacy as mediator.

Prior information, risk and returns, all are important components of investment decisions as highlighted in SEM-AMOS analysis and depicted through figure 4.3.3.1. The results suggest a positive relation. Thus, it can be inferred that hypothesis *H3: there is a relation between risk-bearing capacity and investment decisions* has been empirically supported.

The results of the structural model of behavioural factors, socio-economic factors, and investment decisions with the mediating effect of financial literacy are summarized in Table 4.3.3.2. All factors of latent variables have already been discussed in the above sections. Ability bias has emerged as the strongest factor (estimate=2.191). This was followed by overconfidence (estimate=2.068) and regret bias (estimate=1.823).

Table 4.3.3.2. The Regression Path Coefficient and Significances for the Model

	Estimate	S.E.	C.R.	P
PF <--- BF	1.000			
HF <--- BF	1.822	0.211	8.627	.000
O <--- BF	2.068	0.249	8.316	.000
AB <--- BF	2.191	0.258	8.484	.000
EB <--- BF	0.821	0.157	5.220	.000
LA <--- BF	1.584	0.192	8.241	.000
RB <--- BF	1.823	0.228	8.003	.000
MA <--- BF	1.814	0.221	8.219	.000
FL <--- BF	0.735	0.113	6.485	.000
ID <--- BF	0.864	0.137	6.317	.000
S <--- SEF	1.000			
F <--- SEF	1.530	0.164	9.355	.000
M <--- SEF	1.158	0.125	9.243	.000
FL <--- SEF	0.758	0.090	8.403	.000
ID <--- SEF	0.588	0.094	6.274	.000
ID <--- FL	0.344	0.052	6.639	.000
RE <--- ID	1.000			
RI <--- ID	0.970	0.070	13.804	.000
PI <--- ID	1.130	0.080	14.110	.000

Source: Authors compilation [***p≤.001; **p≤.01; *p≤.05]

Personal factors, herding factors, overconfidence, ability bias, endowment bias, loss aversion, regret bias, mental accounting are showing are positively related with behavioural factors. Similarly, social, market, firm factors are positively related with socio-economic factors. Risk, return and prior information are also directly related with investment decisions. The critical ratios of all these variables are significant. The highest critical ratio is 14.110 for prior information. The standard estimate and critical

ratio of financial literacy and risk are 0.344 and 0.970, 6.639, and 13.804 respectively and are also significant.

Table 4.3.3.3. Correlation matrix of Behavioural Factors, Socio-Economic Factors, Financial Literacy and Investment Decision

	PF	HF	O	AB	EB	LA	RB	MA	M	F	S	FL	RE	RI	PI
PF															
HF	.435**														
O	.330**	.607**													
AB	.347**	.475**	.529**												
EB	.042	.080	.270**	.335**											
LA	.267**	.292**	.428**	.498**	.178**										
RB	.243**	.347**	.456**	.429**	.130**	.539**									
MA	.268**	.445**	.437**	.470**	.156**	.525**	.581**								
M	.234**	.423**	.362**	.424**	.268**	.325**	.360**	.553**							
F	.254**	.222**	.170**	.187**	.081*	.254**	.364**	.421**	.556**						
S	.437**	.345**	.271**	.178**	.031	.167**	.195**	.343**	.304**	.422**					
FL	.395**	.314**	.349**	.300**	.045	.307**	.338**	.489**	.419**	.482**	.565**				
RE	.358**	.372**	.380**	.311**	.030	.319**	.328**	.400**	.420**	.364**	.403**	.669**			
RI	.252**	.367**	.361**	.234**	.196**	.215**	.317**	.439**	.502**	.511**	.355**	.494**	.621**		
PI	.321**	.337**	.335**	.305**	.002	.306**	.326**	.499**	.450**	.432**	.393**	.553**	.610**	.615**	

[***p<.001; **p<.01; *p<.05] (2 Tailed)

Table 4.3.3.3 depicts the correlation coefficients among the components of behavioural factors, socio-economic factors, financial literacy, and investment decisions. The correlation coefficients of almost all components are relatively good and significant. The highest correlation is found between the return and financial literacy of 66.9%.

Table 4.3.3.4. The Overall measurement Model Fit Indices

Name of Fit Indices		Level of Acceptance	Index Value
Chi-square (X²)	X ² value	P>0.05	266.896
	P-value at 0.05		0.000
	DF		61
Absolute Fit Indices	GFI	>0.90	0.95
	RMSEA	<0.08	0.075
	RMR		0.066
	Normed X ²	<2-5	4.375
Incremental Fit Indices	NFI	>0.90	0.94
	CFI		0.95
	TLI		0.91
Parsimony Fit Indices	AGFI		0.90

Source: Authors compilation

Goodness of Fit Index (GFI), Root Mean Square Error of Approximation (RMSEA), Root Mean Square Residual (RMR), Normed Chi-square, Normed Fit Index (NFI), Comparative Fit Index (CFI), Tucker Lewis Index (TLI), and Adjusted Goodness of Fit Index (AGFI) were used along with Chi-square statistics. These fit indices are mainly used for statistical measuring the model (Hair et.al. 1998).

Table 4.3.3.4 depicts the value of the overall measurement model fit indices. The structural model fit of this study is very good with GFI = 0.95; TLI = 0.91; CFI = 0.95; RMSEA = 0.075, CMIN/df = 4.375, and p-value = 0.000. These indexes show a strong analytical validity of the structural model. The model fit indices meet the required level and this suggests that the data fit the proposed model, as per the criterion recommended by Hair et.al. 2010 and Kline, 2011.

Table 4.3.3.5. Path analysis of Behavioural Factors, Socio-Economic Factors, Financial Literacy and Investment Decision

	Direct Effect	Total Effect	Comment	R-square
FL <--- BF	0.735***	0.735 + 0.344 = 1.079	With Mediator	0.180
ID <--- FL	0.344***			0.306
FL <--- SEF	0.758***			0.20
ID <--- BF	0.864***		Without Mediator	0.229
ID <--- SEF	0.588***		Without Mediator	0.259

Source: Authors compilation [***p≤.001; **p≤.01; *p≤.05]

The last objective was to design a model relating to retail investor behavior and investment decisions. Retail investors' behaviour was measured through behavioural and Socio-economic factors. As per proposed model financial literacy is mediating between behavioural factors and investment decisions and also between socio-economic factors and investment decisions. The results of the direct as well as the indirect effects of the model are shown through table 4.3.3.5 and figure 4.3.3.1.

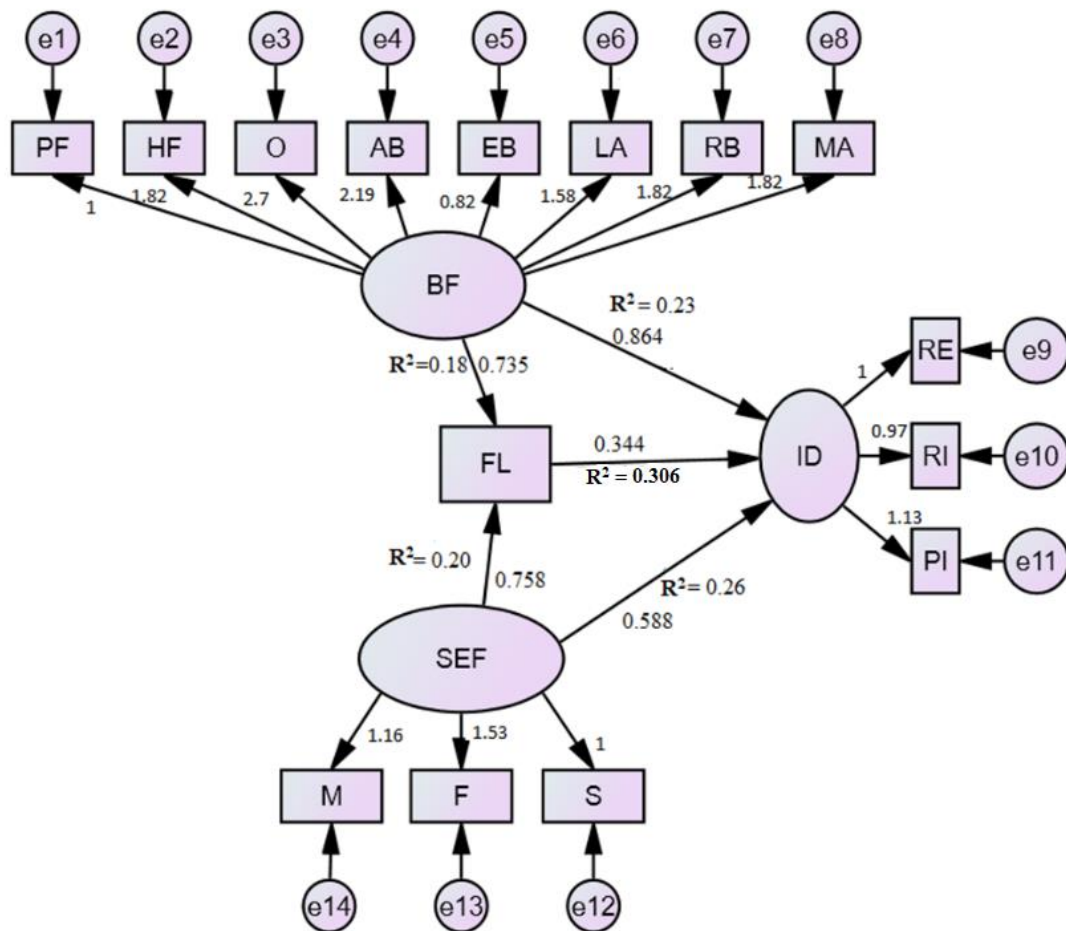
The direct effects of behavioural factors on investment decisions are 0.735. But after using the mediator (financial literacy) the value of path coefficient increases to 1.079 (0.735 + 0.344). Similarly, the value of the direct effect of socio-economic factors to investment decisions is 0.758 and the indirect effect of path coefficient value is 1.102 (0.758 + 0.344). With the mediating role of financial literacy, the path coefficient value of socio-economic factors to investment decisions improves. These path coefficient values are significant too.

