CHAPTER III

RESEARCH METHODOLOGY

The research methodology followed in search of the achievement of the research objectives is detailed in this Chapter. Research methodology is a systematic plan to conduct a research (Chandra and Hareendran, 2018). It discusses the sampling design, conceptual framework of the research, and operational definition of concepts. It further discusses and analyses the details of research instrument, framework of analysis and hypotheses testing, justify the methods selected and analyses the contribution of the thesis as a whole. This chapter is divided into various sub headings as presented below:

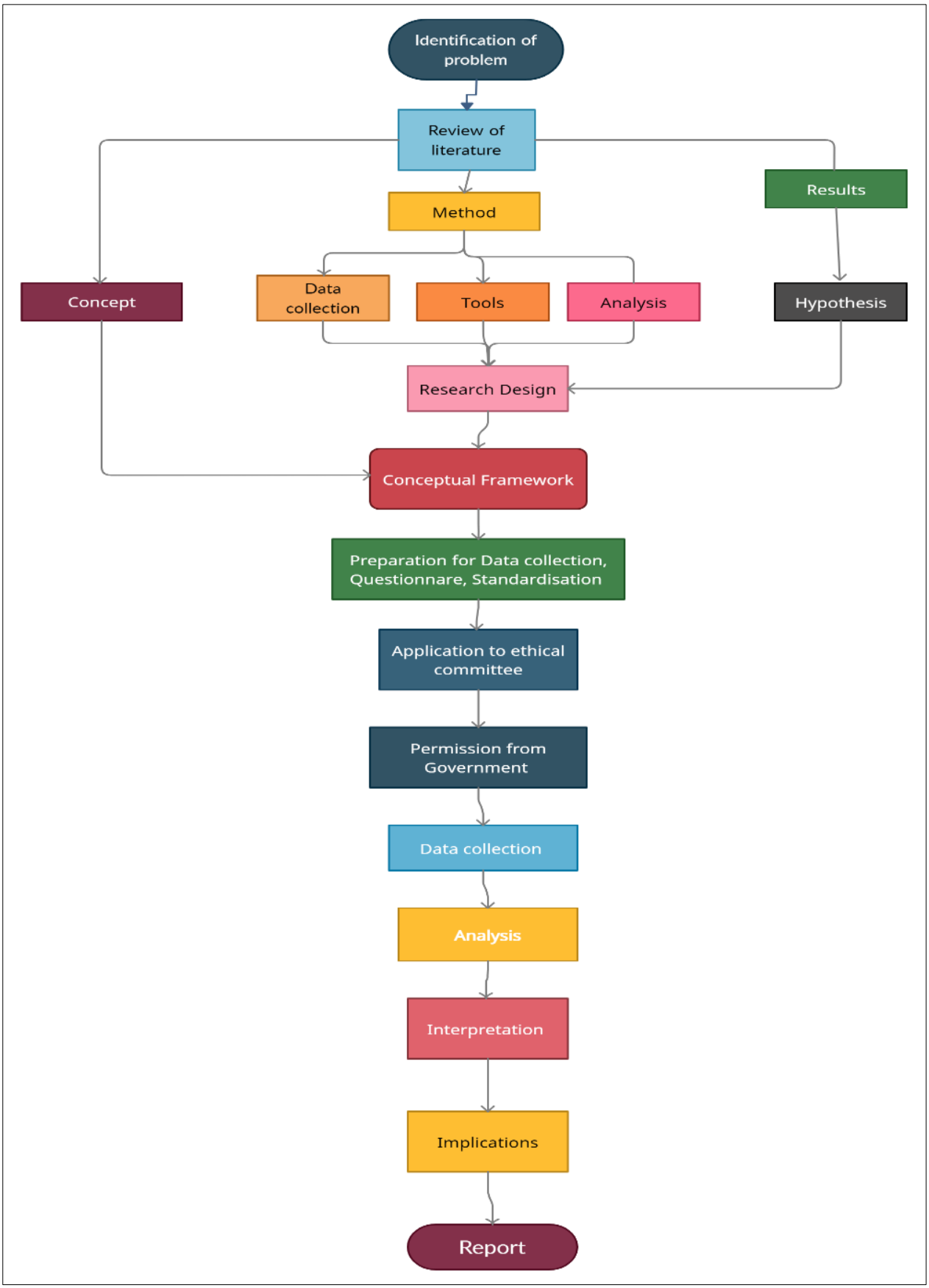
3.1.RESEARCH DESIGN

The descriptive research design is used in the study. Descriptive research design is used to describe systematically or accurately the facts and characteristics of a given population and to discover associations or relationships between or among the selected variables (Dulock, 1993). Both primary and secondary data is to be used for the study. The secondary data for the study were collected from published reports and websites, books, magazines, and newspapers. The conceptual research structure is portrayed below. Kerala is the geographical area for the study because there are a majority of population is middle class people. The investment behaviour of middle-class people is intended to be studied here. Using a structured questionnaire, the primary data were collected from Government employees in Kerala.

The research process is portrayed in the diagram below.

Figure 3.1

Research flow chart



3.2. SAMPLE DESIGN

3.2.1. Population

Govt. employee are the employees who receive salary by using SPARK (Service and Payroll Administrative Repository for Kerala) and are appointed as public servant or appointed as teachers and employees at aided educational institutions. SPARK is an employee management information system which started to enhance the efficiency and effectiveness and transparency of human resources management in government and it is a project proposed by the National Informatic Center (NIC). Now its service is used by more than five lakh employees from one hundred and twenty departments under government of Kerala. There are four grades among government employees. Here the research considered and studied about the investment behaviour of grade II employees. The grade II employees are the officers with basic pay more than Rupees 39300 and below 70000. Grade II employees are of two types gazetted officers and non-gazetted officers. They are termed as Grade II(a) and Grade II(b) employees.

Table 3.1.