In this theoretical model (Figure 4.3.3.1), behavioural factors are only explaining 18 percent ($R^2 = 0.180$) of the variance in financial literacy and 22.9 percent ($R^2 = 0.229$) of the variance in investment decisions. Similarly, socio-economic factors are only explained by 20 percent ($R^2 = 0.20$) of the variance in financial literacy and 25.9 percent

($R^2 = 0.259$) of the variance in investment decisions. However, with financial literacy as mediation, the explanatory power was enhanced to 30.6 percent ($R^2 = 0.306$).

Thus, these all support the hypotheses H3: that there is a positive relation between risk-bearing capacity and investment decisions. The findings are encouraging and support H4: The relation between behavioural factors and investment decisions is positive and is strengthened with financial literacy as a mediator and H5: The relation between Socio-Economic Factors and investment decisions is positive and is strengthened with financial literacy as a mediator. Hence all these hypotheses are empirically supported.

Figure 4.3.3.1. Theoretical model depicting the relation between retail investors' behaviour and investment decisions



4.4 Discussion

Behavioural factors included overconfidence, herd behaviour, optimism, cognitive bias and fear of loss. Mental accounting and regret bias also influence investment decisions (Oprean, 2014; Ritter, 2003; Shefrin, 2001; Wood & Zaichkowsky, 2004). The results highlight Socio-economic factors have a significant impact on investment decisions. This is corroborated by Nagy and Obenberger (1994) and Dew and Xiao (2011) who reported that individual investor behaviour is influenced by socio-economic factors. This is also supported by Suman (2012) that the level of annual income and savings influences investment decisions. Lodhi (2014) reported that financial literacy and accounting information helped investors invest in risky instruments. The results of the present study highlight that broad overview and technical knowledge also influence financial literacy. Several researchers found that the financial literacy positively

influenced investment decisions (Lusardi and Tufano, 2015; Nguyen et. al., 2017; Rodrigues et. al., 2019). However, this study has taken mediation effect of financial literacy. This helped enhance impact of Behavioural and socio-economic factors on investment decision making.

4.5 Concluding remarks

This chapter covered the analysis of the collected data from north Indian retail investors'. It starts with the detailed result of the demographic profile of respondents. This chapter emphasizes to investigate the financial product preference of the respondents. In this chapter, the researcher examines the relation between risk-bearing capacities with investment decisions. The results highlight the relation of behavioural factors and socio-economic factors with investment decisions, where financial literacy has been taken as a mediating factor. The chapter ends with designing a model relating behavioural factors and socio-economic factors through mediation of financial literacy with investment decision.

CHAPTER 5

CONCLUSION

After analysing the related research questions in Chapter IV, this chapter, throws light on the major findings of this research. Section 5.1 of this chapter covers the major findings of the current research. Revisiting of the objectives to discover how the objectives have been achieved is covered in Section 5.2. Figure 5.1 provides a complete view of research. The implications of the current research are projected in Section 5.3 projects. The final section 5.4 covers the limitation and future scope.

5.1 Major findings of the study

The research has been undertaken to examine the relation between retail investors' behavior and investment decision. For analysing retail investors' behavior, the study has taken behavioural and socio-economic factors. The present research also examines their impact on Investment decisions through the mediation of financial literacy. The questionnaires were filled by retail investors'. Data were collected from the population of North-India representing the states of Punjab, Himachal Pradesh, and Haryana through the help of brokerage managers. The major finding of the current study are mentioned below:

- ❖ Results highlight that all factors influence retail investors' behavior in an investment decision. Behavioural factors, socio-economic factors, and Financial Literacy are the predictors and investment decision is the dependent variable.
- ❖ Cronbach's alpha has been computed for all constructs for checking reliability and validity. The Cronbach alpha was in acceptable range for all constructs (Nunnally, 1978; Hair et al., 1995).
- ❖ Investment information sources as suggested by respondents are newspapers, news channels, family/friends/ colleagues, internet, magazines & periodicals, and advisors, or financial planners. The results of access to investment information is based on the mean and standard deviation. Majority of retail

investors preferred access through internet. This was followed information access through Magazines & Periodicals. Newspapers emerged low in priority.

- ❖ Tax saving emerged as the main priority for savings. The second best option as reported by respondents was for payment of insurance premiums. Holiday vacation trip did not emerge in top priority list.
- ❖ The first objective of the current research was related with financial product preference of the respondents. All thirteen financial product preferences were divided into three parts on the basis of risk i.e, low-risk investment avenues, moderate risk investment avenues, and high-risk investment avenues (Sharma & Kaur 2016). In low-risk investment avenues, the investors mostly preferred to invest in bank fixed deposits and the next preference of investors' was public provident fund (PPF). Life Insurance was suggested as the least preferred option in low-risk avenue section.
- ❖ Gold/Silver emerged as the first choice of respondents in moderate risk investment avenues. Bonds/Debentures emerged next in priority, followed by Mutual Funds. The last choice of investors in moderate risk investment avenues was real estate.
- ❖ In high-risk investment avenues, Commodity Market emerged as topmost priority. Equity Share Market was the next to follow. FOREX Market and Chit Fund were low in priority.
- ❖ The proposed research model identified the sub-factors of behavioural factors, socio-economic factors, financial literacy and investment decisions. The study used a confirmatory factor analysis before proceeding for examining the relation of Behavioural and socio-economic factors with investment decisions with mediation effect of financial literacy.
- ❖ The examination through the structural model revealed factors influencing investors' behavior. In the initial analysis the relation between behavioural investment decision was examined Behavioural factors include: personal factors, herding factors, loss aversion, ability bias, regret bias, endowment bias, overconfidence, and mental accounting respectively and the investment decisions comprised of prior information, risk, and returns. The behavioural

factors confirmed a significant positive relation with investment decisions where, standardized factor loading=0.928, $R^2= 0.229$, and $p<0.001$.

- ❖ This was followed by relation between socio-economic factors and investment decisions. Socio-economic factors have included: Market, Firm, and social factors. The results suggest a significant positive relation with investment decisions ($R^2= 0.259$).
- ❖ The results highlight a positive and significant relation between behavioural factors, socio-economic factors, and investment decisions. The results support the mediating role of financial literacy on investment decisions.
- ❖ The structural model fit of this study is very good with GFI = 0.95; TLI = 0.91; CFI = 0.95; RMSEA = 0.075, CMIN/df = 4.375, and p-value = 0.000. These all indexes indicate a strong analytical validity of the structural model for this study. All the values of model fit indices show that the data fits the proposed model, as suggested by Hair et.al. 2010 and Kline, 2011.

5.2 Revising the objectives

It is necessary to revisit the research objectives to see whether the study has been able to accomplish the same.

The first objective of the present research has been:

O1. To investigate the financial product preference of the respondents.

The first objective was to investigate the financial product preference from the thirteen investment products included in survey. These investment products were categorized as low-risk investment; moderate risk investment; and high-risk investment avenues (Sharma & Kaur 2016). Bank Fixed Deposits (FD), Public Provident Fund (PPF), Post Office Savings, and Government Securities are risk-free investment products. Moderate risk investment avenues included: Mutual Funds, Real Estate, Bonds/Debentures, and Gold/Silver. Equity Shares, Commodity Market, FOREX Market, and Chit Fund were categorized in high-risk investment avenues. For achieving this objective rankings were given on the basis of mean and standard deviation (Table 4.3.1). In low-risk investment category, top priority is given to bank fixed deposits. Next to follow them were followed by public provident fund (PPF). Gold/Silver emerged as topmost choice in moderate risk

investment avenues category. Bonds/ Debentures and Mutual Funds are next to follow. In high-risk investment avenues, Commodity Market and Equity Share Market were the first choice. Results are indicative of the fact that motives play an important role in investment decisions. According to (Carroll & Samwick, 1997; Huggett & Ventura, 2000; Lunt & Livingstone, 1991) people with higher income save regularly to achieve their saving objectives. There is supportive evidence that saving of investors depends not only on families' income, but also on motives too (Achar, 2012; Bhardwaj, Raheja, and Priyanka, 2011; Jain & Jain, 2012).

The second objective of the present research was:

O2. To analyze the factors influencing investors' behaviour.

For the analysis of factors influencing investor's behavior, behavioural factors and socio-economic factors were considered. SEM-AMOS was used for testing the hypotheses and for designing the modes. Table 5.2.1 highlights the results of the related hypotheses. The details of findings are provided in preceding chapter.

Table 5.2.1. Hypotheses testing of the factors influencing investor's behaviour

	Hypotheses	Findings	Result
<i>H1</i>	<i>There is a relation between behavioural factors and investment decisions.</i>	<i>The relation between behavioural factors and investment decisions is positive and significant.</i>	Accepted
<i>H2</i>	<i>There is a relation between Socio-Economic Factors and investment decisions.</i>	The relation between socio-economic factors and investment decisions is positive and significant.	Accepted

Source: Authors compilation

The empirical evidence of the present study supports that Behavioural factor constituted by overconfidence, herding factor, cognitive bias, loss aversion, mental accounting, and regret bias influenced investment decisions. There are studies by (Shefrin, 2001; Ritter, 2003; Wood and Zaichkowsky, 2004; Oprean, C.2014). Kahneman and Riepe (1998),

Wamae (2013), Kengatharan (2014), Lim (2012), Luu (2014), Kivetz (1999), supporting that ability bias, herding factor, mental accounting, and personal factor have a significant positive relation between investors' investment decisions. These studies supported that behavioural factors positively affected investors' investment decisions. Thus, it was concluded that behavioural factors and socio-economic factors influence investment decisions.