Categories and Grade of Kerala State Government Employees

CRITERIA FOR DIVISION	
GRADE	All officers who draw an actual basic pay of INR.
Grade I	70,000 and above
Grade II (a)	59,300 and above but below 70,000
Grade II (b)	39,300 and above but below 59,300
Grade III	25,100 and above but below 39,300
Grade IV	below 25,100

Source: 11th Pay Revision Report 2021

Government employees represent all the sections of society. The appointments of government employees are done by the Kerala public service commission based on the reservation rules. The unit of appointments for this purpose is twenty and half the appointments (10) is from open merit. From this twenty appointments, scheduled castes and scheduled tribes have reservation of two posts. For eight appointments shall be reserved for the other backward community and remaining. There is a rotation chart for the appointments. As per this, one from the reservation category and one from the open

community category, thus 50 percent from each category. The backward classes are included eight categories like Ezhava/Billava/Thyya (EBT), Muslims (M), Latin Catholic or Anglo Indian (LC/AI), Nadar(N/SIUC), SC converted to Christianity, Dheevara (D) and Other Backward Classes (OBC).

Table 3.2.

Social categories of Kerala State Government Employees – Open and Reservation Quota

Category	% of reservation
Open Competition	50.00
Ezhava/Billava/Thiyya	14.00
Muslim	12.00
LC/AI	4.00
Vishwakarma	3.00
S.I.U.C Nadar	1.00
SC converts to Christianity	1.00
Dheevara	1.00
Hindu Nadar	1.00
Residual OBC	3.00

Source: Kerala Public Service Commission Website

3.2.2. Sample Size

A total of 5,15,639 government employees are working in Kerala; among them, 4,96,596 are paid from state government funds using SPARK. As per the state budget 2020-21, there are grade II employees of 44 per cent of the total employees. So, the population is about 2,18,502 grade II employees. Sample size is determined by Krejcie and Morgan model

Sample size = X^2 NP (1-P) ÷ d^2 (N-1) + X^2 P(1-P)

X^2 – the table value of chi-square for 1 degree of freedom at the desired confidence level

N –the size of Population

P – the population proportion

D – the degree of accuracy expressed as a proportion

Here the N is 2,18,502 and X^2 is the table value of chi-square for 1 degree of freedom at 0.05 confidence level; that is 3.84. P is assumed to be 0.5 and degree of accuracy expressed as a proportion is 0.05.

Thus, sample size = $3.84 \times 2,18,502 \times 0.5(1-0.5) \div (0.05)^2 \times (2,17,567-1) + 3.84 \times 0.5 \times (1-0.5)$

The sample size is 384.

3.2.3. Sample Selection

Primary data have to be collected from Grade II Government employees in Kerala State government. There are in total 122 departments in Kerala. The Proportionate Stratified Random Sampling technique is used for the study, so as to have an adequate representation from each department.

Table 3.3.

Department Wise Classification of Kerala State Government Employees – Total Number of Employees and Number of Sample

Sl. No.	Departments	Number of total staff	% share of total staff	No. of Sample
1	General Education	1,68,751	32.73	126
2	Police	60,126	11.66	45
3	Health Service	36,384	7.06	27
4	Higher Secondary Education	29,738	5.77	22
5	Collegiate Education	22,547	4.37	17
6	Land Revenue	17,022	3.3	13
7	Medical Education	14,269	2.77	11
8	Judicial Service	14,013	2.72	10
9	Agriculture	9,234	1.79	7
10	Technical Education	8,825	1.71	7
11	Others (112 Departments)	1,34,730	26.13	100
	Total	5,15,639	100	384

Source: Government of Kerala (2019), Appendix I to the detailed budget estimates 2019- 20 – Details of Staff

Samples were collected equally from the three regions like North Kerala, South Kerala and Middle Kerala. North Kerala included the districts of Kasaragod, Kannur, Kozhikode Wayanad and Malappuram. Middle Kerala specifies the districts like Palakkad, Thrissur, Ernakulam and Idukki. South zone denotes Alappuzha, Kottayam, Pathanamthitta, Kollam and Thiruvananthapuram.

Figure 3.2

Research study area

Kerala – The Southern State of India

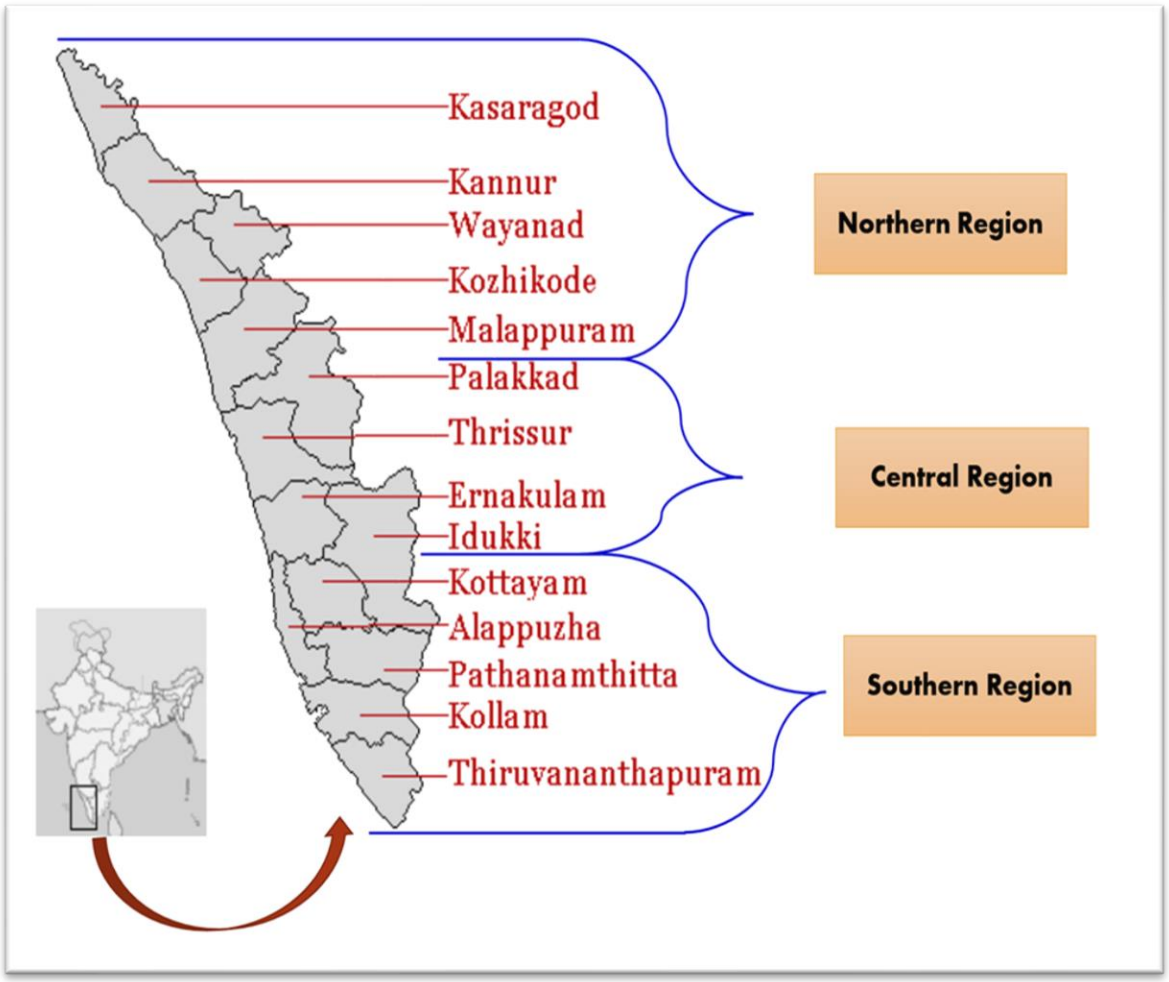


Table 3.4.

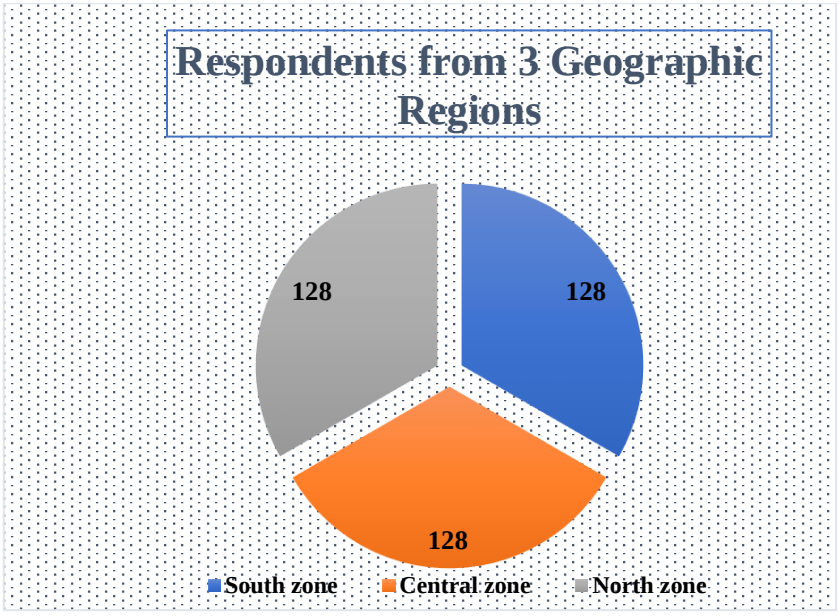
District Wise Classification of Sample Selection

Region	Districts	No of Samples	Total
North Zone	Kasaragod	25	**128**
	Kannur	26	
	Kozhikode	26	
	Wayanad	25	
	Malappuram	26	
Central Zone	Palakkad	33	**128**
	Thrissur	33	
	Ernakulam	33	
	Idukki	29	
South Zone	Alappuzha	25	**128**
	Kottayam	26	
	Pathanamthitta	25	
	Kollam	26	
	Thiruvananthapuram	26	
3 Regions	**14 districts**	**384 sample**	

Source: Primary data

Figure 3.3

Geographical area of sample

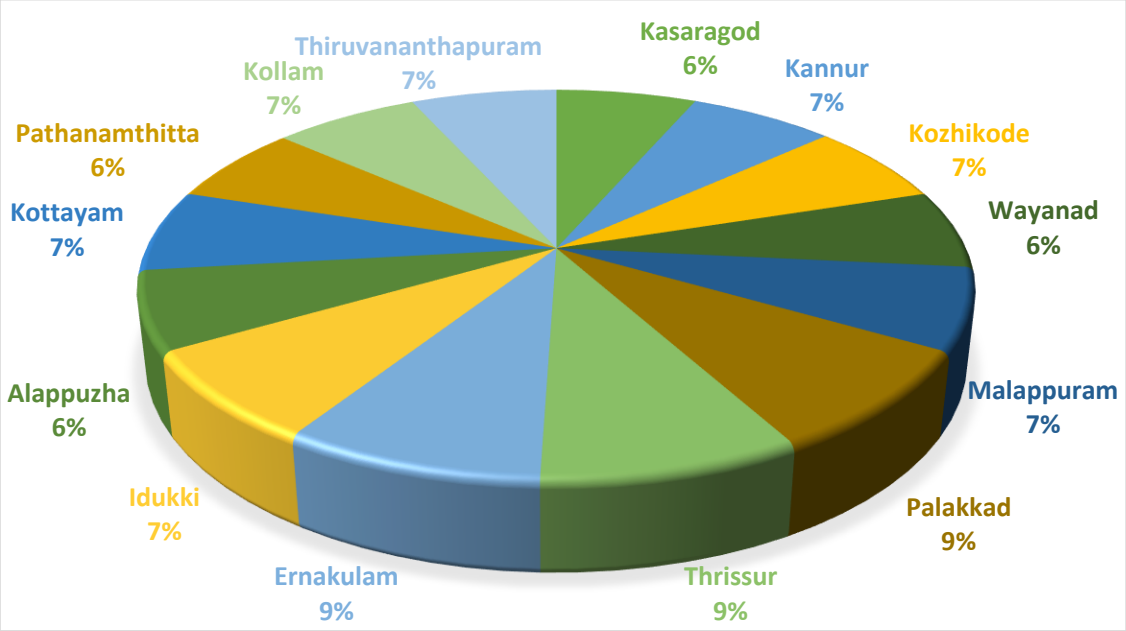


Source: Primary data

The respondents are equal; 33.33 percent from three different geographical areas like South, North and Central zones of Kerala.