The next objectives are:

O3. To examine the relation between risk-bearing capacity and investment decisions.

O4: To examine the relation between financial literacy and investment decisions.

O5. To design a model relating retail investor behavior and investment decisions.

The results as shown in preceding chapter highlighted that investment decisions are influenced by risk analytics along with prior information, and return analytics. Garling et al. (2009) suggested risk awareness is important for Investment decision-making process. These findings will help retail investors' to take adequate steps for improving investment decisions.

The findings revealed that there is a positive relation between behavioural factors and investment decisions and the relation is strengthened with the mediating effect of financial literacy. The results of the current research are corroborated by Qadri & Shabbir (2013), and by Bashir et al. (2013). Researchers strongly support that endowment bias, loss aversion, overconfidence, and regret bias influenced retail investors' investment decisions (Atif 2014; Kengatharan, 2014). Further, Lodhi (2014) and Hood et al., (2014) supported a positive significant relationship between financial literacy and investment decisions. This has been supported by other researchers (Lusardi and Tufano, 2015; Nguyen et al. 2017; Rodrigues et. al. 2019). They found that the financial literacy positively influenced investment decisions. However the earlier researchers have not taken financial literacy as a mediating variable. The current research has taken this perspective and the results support the mediating role of financial literacy. Moreover, the relation between behavioural factors and investment decisions has been strengthened with the mediating effect of financial literacy.

Table 5.2.2. Hypotheses testing of the relation among financial literacy, risk-bearing capacity and investment decision

	Hypotheses	Findings	Result
<i>H3</i>	<i>There is a relation between risk-bearing capacity and investment decisions.</i>	<i>The results highlight that risk-bearing capacity is an important factor of investment decisions and is positively related with it.</i>	Accepted
<i>H4</i>	<i>The relation between behavioural factors and investment decisions is strengthened with financial literacy as mediator.</i>	<i>The relation between socio-economic factors and investment decisions is significantly improved with mediation of financial literacy.</i>	Accepted
<i>H5</i>	<i>The relation between Socio-Economic Factors and investment decisions is strengthened with financial literacy as mediator.</i>	<i>The relation between socio-economic factors and investment decisions is significantly improved with mediation of Financial literacy.</i>	Accepted

Source: Authors compilation

The results also suggest a positive relation between socio-economic factors and investment decisions and the relation is strengthened with the mediating effect of financial literacy. There is supportive evidence suggesting that market factor influences investors' behavior in investment decisions (Gupta and Negi, 2014; Hanson et al. 2018; Mehta, Jain, and Yadav, 2014). Similarly, Chong and Lal, (2011), Danso et.al. (2019), and Easley et.al, (2010) supported that firm factor influenced investment decisions. Thus, these results highlight that socio-economic factors have a positive impact on retail investors' investment decisions. These studies analysed the impact of socio-economic factors on retail investors decision making. Aamir Sarwar & Ghadeer Afaf (2016)

highlighted that psychological factors had more influence on individual investor's decision-making than economic factors. The present study has taken financial literacy as a mediating factor to examine the impact of socio-economic factors on investment decisions. The outcomes are very encouraging and support the positive relation between socio-economic factors and investment decision and also suggest that this relation is strengthened with the mediating effect of financial literacy. These results are contribution towards literature on behavioural finance. The results suggest that the impact of behavioural factors is higher than that of socio-economic factors. This is another major contribution of research.

The study takes a holistic perspective and includes both behavioural and socio-economic factors along with financial literacy to analyse their impact on investment decisions. The complete view of research has been presented through figure 5.1.

A complete view of the research has been presented in Figure 5.1.

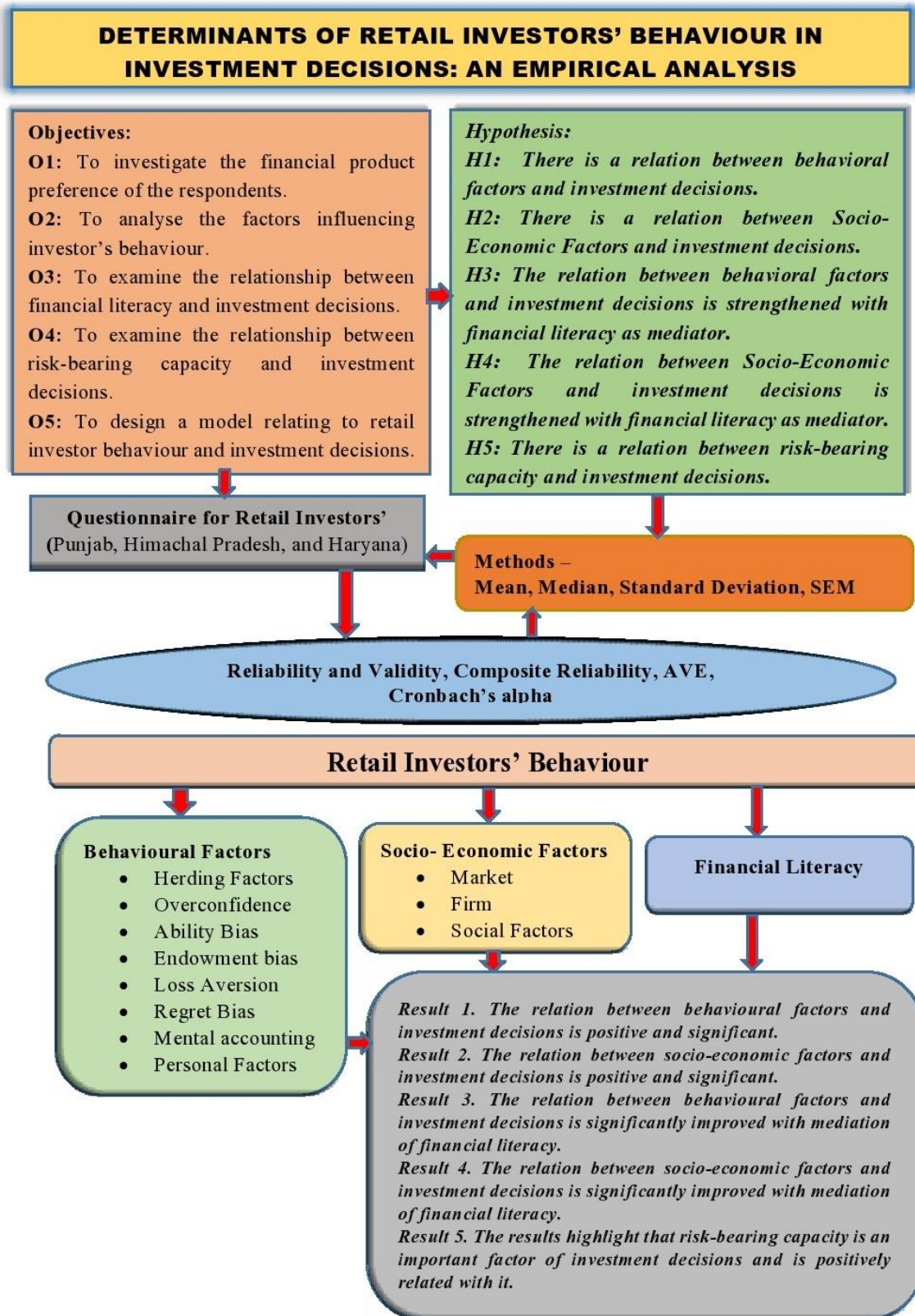


Figure 5.1: Complete overview of research

5.3 Implications of the study

This study will be beneficial for all those prospective investors who want to maximize the value of their investment by paying due attention to different behavioural and socio-economic factors, found significant in the present study. A focus on right product choices will enhance learning about which investment avenues may be chosen. Banks and financial institutions may be benefitted from the findings highlighting the impact of literacy in strengthening impact of behavioural and socio-economic factors on investment decisions. Accordingly steps may be initiated to lure investors focusing on the significant factors. This will help in optimising investment decisions. This study suggests that government and other authorities should take adequate steps for improving financial literacy of individual investors'. The financially literate public may contribute to the national development and growth of the economy. Financial literacy will also be helpful for investors to choose the correct investment alternative, to meet their objective and also maximize the value of their investment.

5.4 Limitations and future research

Like in any research study, the current research also has some limitations. However, the limitations enhance the scope for future research. The first limitation of this research is that data collected from only three North Indian states (Punjab, Himachal Pradesh, and Haryana). This reduces the generalisations of the current research. However, these three states are growing states and may be considered to represent India as a whole. Moreover, India is a growing economy and the results of the present study may be applicable to similar developing economies. This research study has been done on a cross-sectional survey method, which means that the data was collected once. It may also be useful to investigate other factors influencing investment decisions, and to compare them, to detect any differences made by their impact on investment decisions. Future research also can be a comparative study of analysing the difference in rural and urban retail investors' behavior.

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Questionnaire

Dear Respondent,

I am a research scholar doing Ph.D. on the topic ‘Determinants of Retail Investors’ Behaviour in Investment Decisions: An Empirical Analysis’. Kindly fill the questionnaire aimed at gauging retail investors’ behaviour in investment decisions. The data provided by you will be kept confidential as it is an academic research. Thank you very much for sparing your precious time.