Figure 3.4

District wise Distribution of Respondents



Source: Primary data

3.3.DEVELOPMENT OF CONCEPTUAL FRAMEWORK

Investment behaviour are studied in three dimensions investment pattern, investment preferences and investment decision making.

3.3.1. Investment Pattern

Investment pattern is the main focus of the investment behaviour of employees. This section discusses investment objectives, factors affecting investment, risk level perceived by the respondents, and actual investment made in different investment avenues.

3.3.1.1. Investment objectives

Investment objectives are studied from different reviews and selected objectives which are relevant in the Kerala scenario. The major objectives studied here are Good returns (Bishnoi, 2014), Capital Appreciation (Bishnoi, 2014), Liquidity (Bishnoi, 2014), Tax saving (Bishnoi, 2014), Children's education (Jothilingam, and Kannan, 2013), Future security (Sood, and Kaur, 2015) and Pension (Das, and Jain, 2014).

3.3.1.2. Perceived Factors in Investment

The factors affecting investment behaviour are studied from different reviews and selected eight factors. Then collected the perception of select government employees on these factors.

They are Return (Bishnoi, 2014), Safety (Sood, and Kaur, 2015), Liquidity (Bishnoi, 2014), Tax saving (Bishnoi, 2014), Diversification (Dhar, et al., 2017), Simplicity (Chandra, and Kumar, 2012), Affordability (Joshi, et al., 2011) and Marketability (Sultana, and Pardhasaradhi, 2012).

3.3.1.3. Risk level Perception

The perception of risk associated with different investment avenues is critical in their investment decisions. Perception is when a person seeks priority in clarification of sensory information, allowing the investor to make the final decision based on their knowledge and experience. The concept of 'risk level perception' indicates how investors view the risk of financial assets on their terms related to their worries and feelings. Risk perception is a belief, rational or irrational, on the risk by an individual, group or company. Investor risk perception is an essential factor in their investment decisions.

3.3.2. Investment Preferences

Investment preferences here mean the preferences of different investment avenues. Investment preferences are not to be confused by investment patterns and it is termed only as the person's mental state to select a particular investment avenue (SuriyaMurithi, Narayanan, & Arivazhagan, 2012). This is more personal and individualistic and may be affected by awareness, familiarity, risk perception, investment motives, and expected return (Neha, 2016). Here, the investigators want to study investment preferences and their relationship with intelligence, personality, risk perception, and investment behavioural biases.

3.3.2.1. Investment Avenues

The avenues here taken for study are the famous avenues in Kerala like Bank deposits, Post office deposits, Treasury savings, Chit Funds, NBFCs, Cooperative sector, Insurance, Real estate, Tax saving scheme, Commodity, Precious Metals, Stock Market, Mutual fund, and Debt Market.

- Bank Deposits

Bank deposits are the primary saving avenue used by the ordinary person and the most famous avenue (Gujar, 2021). It may include a savings account, recurring account, and term deposit. The term deposit is termed here as bank deposit.

- Post Office Deposits

Post office deposits are the next popular avenue, and they are now adding digital financial services. There are several special schemes available like KVP, MIS, NSC, PPF, and so on (Venkataiah, & Rao, 2018).

- Treasury Savings

Kerala Government employees are more familiar with treasury savings because of the government policy to encourage them to use treasury accounts. Like bank deposits, it includes different types of accounts (Gupta, 2021).

- Chit Funds

Chit funds are popular among government employees as they are more familiar with Kerala State Financial Enterprises Chits, a state-owned organization. They provide several types of chit funds in different denominations and periods (Irfan, & Santosh, 2023).

- Non-Banking Financial Companies (NBFCs)

Non-Banking Financial Companies (NBFCs) are registered companies engaged in the business of financial nature like loans and advances, insurance business, leasing, and acquisition of government bonds, stock, and securities (Sisodia, et al., 2005).

- Cooperative Sector Financial institutions

A cooperative financial institution is an organization owned and operated by its members who do financial business, like lending and insurance and act as agencies in investment. These institutions work under cooperative regulation, are controlled by the state government, and are treated as semi-government institutions (McKillop, 2020). Cooperative sector investment is prevalent in Kerala, and it is preferred in rural areas.

- Insurance

Insurance is primarily a risk management plan; hence, life insurance plans are considered a good investment plan for individuals, especially salaried persons. It may also help the employees to get tax benefits under the head deductions. There are different kinds of insurance plans and policies, and there are Unit Linked Insurance Plans also (Sakthivelu & Karthikeyan, 2023).

- Real Estate

Real estate is an investment opportunity that uses the management, ownership, rental, and buying and resale of property for profit (Venkataiah, & Rao, 2018). This avenue has a benefit

of appreciation in values over the years. Thus, it may help individuals with long term investments.

- Tax Saving Scheme

Tax saving schemes are investment schemes planned for getting the tax benefit by adhering to the Income-tax regulations. These schemes included the long term deposits in a bank, NSC VIIIth issue in Post office, Unit Linked Insurance Plans, Equity Linked Saving Scheme, and other similar schemes (Subramanian, 2022).

- Commodity

A commodity is a simple product used in trade that is substitutable with other goods of the same type. Traditional examples of commodities include agricultural products and natural goods. Commodities can also be classified as soft goods and hard goods. Hard goods are natural resources extracted from the earth, like metals and minerals. Soft goods include grains, sugar, livestock, and other farm products. Commodity trading through exchange and the derivative market is also included in this.