Swati (Research Scholar)

Thapar Institute of Engineering & Technology, Patiala (Punjab)

A. Personal Information:

1. Name:	2. Contact No.: (Optional)
3. Where are you located.....?	4. Gender: <input type="checkbox"/> Male <input type="checkbox"/> Female
5. Age: <input type="checkbox"/> 25 -35 <input type="checkbox"/> 35 -45 <input type="checkbox"/> 45 and above	6. Marital status: <input type="checkbox"/> Married <input type="checkbox"/> Single
7. Educational status? <input type="checkbox"/> Matriculate <input type="checkbox"/> Under graduate <input type="checkbox"/> Post graduate	8. Occupation? <input type="checkbox"/> Business <input type="checkbox"/> Salaried

9. What is your designation.....? (Please specified)	10. If salaried, in which organisation are you working? <input type="checkbox"/> Govt. <input type="checkbox"/> Private
11. Annual Income in Rs: <input type="checkbox"/> Below Rs 5,00,000 <input type="checkbox"/> Rs5,00,000 - 10,00,000 <input type="checkbox"/> Above 10,00,000	12. How much do you save annually (in Rs. Approx)? <input type="checkbox"/> Below Rs. 1,50,000 <input type="checkbox"/> Rs.1,50,000 to 3,00,000 <input type="checkbox"/> More than Rs. 3,00,000
13. Do you have a De-mat a/c? <input type="checkbox"/> Yes <input type="checkbox"/> No	14. Do you have a financial advisor? <input type="checkbox"/> Yes <input type="checkbox"/> No

B. Please read each statement carefully and rate/ tick each statement according to the 1 to 5 scale (Least preferable to more preferable).

15. Where do you get the information related to investment?	Kindly tick Investment preference of financial product. 1 to 5 scale (Least preferable to most preferable).					
i. Newspaper	1	2	3	4	5	
ii. News Channels	1	2	3	4	5	
iii. Family/Friends/ Colleagues	1	2	3	4	5	
iv. Internet	1	2	3	4	5	
v. Magazines & Periodicals	1	2	3	4	5	
vi. Advisors / Financial Planners	1	2	3	4	5	
16. Your objectives of savings.						
i. To accumulate funds for Retirement purpose	1	2	3	4	5	
ii. For tax saving	1	2	3	4	5	
iii. For paying insurance premium	1	2	3	4	5	

iv. For children's education	1	2	3	4	5
v. For buying home	1	2	3	4	5
vi. For marriage	1	2	3	4	5
vii. For holiday vacations	1	2	3	4	5

17. You prefer to Invest in :

I. Savings Account.	1	2	3	4	5
II. Bank Fixed Deposits.	1	2	3	4	5
III. Public Provident Fund.	1	2	3	4	5
IV. National Savings Certificates.	1	2	3	4	5
V. Post Office Savings.	1	2	3	4	5
VI. Government Securities.	1	2	3	4	5
VII. Real Estate (property)	1	2	3	4	5
VIII. Gold/Silver.	1	2	3	4	5
IX. Chit Funds.	1	2	3	4	5
X. Mutual Funds.	1	2	3	4	5
XI. Life Insurance.	1	2	3	4	5
XII. Debentures.	1	2	3	4	5
XIII. Bonds.	1	2	3	4	5
XIV. Art and Passion.	1	2	3	4	5
XV. Equity Share Market.	1	2	3	4	5
XVI. Commodity Market.	1	2	3	4	5
XVII. FOREX Market.	1	2	3	4	5

18.1. Behavioural Factors Influencing Retail Investors Investment Decisions

Herding Factors	Other investors' decisions of choosing stock types have impact on your investment decisions.	1	2	3	4	5
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	Other investors' decisions of the stock volume have impact on your investment decisions.	1	2	3	4	5
	Other investors' decisions of buying and selling stocks have impact on your investment decisions.	1	2	3	4	5
	You usually react quickly to the changes of other investors' decisions and follow their reactions to the stock market.	1	2	3	4	5
Overconfidence	You believe that your Knowledge of stock market can help you to outperform the market.	1	2	3	4	5
	You are normally able to anticipate the end of good or poor.	1	2	3	4	5
	You get optimistic when the market goes up, assuming it will continue to do so.	1	2	3	4	5
	You think you can consistently time the market.	1	2	3	4	5
Ability Bias	You forecast the changes in stock prices in the future based on the recent stock prices	1	2	3	4	5
	You prefer to buy local stocks than international stocks because the information of local stocks is more available.	1	2	3	4	5
	You are capable of your ability to gauge market changes accurately.	1	2	3	4	5
Endowment bias	You tend to value something you own.	1	2	3	4	5
	You are willing to pay a price lower for the stock you have now than the price you purchased it for.					

		1	2	3	4	5
Loss Aversion	You are more stressed by prospective losses.	1	2	3	4	5
	You avoid selling shares that have decreased in value	1	2	3	4	5
	You willingly remain in a risky stock position, hoping the price will bounce back	1	2	3	4	5
	After a prior loss, you become more risk averse.	1	2	3	4	5
	You believe that today's losers may soon outperform today's winners.	1	2	3	4	5
Regret Bias	While selling a stock, you become emotionally affected by the price at which you purchased the stock.	1	2	3	4	5
	You avoid selling a stock to avoid the regret of having made a bad investment.	1	2	3	4	5
	You regret when you find a stock you had considered buying but did not went up in value.	1	2	3	4	5
	You use conventional wisdom and buy only stocks that everyone else is buying.	1	2	3	4	5
Mental Accounting	You hesitate to sell an investment that once had monstrous gains and now has a modest gain	1	2	3	4	5
	During an economic boom and bullish market, you get accustomed to healthy gains	1	2	3	4	5

	When the market correction deflates investor's net worth, you are hesitant to sell at the smaller profit margin.	1	2	3	4	5
	You wait for the return of the gainful period to sell your stock.	1	2	3	4	5
18.2. Market, Firm and Social Factors Influencing Retail Investors Investment Decisions						
Market	You consider carefully the price changes of stocks that you intend to invest in.	1	2	3	4	5
	Market information is important for your stock investment.	1	2	3	4	5
	You put the past trends of stocks under your consideration for your investment.	1	2	3	4	5
	You keep a track of market changes to help you in investment.	1	2	3	4	5
Firm	You look at firm's image before investment.	1	2	3	4	5
	You prefer past investment experiences in firms before investment.	1	2	3	4	5
	You are concerned about security grading before investment.	1	2	3	4	5
	You prefer to invest in firms which have are socially responsible.	1	2	3	4	5
	Norms and Values of Firms Influences your investment.	1	2	3	4	5
	Firms with environmental and social concerns have a higher implied cost of equity capital.	1	2	3	4	5
Social	Your investment is affected by Social Structure	1	2	3	4	5

	Your investment is affected by Religious views.	1	2	3	4	5
	Your investment is affected by Political views.	1	2	3	4	5
	4. Family structure affects your investment Behaviour.	1	2	3	4	5
	5. Family financial budget affects your investment Behaviour.	1	2	3	4	5
19.1. Knowledge level of Investors and Investment Decisions						
Financial Literacy	You feel capable of handling your financial future (e.g. buying insurance or investments).	1	2	3	4	5
	You prefer a high-risk and high-return investment strategy.	1	2	3	4	5
	Your finances are a significant source of worry or "hassle" for you.	1	2	3	4	5
	You feel in control of my financial situation.	1	2	3	4	5
	You are able to avoid being victimized by financial scams.	1	2	3	4	5
	You buy the right kind of insurance to protect myself from catastrophic risk.	1	2	3	4	5
	You lead a financially secure life through forming healthy spending habits.	1	2	3	4	5
	You maintain adequate financial records.	1	2	3	4	5
	You are keeping records of income and expenditures.	1	2	3	4	5
	You buy insurance products for investment.	1	2	3	4	5

	You have sufficient information regarding investment alternatives.	1	2	3	4	5
	Investment alternatives help you in tax planning.	1	2	3	4	5
	According to bullish and bearish trends investor you react in the market by purchasing or selling.	1	2	3	4	5
	You have the ability to judge the market trends while investing in stock market.	1	2	3	4	5
19.2. Investment Decision						
Returns	The return rates of recent stock investment meet your expectation.	1	2	3	4	5
	Your rate of return is recently equal to or higher than the average return rate of the market.	1	2	3	4	5
	You feel satisfied with your investment decisions in the last year (including selling, buying, choosing stocks, and deciding the stock volumes).	1	2	3	4	5
	The longer the time-horizon, the greater are the returns on investment	1	2	3	4	5
Risk	Understanding your capacity to take on risk becomes a crucial factor in investment decision making.	1	2	3	4	5
	Riskier investments are expected to be more profitable	1	2	3	4	5
	You try to reduce risk through portfolio diversification.	1	2	3	4	5
	You invest in stocks having higher Beta values	1	2	3	4	5

Prior Information	Information of high rank on listing day influences Investment Decision.	1	2	3	4	5
	Active trading information of stocks in market during past period influences Investment Decision.	1	2	3	4	5
	Information related to market capitalization influences Investment Decision.	1	2	3	4	5

AMOS Model Fit Output**CMIN**

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	59	266.896	61	.000	4.375
Saturated model	120	.000	0		
Independence model	15	4176.605	105	.000	39.777

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.066	.947	.896	.482
Saturated model	.000	1.000		
Independence model	.216	.331	.236	.290

Baseline Comparisons

Model	NFI	RFI	IFI	TLI	CFI
	Delta1	rho1	Delta2	rho2	
Default model	.936	.890	.950	.913	.949
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.581	.544	.552
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	205.896	159.040	260.303
Saturated model	.000	.000	.000
Independence model	4071.605	3863.894	4286.582