- Precious Metals

Investment in Precious metals like gold and silver is traditionally accepted in Kerala, and the demand for the metals was high compared to the market's availability. Traditionally, there is a demand for jewellery products, but it has turned into a demand for bars and coins through the ages (Subramanian, 2022). Now there are many opportunities for the financialization of gold, like the gold bonds and the Gold Monetization Scheme, including loans and deposits.

- Stock Market

The stock market is the secondary market of transferable securities and stocks that are issued by the corporates in the primary market. The financial assets like equity and debt here in this section are included only in the equity market, and the debt market is taken as another avenue (Goudar et al. 2022). The players in the market are inverters, hedgers, speculators, or arbitrageurs.

- Mutual Fund

A mutual fund is the pooling of funds from many investors and purchasing securities like stocks, bonds, gold, or any combination managed by a professional fund manager. The mutual fund is suitable for investors motivated to invest in the stock market but lacks knowledge, time, and a small amount to invest (Sakthivelu & Karthikeyan, 2023).

- Debt Market

Indian secondary Debt market is a part of the stock market like the equity market, which deals with corporate bonds and Government bonds. Company bonds are the debt securities issued by private and public companies to raise money for long term investment in assets. The role of individual investors is nominal in the debt market (Goudar et al. 2022). But banks, financial institutions, and corporates are the major players there.

3.3.3. Investment Decision Making

The defensive investor is one interested chiefly in safety plus freedom from bothering. They should be able to count on the current percentage of dividend return on their stock. The defensive investors are recommended to make a compromise policy that includes a significant part of bonds and equities in their portfolios (Graham, 1973). The conservative investor prioritises capital preservation than the market return. They depend more on long term past information for investment decision making. Common stocks may do better in future than in the past. Thus, an intelligent investor should deal with two-time investment results like the result in the long term and short or immediate future (Graham, 1973). An aggressive investor should start from the same base as a defensive investor: his division between bonds and common stocks bought at a reasonable price (Graham, 1973). After that, he should follow the investment pattern into more good quality tax-free bonds and less common stocks.

An aggressive or enterprising investor depends not on the amount of risk but in the amount of work he or she is willing to put in. He suggests varying the holdings of common stocks between 25 percent of minimum to 75 percent of maximum in inverse relationship to the market's action (Graham, 1973). The investors' decision happens with the help of both financial and psychological aspects of the investor. Investors' frame of mind, his/her hopes and apprehensions, his/her dissatisfaction and discontentment which he has done are all determined by his/her experiences from year to year (Graham, 1973). Psychologists have shown that most investors do a very poor job of predicting today how they feel about emotionally charged events in the future. When humans estimate the likelihood or frequency of an event has occurred, but how vivid the past examples are (Kahneman, & Tversky, 1979).

A serious investor is not likely to believe that the day to day or even monthly fluctuations of the stock market make them richer or poorer; but there is the role of psychological factors. According to Parag Parikh, the factors that push up investments are security, comfort, Leisure,

Love, Respect, and fulfilment. The characteristics that pull down from good investment decisions are laziness, greed, ambition, ignorance, vanity, and self-interest.

Crosby (2019) codified behavioural risk along with systematic risk and unsystematic risk. He found that some psychological risks lead to various modes of decision-making errors. He established four types of behavioural risk ego, conservatism, attention and emotion.

Ackert & Deaves (2011) focus on the way people make decisions with limited time and information in a world of uncertainty. They discussed the cognitive limitations which may lead to behavioural investment.

Investment decisions are made by investors using rational and logical thinking combined with irrational thinking. Here rational behaviour is termed as Prudence and irrational behaviour is termed as behavioural bias.

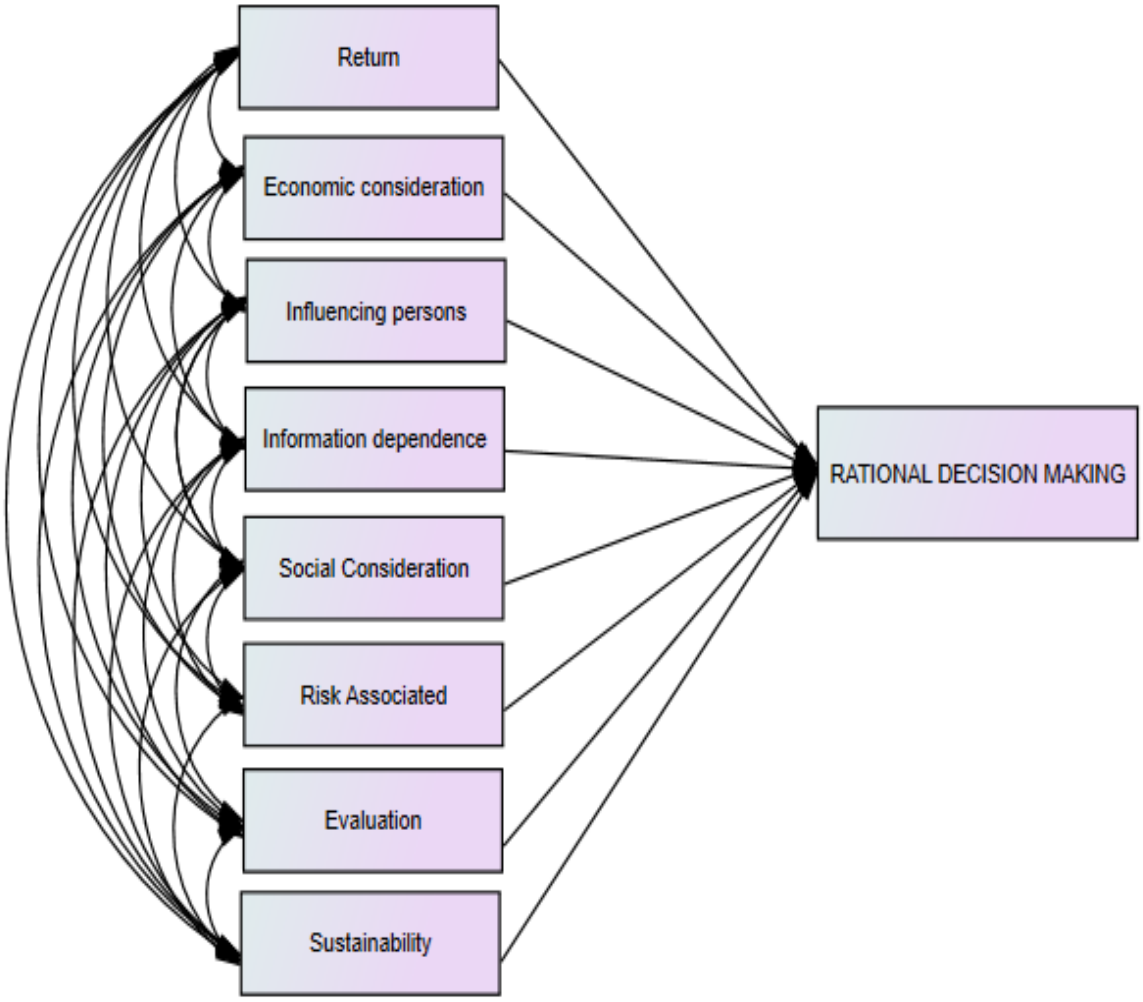
3.3.3.1. Rational Behaviour (Prudence)