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	.446	.344	.266	.435
Saturated model	.000	.000	.000	.000
Independence model	6.973	6.797	6.451	7.156

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.075	.066	.084	.000
Independence model	.254	.248	.261	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	384.896	388.135	644.315	703.315
Saturated model	240.000	246.587	767.632	887.632
Independence model	4206.605	4207.428	4272.559	4287.559

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	.643	.564	.733	.648
Saturated model	.401	.401	.401	.412

Model	ECVI	LO 90	HI 90	MECVI
Independence model	7.023	6.676	7.382	7.024

HOELTER

Model	HOELTER	HOELTER
	.05	.01
Default model	181	202
Independence model	19	21

List of Publications

S. NO	Name of the Journal	Title of Paper	Status of Publication	Journal Coverage
1.	International Journal of Finance & Economics	Influence of Financial Literacy on Retail Investors' Decisions in Relation to Return, Risk and Market Analysis	International Journal of Finance & Economics. (2020), 1–12. https://doi.org/10.1002/ijfe.1920	SSCI, SCOPUS, Web of Science, Listed in ABDC “C” Category Impact Factor: 0.943
2.	International Journal of Finance & Economics	Examining Saving Habits and Discriminating on the Basis of Demographic Factors: A Descriptive Study of Retail Investors'	International Journal of Finance & Economics. (2020) 1–12. https://doi.org/10.1002/ijfe.1939	SSCI, SCOPUS, Web of Science, Listed in ABDC “C” Category Impact Factor: 0.943
3.	The Indian Economic Journal	Behavioral, socio-economic factors, financial literacy and investment decisions are men more rational and women more emotional?	The Indian Economic Journal. (2021), 1-22. DOI: 0.1177/0019466220987023	Listed in ABDC “C” Category

Papers presented in Conferences

S. NO	Author(s)	Year	Title of Paper	Name and Place of conference
1.	Prasad Swati, Kiran Ravi & Sharma R.K	2017	Impact of Financial Literacy on Investment Decisions of Retail Investors': Evidence from Indian Financial Market	International conference on Research & Business Sustainability, IIT Roorkee, Department of Management Studies, Indian Institute of Technology Roorkee, Roorkee and Sheffield Business School, Sheffield Hallam University, United Kingdom & Waikato Management School The University of Waikato, New Zealand Proceedings
2.	Prasad Swati, Kiran Ravi & Sharma R.K	2018	Impact of Behavioural factor on Investment Decision: An Empirical Study of Indian Retail Investors'	International Conference on Recent Trends in Science and Management (ICRTSM 2018) Bharath Institute of Higher Education and Research, Chennai & TECHOWN.
3.	Prasad Swati, Kiran Ravi & Sharma R.K	2020	A Model Examining Influence of Behavioural and Socio-Economic Factors on Investment Decisions: A Gender Wise Analysis	Sixth Biennial Conference of the Indian Academy of Management (INDAM 2020), Indian Institute of Management Tiruchirappalli, Tamilnadu.

RESEARCH ARTICLE

Examining saving habits and discriminating on the basis of demographic factors: A descriptive study of retail investors'

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Abstract

This paper tries to investigate that is there any discrimination in saving habits based on various demographic factors. The study is based on primary data collected through a questionnaire on a Likert Scale of 1–5. Investor's savings habits have been classified as low, medium and high. The findings of the study show that there is significant discrimination in investors' savings habits based on demographic factors. The results of this study help financial institutions and bankers focus on these factors to develop successful strategies to promote saving and investment habits among retail investors.

KEYWORDS

discriminant functions, discriminant score, multiple discriminant analysis, saving habits, Wilks' lambda

1 | INTRODUCTION

Saving plays an important role to grow individually and is also beneficial to society and economy. Changes in saving habits depend upon age, education, occupation, marital status and annual income. Saving is a residual concept defined as the difference between income and consumption. So the saving and spending habits vary in different income levels of individuals. The middle income people believe it to be an essential requirement, just as education of their children and keep it as their top priority. High income level people spend a massive amount on luxury goods and on international brands. Highest income level persons spend on ultra-luxury goods (Burney & Khan, 1992).

Age is another major factor that affects the saving and spending decisions of an individual. Younger generation save less and spend majority of their income on electronic items, home appliances and movies, entertainment and travelling (Davis, 1995). Middle age people save more for their future. The most important goal for saving is for retirement and for buying a house (Hurd, 1989). This is further supported by Burton (2001) who believes that young generation people are not avid savers; however

middle age people save for their retirement. Households' savings are dependent on family income, consumption behaviour and elasticity of consumption.

Bewley (1977) highlighted that precautionary savings in the face of earning risk were the key force driving wealth concentration. However, since the ability to self-insure improved when wealth was large relative to earnings, the nature of precautionary savings implied that the saving rate initially decreased and then turns negative especially when one's net worth was large enough relative to labour earnings. Hence, the saving rate of the wealthy was negative. Low level of domestic savings depressed investment in capital stock and consequently is detrimental to economic growth.

Consumption of savings and investment products was clearly explained by the life-cycle model. The model predicts that young people were not ardent savers. Once children leave home and mortgage is paid off households engage in increasing their saving, primarily for their old age/retirement. Once individuals retire their level of saving is curtailed. The life-cycle model is criticized for not accurately reflecting the household structure of British population (Burton (2001). This is supported by Attanasio (1997). He reiterates that prediction of savings

behaviour based on the life-cycle model has been found inaccurate in Britain, the United States and other advanced economies.

Katona's (1975) considers saving as a function of two sets of factors, the ability to save and the willingness to save. Savings are classified into three types, viz. contractual saving, discretionary saving and residual saving. He considers personal expectations and attitudes as other variables influencing saving. The next section covers the review of literature.

2 | REVIEW OF LITERATURE

This section provides literature review pertaining to saving behaviour of retail investors. Earlier literature suggests saving behaviour of retail investors is affected by age, education, occupation, marital status and annual income. Saving behaviour is dissimilar amongst genders. According to Birkeland (2013) people save money in banks with strong motives viz. for long-term motives, to build wealth and also for old age. Women save more than men. Financial advice may also differ for women and men as far as saving motive is concerned (Hermansson, 2017). It is possible that the saving motives may vary more than the individual's and the household's life cycle (Wärneryd, 1999).

According to the life-cycle theory middle-aged people have a stronger motive to save, especially for retirement than the young or older people (Modigliani & Brumberg, 1954). Retired persons continued to save mainly due to uncertainty or because of their habit (De Nardi, French, & Jones, 2016; Wärneryd, 1999).

Rich people, high-income earners and permanent employees save for difficult times. Short-term savings were motivated by need to reduce income uncertainty (Carroll & Samwick, 1997). According to Lunt and Livingstone (1991) the household savers considered personal control over consumption, in budgeting, in keeping things simple; but the non-savers make their own life more difficult. Mostly investors prefer to invest money in liquid assets or in assets which can be easily converted into cash (Dahlbäck, 1991).

According to Dusenberry (1949) the household savings depended on the level of income, job position on income scale and the ratio of the current income to the peak level income previously reached. Dutt (1972) found two facts about savings. First people wasted lifelong savings on show-off on ceremonies like marriage and so forth. Secondly they had competition to adopt high living standards and compromise spending on elite consumer goods rather than saving for future.

Galgalikar, Shingary, and Doll (1970) examined savings trends in rural areas in Rajasthan. The researchers found that savings and expenditure depended upon income distribution. Here families resorted to borrowings to meet consumption expenditure and savings were very low. In contrast Sharma (1983) opined that in rural areas tendency to save was more than in urban areas; however nature of savings' were different. In rural areas people prefer to save in financial assets like land. They found it convenient and easy and felt that land could easily be converted into money without any loss. Burney and Khan (1992) examined household saving behaviour in Pakistan. The researchers reported that average income of an urban households were higher than that of their rural counterparts. However propensity to save was higher for rural households than the urban households. The researchers' reported dependency ratio and various categories of education had an inverse impact on saving behaviour of both rural and urban households. Furthermore savings increased with age but after a particular limit it tends to diminish.

Bal and Bal (1982) opined that family income influenced demographic and other socio-economic factors. Savings are influenced by not only the number of family, but also by their education level. According to Pandit (1991) the factors that influence savings in India were: income growth; sectoral and functional distribution of income; and by the increase in number of financial institutions. Household savings had a positive relation with age. Some researcher used square of age as exogenous variable instead of taking simple age and found that square of age is inversely related with saving habits. Adding the age squared to age, allow you to model the effect a differing ages, rather than assuming the effect is linear for all ages. It is used to check the rate of change of saving with respect to increasing age of the household head (Burney & Khan, 1992; Gedel, 2012).

Rehman, Faridi, and Bashir (2010) found household savings were significantly and inversely influenced by education of household head, children's educational expenditures, family size, liabilities, marital status and value of house. According to Haruna (2011) savings were not affected by age composition and assets. Household investment determinants included, occupation, expenditure, assets and saving. The determinants of saving variables were: investment, household income, no of dependents, assets and educational status. They found that the age composition and assets did not have a significant effect on saving.

Households changed their "active" saving behaviour, that is, the money they consciously put aside at the end of the month, once they owned a house. Saving was one

of the main sources of wealth accumulation (Ruel & Hauser, 2013). Saving was mainly dependent on current economic resources as only sufficient resources enabled households to set aside part of their income and life choice contingencies. Thus, saving was socially structured and context-dependent. Welfare regimes influenced the occurrence and consequences of life course events and transitions, hence the need for private savings to moderate these risks varied cross-nationally (DiPrete, 2002).