The rational investment decisions are made by using the logical thought related to the following factors in investment like Return (Hunjra, et al.,2012, Bishnoi, 2014), Economic Consideration (Dhochak, and Sharma, 2012), Influencing Persons (Divanoğlu, & BAĞCI, 2018), Information Dependence (Alkaraan, and Northcott, 2013), Social Consideration (Berry, and Junkus, 2013), Risk (Dash,2010), Evaluation (Dhochak, and Sharma, 2016) and Sustainability (Tran, et al.,2020).

Figure 3.5

Rational Behaviour in Investment Decision Making

(Prudence)



Source: Compiled from Reviews of Related Researches

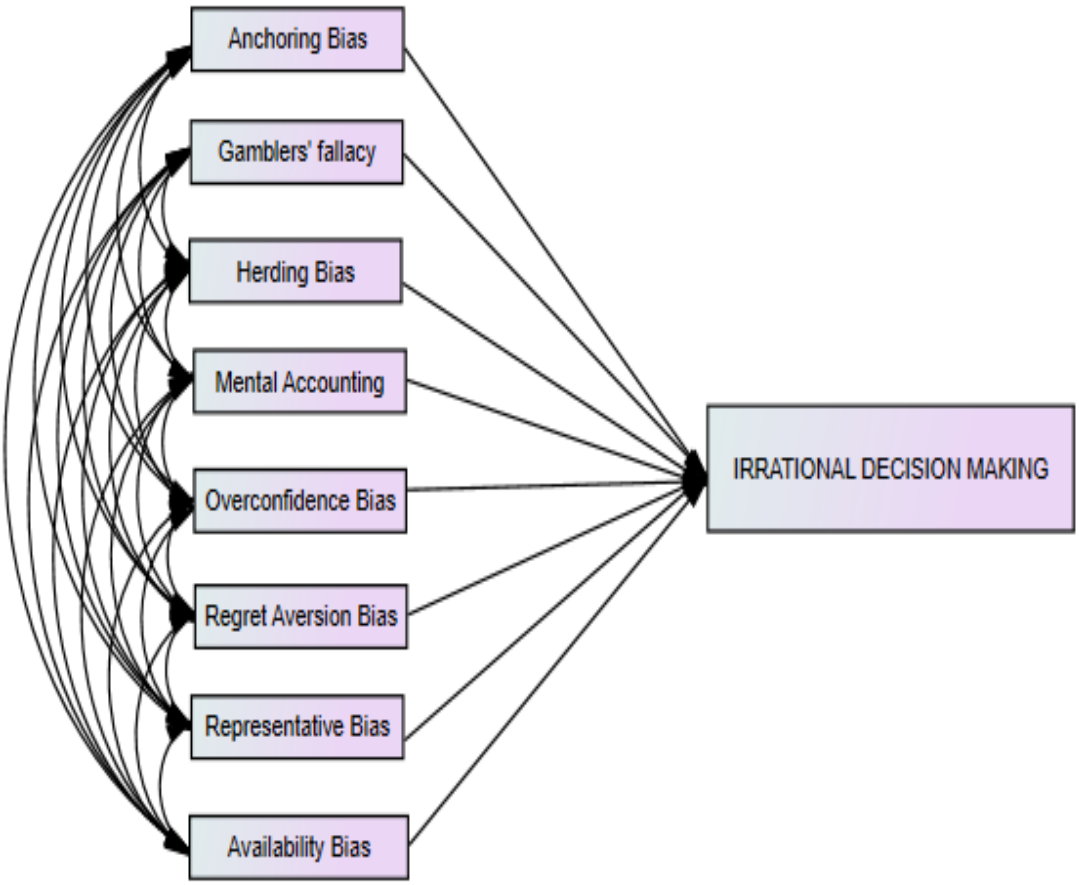
1.3.3.2. Irrational Behaviour (Behavioural Bias)

Biases are classified as Emotional bias and Cognitive bias. The heuristic or emotional bias includes Representativeness (Koti, 2019), Availability Bias (Kahneman and Tversky, 1972), Anchoring Bias (Ishfaq, and Anjum, 2015) and Gambler's Fallacy (Kartašova, 2013). The cognitive bias includes Overconfidence Bias (Qasim, et al., 2019), Mental Accounting Bias (Thaler, 1999), Herd Effect (Bikchandani and Sharma, 2001), and Regret Aversion (Benartzi and Thaler, 1995).

Figure 3.6

Irrational Behaviour in Investment Decision Making

(Behavioural Bias)



Source: Compiled from Reviews of Related Researches

Investment behaviour is the behaviour of the investor related to investment. The investment behaviour of the person depends on his or her knowledge about the investment and their behavioural aspects and cognitive aspects. The research study focusing on the psychological aspects like Intelligence and Personality and investment.