There is intense debate throughout the European Union (European Community, 2007, 2008; World Bank, 2001), including Portugal (Silva, Garcia, & Calado, 2004), to reform social security systems. The role of private occupational pension plans and personal saving plans was being strengthened (Banterle, 2002; Cannon & Tonks, 2004; Davis, 1995). Governments had encouraged personal long-term saving through creation of a stable economic and political environment; establishment of a legal framework for financial institutions and also offered tax incentives to savers (World Bank, 2001).

Harris, Loundes, and Webster (2002) investigated the determinants of saving in Australian families. They cited retirement as the most important reason for savings. Euwals, Eymann, and Börsch-Supan (2004) following the work of Browning (1995, 2000) and Browning and Lusardi (1996) analyzed attitudes of household members and provided evidence on household savings for old age for Dutch. The importance of the precautionary saving motive was evaluated by Kennickell and Lusardi (2005), while Lusardi and Mitchell (2006) emphasized the importance of financial literacy and planning on both savings and portfolio choice. A more radical view of savings and investment behaviour is that researchers should investigate alternative ways in which individuals are saving without using financial institutions. The gender dimension of saving in a post-modern society is an important area of discussion and one which has been given relatively little attention (Firat, 1994). This calls for research in this area.

Deaton (1991) and Carroll and Weil (1994) opined that habits caused expenditure to respond slowly to unexpected growth in earnings, and the result was higher saving, at least in the short run. The estimates of life-cycle models for each country indicated that increases in rates of economic growth had only small effect on aggregate saving rate.

Estimates of the habit-formation models, yielded measures of the effects of past earnings growth on current saving rates within cohorts of individual. It indicated small effects of growth on saving, although the results differed somewhat across countries. Even if the life-cycle model is valid, the estimates of age specific saving rates imply only small effects of growth on the aggregate

saving rate. Although there was some evidence that saving rates followed the hump-shaped pattern indicated in life-cycle theory, it was also the case that income and consumption moved together closely over the life-cycle. The age effects in saving rates were too meagre to imply a great effect of growth on saving. Second, even if a habit-formation model is correct, unanticipated earnings growth produced higher saving rates, the effects of past earnings growth on saving rates were quite small (Paxson, 1996). For retired people, saving was positive, at least for a significant part of the period. According to consumption data savings went up substantially, but it was not reflected in an increase in wealth, nor in self-reported savings (Hurd, 1989).

Some of studies found an important role for demographic considerations in explaining collection of savings patterns. However, demographic variables tend to fare poorly when explaining household-level data (Chamon & Prasad, 2010).

Banerjee, Meng, and Qian (2010) examined the effect of fertility on household savings. Song and Yang (2010) used household-level cross-sectional data and attributed much of the rise in household savings to expectations of a slowdown in income growth over the life cycle. Another study by Meng (2003) explains defensive motives. This study used cross-sectional household level data to identify the effect of employment displacement on the consumption behavior of urban households and highlighted that that savings helped to smooth those shocks.

Chamon, Liu, and Prasad (2013) found that the variance of shocks to household income has increased over time and that the increase is mainly accounted for by a rise in the variance of transitory shocks to income. This increase in transitory uncertainty can help explain the rising saving rates among households with younger household heads (who would need larger buffer stocks of savings to handle these shocks).

Thus, though there are plethora of studies covering the relation of demographic variables with savings, however there has been little attempt to examine saving habits through a discriminating function, especially covering its relation with demographic factors. The current research analyzes the same through a discriminant analysis using saving habits as dependent variables which is further categorized into low, medium and high.

3 | RESEARCH DESIGN AND METHODS

In the present study convenience sampling has been used and samples have been drawn from the population of Punjab, Himachal Pradesh and Haryana of India. The

questionnaire was piloted by 10 academicians and 7 practitioners. As per the advice received from these experts some questions were modified. The questionnaire has been divided into three segments viz. demographic factors, investment decisions and financial literacy among investors. The questionnaires were filled by retail investors'. List of investors was obtained from the brokerage firms. Executives and managers of these firms were requested to distribute the questionnaires. In the present study, data have been collected of retail investors from three states of north India, that is, Punjab, Himachal and Haryana through a structured questionnaire. In all 200 questionnaires were distributed to investors and 118 filled questionnaires were received. An effective response rate was around 59% of the sample.

In recent years the technique of multiple discriminant analysis (MDA) has been widely used in both theoretical and application oriented marketing studies (Sanchez, 1974). In structured questionnaire investors, investors are asked to tick their saving on monthly basis. There have been three categories of saving. Later, Retail investors' have been categorized into three groups, high, medium and low, based the amount they save on monthly basis out of their total income. Discriminant analysis was performed to identify the variables that are relatively better in discriminating between high, medium and low amount saved by different retail investors. Through discriminant analysis high, medium and low investors can be differentiated on the basis of gender, age, marital status, education level, occupation, age, having financial advisors and income of investors. In the MDA, if there are G -groups, $G-1$ discriminant functions can be created, if the number of explanatory variables is larger than this quantity. In other words, in a discriminant problem with k explanatory variables and G groups, it is possible to create either $G-1$ or K discriminant functions, whether has lesser value (Bajpai, 2011). In the present study there are three groups and seven explanatory (predictors variables). Thus smaller of $7-1$ or 6 , that is two discriminant functions will be created.

In Figure 1 Y is qualitative dependent variable and $X_1, X_2, X_3, \dots, X_n$ are quantitative variables. Usually in multiple linear regression analysis, Y is also quantitative variable. But in MDA, Y is qualitative variable, because

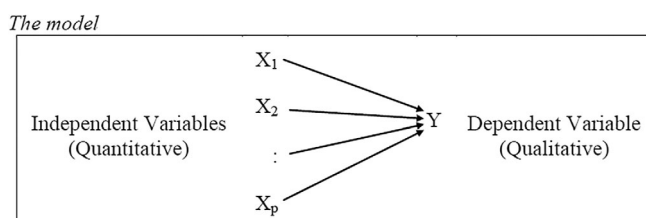


FIGURE 1 Discriminant analysis

this variable is categorized in different groups. Y is reflecting three categories of investors (low, medium and high). First category is low saving group, second category medium saving group and third category high saving group (Figure 1).

The discriminant equation:

$$Z = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_p X_p + \varepsilon \quad (1)$$

where, Z is a latent variable formed by the linear combination of the dependent variable, X_1, X_2, \dots, X_p are the p independent variables, ε is the error term and $\beta_0, \beta_1, \beta_2, \dots, \beta_p$ are the discriminant coefficients.

In the present study, the following model equation can be formed:

$$\begin{aligned} Z = & \beta_0 + \beta_1(\text{Gender}) + \beta_2(\text{Age}) + \beta_3(\text{Marital status}) \\ & + \beta_4(\text{Education level}) + \beta_5(\text{Occupation}) \\ & + \beta_6(\text{Financial advisors}) + \beta_7(\text{Annual income}) \end{aligned} \quad (2)$$

Further, multiple discriminant model equation can be redefined in following way:

$$Z_{ik} = b_{0i} + b_{1i} \times X_{1k} + b_{ji} \times X_{jk}. \quad (3)$$

Z_{ik} = Discriminant score of discriminant function i for object k . $i = 1, \dots, G-1$. X_{jk} = Independent variables j for object k , $J = 1, 2, \dots, J$. b_{0i} = Constant for discriminant function i . b_{ji} = Discriminant weight for independent variable J and discriminant function i .

In the present study, there are seven independent or explanatory variables (X_{jk}). These variables have been already elaborated in Equation (2). Investors' have been categorized in three groups (1—Low, 2—Medium and 3—High). In the present study, there will be two discriminant functions as already explained.

4 | ANALYSIS AND INTERPRETATION

This segment of paper deals with analysis and interpretation. At the beginning of this section descriptive statistics of three groups of investors are analysed. Then a correlation matrix of various explanatory variables and tests of equality of group means are explained. Later, canonical correlation and discriminant functions are calculated and analysed. At the last part, scores of two discriminant functions are calculated and interpreted.

Table 1 reports the group statistics of three categories of investors as specified earlier. There are more number

TABLE 1 Group statistics

Save annually		Mean	SD	Valid N (list wise)	
				Unweighted	Weighted
1 (Low)	Gender	1.48	0.503	71	71.000
	Age	1.39	0.727	71	71.000
	Marital status	1.42	0.497	71	71.000
	Educational level	2.85	0.364	71	71.000
	Occupation	2.01	0.431	71	71.000
	Financial advisor	1.80	0.401	71	71.000
	Annual income	1.28	0.565	71	71.000
2 (Medium)	Gender	1.15	0.364	33	33.000
	Age	1.70	0.810	33	33.000
	Marital status	1.15	0.364	33	33.000
	Educational level	2.94	0.242	33	33.000
	Occupation	1.91	0.292	33	33.000
	Financial advisor	1.73	0.452	33	33.000
	Annual income	1.79	0.740	33	33.000
3 (High)	Gender	1.36	0.497	14	14.000
	Age	1.86	0.949	14	14.000
	Marital status	1.21	0.426	14	14.000
	Educational level	2.93	0.267	14	14.000
	Occupation	2.00	0.000	14	14.000
	Financial advisor	1.79	0.579	14	14.000
	Annual income	2.36	0.842	14	14.000
Total	Gender	1.37	0.486	118	118.000
	Age	1.53	0.792	118	118.000
	Marital status	1.32	0.469	118	118.000
	Educational level	2.88	0.325	118	118.000
	Occupation	1.98	0.369	118	118.000
	Financial advisor	1.78	0.436	118	118.000
	Annual income	1.55	0.746	118	118.000

Source: Authors calculations.

of low income saving investors (71) followed by medium (33) and high income saving investors (14). In low income saving group number of males is as compared to females is low. One is assigned for males and two for females. The average value is 1.48. One is assigned for age group of 25–35 years, two for 35–45 years and three for 45 years and above. There are higher investors in the age group, 25–35 years. The average age of 25–35 years group is 1.39. Education level has also been categorized in three parts, where one is for matriculates, two for undergraduates and three for post-graduates. In low saving group, the average score for education level is 2.84. Majority of respondents in the low saving group are post graduates or above. There are two categories of occupation (1-Business and 2-Salaried). The average score of

occupation is 1.91 which means that more number of investors belong to the second category, that is, salaried class. Investors are divided in two categories for financial advisors (1-Yes and 2-No). Majority of investors in low saving group do not have financial advisors. There are three levels of annual income for selected retail investors (1-Below Rs. 500,000, 2-Rs. 500,000 to Rs.1,000,000; 3-Above Rs. 1,000,000). The average value of annual income for low saving group is 1.79. Maximum numbers of investors are in the income group of Rs. 500,000 to Rs. 1,000,000.

As compared to first category (low saving group), the second category (medium saving group) has more number of males as average value of gender is 1.15. Age is also quite higher for medium saving group as compared to the

low saving group. Average age of second group is 1.86. Education level is almost similar in first and second group. In medium saving group, maximum people are in salaried class. Majority investors do not have financial advisors just like the first category of investors'. Annual income is quite higher for medium saving investors as compared to low saving group. Majorly respondents are married in both the first as well as the second group.

Third category of investors' belongs to high saving group. Their age and annual incomes are quite higher as compared to first two categories (low and medium). There is no significant difference in education level of high saving group people as compared to medium saving group. Majority of investors' are postgraduates or above. In high saving category, only salaried class employees are there. Majority of investors in this category too do not have financial advisors. Most investors in this group are married.

For the sample as a whole, male respondents outnumbered females. Majority of them were post-graduates or above. There was dominance of age category of 35–45 years. Majority of respondents were married; belonged to salaried class; and did not have financial advisors.

Table 2 shows the correlation coefficients of the seven explanatory variables. Gender has a negative correlation with age; annual income; and marital status of retail investors. Age the second explanatory variable has a negative association with marital status; gender; education level; and financial advisor. Age has a positive correlation with annual income (0.371) and occupation (0.202). Marital status is showing a negative association with age, gender, occupation and annual income. Education level of investors is also negatively associated with financial advisors. Education level is positively correlated with

occupation (0.216). Occupation is negatively associated with annual income and marital status; but has a significant positive correlation with age (0.202). Annual income of retail investors is demonstrating negative correlation with all explanatory variables except for age and education level. Annual income has a significant positive correlation with age (0.371).

Table 3 reports the results of tests of equality of group means. In this table Wilks' Lambda and F value are shown along with p value. Wilks' lambda is a test statistic used in multivariate analysis of variance (MANOVA) to test whether there are differences between the means of identified groups of subjects on a combination of dependent variables. Wilks' lambda statistic can be transformed (mathematically adjusted) to a statistic which has approximately an F distribution. This makes it easier to calculate the p value. Authors will present the F value and degrees of freedom, as in the present table, rather than giving the actual value of Wilks' lambda (Bartlett, Simonite, Westcott, & Taylor, 2000).

Three explanatory variables gender, marital status and annual income have p value less than .05. F value of these variables is quite higher. Higher F value and p value <.05 signifies that there is a significant difference in group means of all these variables. The other variables namely, age, education level, occupation and financial advisors have p value >.05. It means that there is not significant difference in group means of all these variables.

Table 4 reports summary of canonical correlation discriminant functions. As shown in the table, for the first function associated Eigen value is 0.381 and this function contributes 74.9% of the explained variance. For the second function, associated Eigen value is 0.128 and this function contributes 25.1% of the explained variance. The

TABLE 2 Correlation matrix

Pooled within-groups matrices								
		Gender	Age	Marital status	Educational level	Occupation	Financial advisor	Annual income
Correlation	Gender	1.000	-0.052	-0.049	0.168	0.099	0.048	-0.179
	Age	-0.052	1.000	-0.365	-0.083	0.202	-0.016	0.371
	Marital status	-0.049	-0.365	1.000	0.010	-0.205	0.084	-0.218
	Educational level	0.168	-0.083	0.010	1.000	0.216	-0.057	0.083
	Occupation	0.099	0.202	-0.205	0.216	1.000	0.020	-0.105
	Financial advisor	0.048	-0.016	0.084	-0.057	0.020	1.000	-0.148
	Annual income	-0.179	0.371	-0.218	0.083	-0.105	-0.148	1.000

Source: Authors calculations.

TABLE 3 Tests of equality of group means

	Wilks' lambda	F	df ₁	df ₂	Sig.
Gender	0.912	5.523	2	115	.005**
Age	0.949	3.074	2	115	.050*
Marital status	0.929	4.421	2	115	.014*
Educational status	0.981	1.120	2	115	.330
Occupation	0.984	0.925	2	115	.399
Financial advisor	0.994	0.335	2	115	.716
Annual income	0.753	18.855	2	115	.000***

Source: Authors calculations. * $p < 0.01$; ** $p < 0.05$; *** $p < 0.010$.

TABLE 4 Summary of canonical correlation discriminant function

Eigen values				
Function	Eigen value	% of Variance	Cumulative %	Canonical correlation
1	0.381 ^a	74.9	74.9	0.525
2	0.128 ^a	25.1	100.0	0.337

Source: Authors calculations.

^aFirst two canonical discriminant functions were used in the analysis.

TABLE 5 Discriminant functions and Wilks' lambda

Test of function(s)	Wilks' lambda	Chi-square	df	Sig.
1–2	0.642	49.661	14	0.000*
2	0.887	13.488	6	0.036**

Source: Authors calculations. * $p < 0.01$; ** $p < 0.05$.

first function has higher Eigen value as compared to second function. So, first function may be considered superior over the second function. Canonical correlation analysis studies the linear relation between two sets of variables. It is the multivariate extension of correlation analysis (Tabachnick & Fidell, 1989). The term can also be found in canonical regression analysis and in multivariate discriminant analysis (Statistics Solution, 2018). For the first function and second function associated canonical correlation are 0.525 and 0.337.

For testing the null hypothesis of equal group centroids, both functions should be considered together. Table 5 shows the value Wilks' Lambda along with Chi-square and p value. In the first column of Table 5, that is, test of functions, Column 1–2 show that no function has been removed. The associated Wilks' Lambda and Chi-square values are 0.642 and 49.661 (with 14° of freedom) respectively. The corresponding p value is significant ($<.05$), this indicates that two functions taken together significantly discriminate among three groups (low, medium and high). First column of second row of Table 5 reflects that when first function is removed, the Wilks' Lambda and Chi-square values associated with

second function are 0.887 and 13.488 respectively at six degrees of freedom. Again p value of second function is less than .05, so this value is also significant. This indicates that second function also significantly contributes to group differences.

Table 6 shows the standardized canonical discriminant function coefficients. These coefficients will be used to calculate the discriminant score (Z score) for a given case. The score is calculated in the same way as we calculate in linear regression, using the standardized coefficients and the standardized explanatory variables. In the present study, gender, age, marital status, educational level, occupation, financial advisor and annual Income are the variables created by standardizing our discriminating variables. Then, for each case, the function scores would be calculated using the following equations:

$$\begin{aligned} \text{Discriminant_Score_1} = & -0.317 (\text{Gender}) + 0.025 (\text{Age}) \\ & -0.309 (\text{Marital Status}) + 0.253 (\text{Education Level}) \\ & -0.157 (\text{Occupation}) + 0.077 (\text{Financial Advisors}) \\ & + 0.738 (\text{Annual Income}) \end{aligned}$$

TABLE 6 Standardized canonical discriminant function coefficients

	Function	
	1	2
Gender	-0.317	0.684
Age	0.025	-0.176
Marital status	-0.309	0.505
Educational status	0.253	-0.406
Occupation	-0.157	0.497
Financial advisor	0.077	0.153
Annual income	0.738	0.812

Source: Authors calculations.

TABLE 7 Structure matrix

	Functions	
	1	2
Annual income	0.897 ^c	0.406
Marital status	-0.422 ^a	0.266
Age	0.374 ^a	0.038
Educational status	0.218 ^a	-0.106
Gender	-0.405	0.512 ^a
Occupation	-0.142	0.256 ^a
Financial advisor	-0.091	0.144 ^a

Note: Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions. Variables ordered by absolute size of correlation within function.

^aLargest absolute correlation between each variable and any discriminant function.