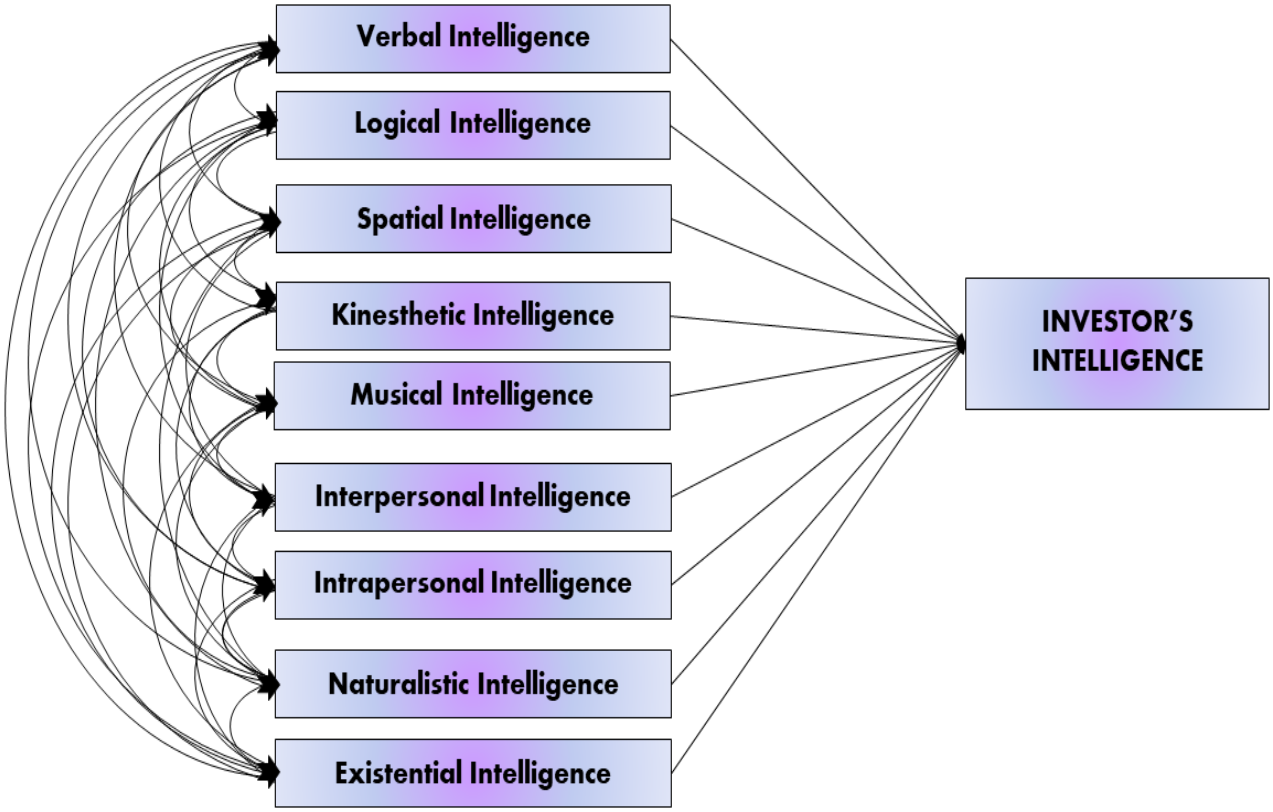
3.3.4. Investors' Intelligence

The Multiple Intelligence theory (Gardner, 1983) is taken for conceptual development and the nine different intelligences are considered for analysis. they are Linguistic/Verbal Intelligence

(Gardner,1983), Logical/Mathematical intelligence (Gardner,1983), Spatial Intelligence (Gardner,1983), Bodily/Kinesthetic Intelligence (Gardner,1983), Musical/Rhythmic Intelligence (Gardner,1983), Interpersonal Intelligence (Gardner,1993), Intra-Personal Intelligence (Gardner,1993), Naturalistic Intelligence (Gardner,1993) and Existential Intelligence (Gardner,2000).

Figure 3.7

Multiple Intelligence in Investors' Intelligence



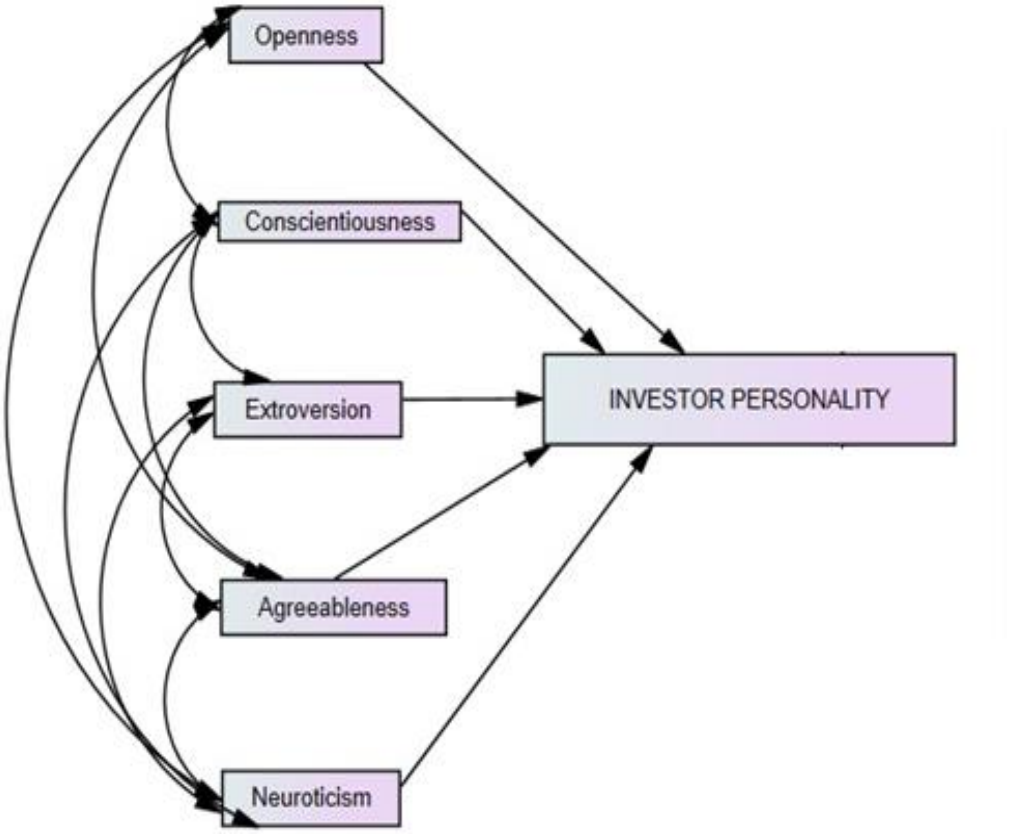
Source: Compiled from Reviews of Related Researches