Source: Authors calculations.

$$\begin{aligned} \text{Discriminant_Score_2} = & 0.684 (\text{Gender}) - 0.176 (\text{Age}) \\ & + 0.505 (\text{Marital Status}) - 0.406 (\text{Education Level}) \\ & + 0.497 (\text{Occupation}) + 0.153 (\text{Financial Advisors}) \\ & + 0.812 (\text{Annual Income}) \end{aligned}$$

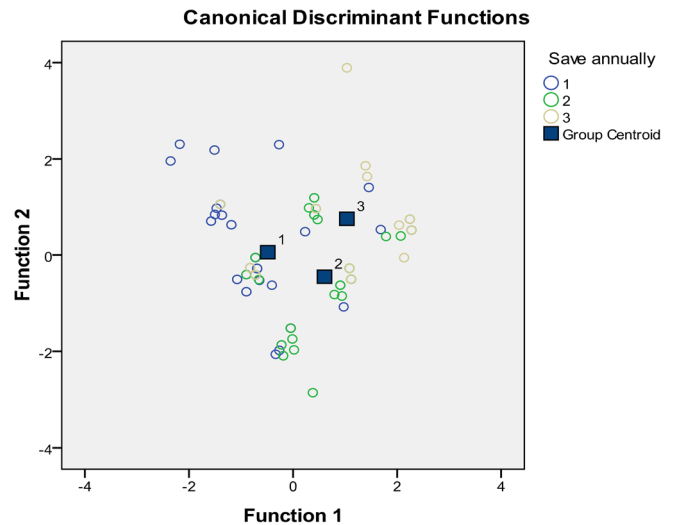
The distribution of the scores from each function is standardized to have a zero mean, and one *SD*. The magnitudes of these coefficients indicate how strongly the discriminating variables affect the score. It can be seen that the standardized coefficients for annual income (0.738) in the first function are greater in magnitude than the coefficients for the other six variables. Thus, annual income will have the greatest impact on the first discriminant score. Similarly standardized coefficients in function two of annual income (0.812), gender (0.684), marital status (0.505) and occupation (0.497) are higher as compared to other three explanatory variables. Thus these

TABLE 8 Unstandardized canonical discriminant functions

Save annually	Function	
	1	2
1 (Low)	-0.486	0.058
2 (Medium)	0.606	-0.445
3 (High saving)	1.035	0.753

Note: Unstandardized canonical discriminant functions evaluated at group means.

Source: Authors calculations.

**FIGURE 2** Canonical discriminant functions [Colour figure can be viewed at wileyonlinelibrary.com]

four variables will have high impact on the second function discriminant score.

Structure matrix (Table 7) exhibits within group correlation for each explanatory variable with canonical function. An asterisk mark associated with each variable shows its highest absolute correlation with one of the function. Annual Income (0.897*) has the highest correlation with function one. Marital status has negative association (-0.422) in function one, this is followed by gender (-0.405). Financial advisor (-0.091) has the lowest negative association with function one.

Gender (0.512*), annual income (0.406) and marital status (0.266) have strong positive correlation with function two, while education level (-0.106) has the lowest negative correlation. Age (0.038) has the lowest positive correlation in function two.

Table 8 reports the functions at Group Centroids for combined groups for discriminant analysis. The centroid is the concept used in multivariate analysis for mean. Just like the mean, the centroid of a cloud of points minimizes the sum of the squared distances from the points of the

cloud to a point in the space (Abdi, 2009). Functions at Group Centroids are the means of the discriminant function scores by group for each function calculated. If scores of the first function for each group are calculated and then the means of the scores by group, it is reflected that the low saving retail investor group has a mean of -0.486 , the medium saving group has a mean of 0.606 , and the high saving group has a mean of 1.035 . The function scores have a mean of zero, and we can check this by looking at the sum of the group means multiplied by the number of cases in each group: $(71 \times -0.486) + (33 \times 0.606) + (14 \times 1.035) = 0$. Similarly for second function these three groups (low, medium and high) have mean 0.058 , -0.445 and 0.753 and respectively. So the sum of group means will be $(71 \times 0.058) + (33 \times -0.445) + (14 \times 0.753) = 0$.

It is already stated that group represents those investors who save low amount, group two save medium amount and group three save high amount on monthly basis. It is clearly visible that group three has the highest

value (1.035) in function one and function two (0.753). Group one has the lowest value in function two (0.058) and has comparatively high value in function one. Group two has highest value in function one (0.606).

Figure 2 reports the combined group plot for MDA. It depicts that group three has the highest value in function one and two. Whereas group two has high value in function one. Group one has the lowest value in function two.

Figure 3 depicts the territorial map of MDA. In this map, group centroid is shown by asterisk. In a map, numbers corresponding to groups are spread to show group confines. Group one centroid is symbolized by numeral 1 and group two centroid is represented by 2; and group three by 3.

5 | CONCLUSION AND DISCUSSION

The present study is undertaken to investigate whether investors who invest low, medium and high amount can

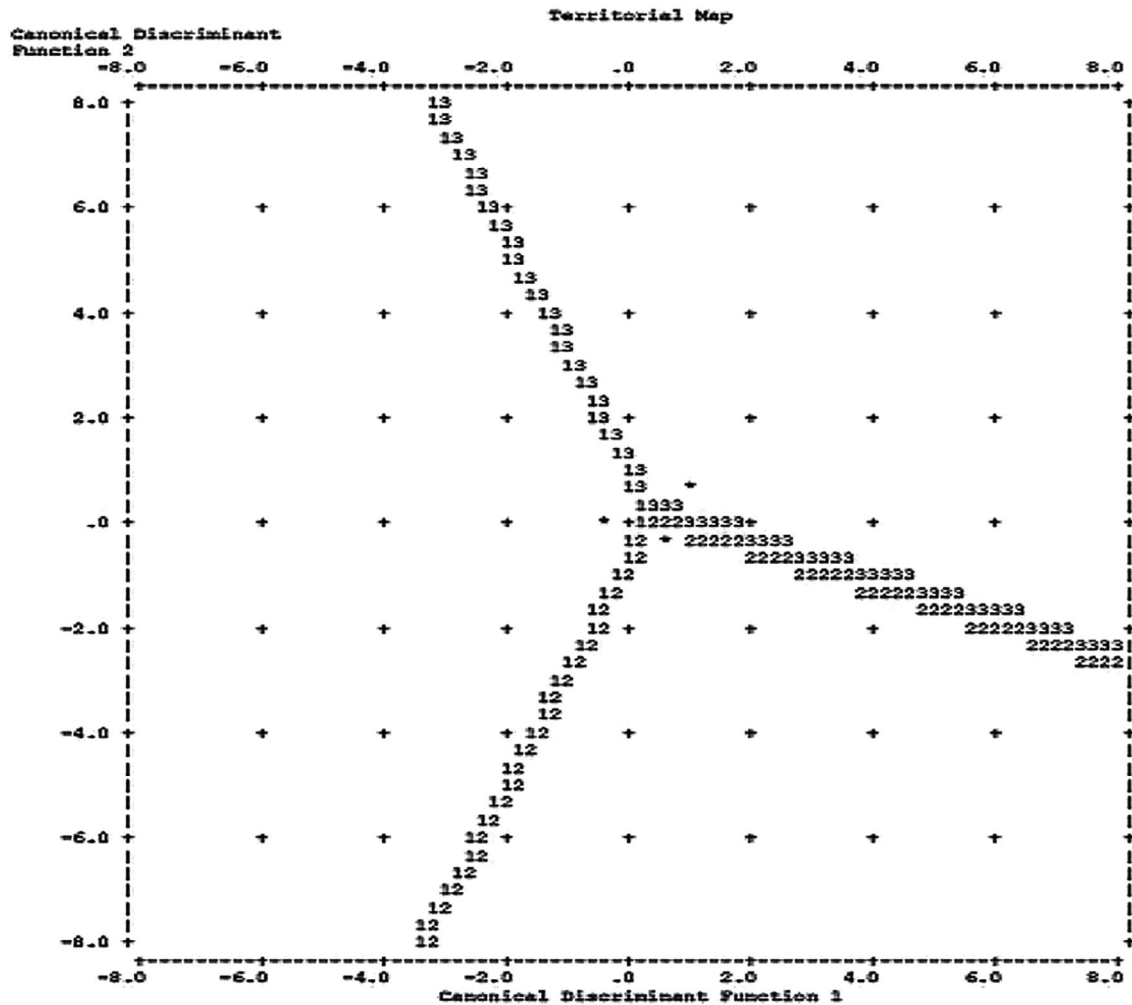


FIGURE 3 Territorial map of multiple discriminant analysis (MDA)

be discriminated on the basis certain demographic factors. These three categorical variables are used as dependent variables and various demographic factors namely, gender, age, annual income, occupation, education level, having financial advisors and marital status are used as explanatory variables. Descriptive statistics of categorical variables reflects that saving habits of retail investors according to age, gender, marital status and annual income of selected retail investors. There are three categorical variables, so two discriminant functions are created and both are found to be significant at 5% level. Tests of equality of group means reflects that four explanatory variables age, gender, marital status and annual income have significant difference in their group means. The magnitudes of these coefficients indicate how strongly the discriminating variables affect the score. In first discriminant function coefficients of annual income are greater in magnitude than the coefficients for the other six variables.

Thus, annual income will have the greatest impact on the first discriminant score. Similarly standardized coefficients in function two, viz. annual income, gender marital and occupation are higher as compared to other three explanatory variables. Thus, these four variables will have high impact on the second function discriminant score. Classification results, canonical correlation and Wilks' Lambda test confirm statistical significance of research results. Outcomes of this study will guide policymakers, financial institutions and bankers, as to which factors they need to focus on in order to develop successful strategies to promote saving and investment habits among retail investors. Insights from this research will help financial institutions and policy makers to plan and formulate strategies while keeping in mind the factors highlighted by the study.

Studies by (Achar, 2012; Bhardwaj, Raheja and Priyanka, 2011; Jain & Jain, 2012; Virani, 2012) support that saving pattern of salaried class families depends upon income of both husband and wife's salary, but as the salaries are different so the saving patterns are also different. People save for children's education, marriage and for security after retirement. Gupta (1970) highlights that in India in rural areas people save less, in comparison to urban populace. Aggregate saving ratio has directly affected a number of demographic variables (Diamond & Vartiainen, 2007; Sturm, 1983). According to (Carroll & Samwick, 1997; Huggett & Ventura, 2000; Lea, Tarpy, & Webley, 1987; Lunt & Livingstone, 1991) people who have higher income save regularly or save a higher proportion of their income.

Insights from this research will help financial institutions and policy makers to plan and formulate strategies while keeping in mind the factors highlighted by the study.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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