3.3.5. Investors' Personality

Big Five Personality Traits (McCrae, and Costa, 1987) are included in conceptual framework. The five different personality traits identified are Openness (McAdams, 1992), Conscientiousness (Costa, and McCrae, 1999), Extroversion (McCrae, and Costa, 1987), Agreeableness (McCrae, and Costa, 1997) and Neuroticism (McCrae, and John, 1992).

Figure 3.8

Personality Traits in Investors' Personality

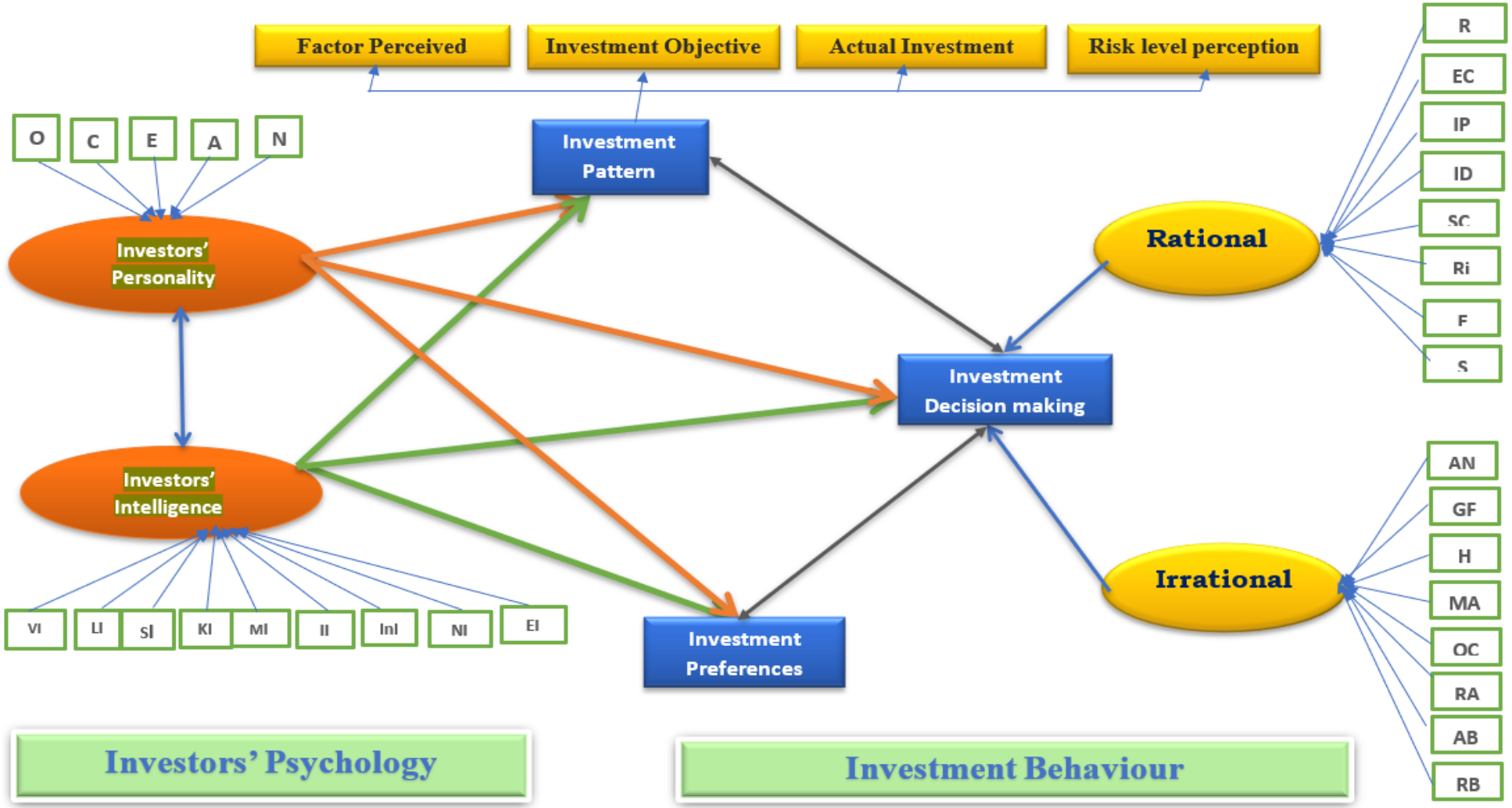


Source: Compiled from Reviews of Related Researches

On identifying the elements of investors' intelligence, investors 'personality, investment pattern, investment preferences, rational behaviour and irrational behaviour in investment and based on the theories referred, the conceptual framework of the study has been developed. The developed conceptual framework is given below as Figure 3.9.

Figure 3.9

Conceptual Framework for the study



Source: Compiled from Reviews of Related Researches

The conceptual model has included two independent variables like Intelligence of employees and personality traits of the employees which is part of the investor psychology. One dependent variable; Investment behaviour which includes Investment Pattern, Investment Preferences and Investment Decision making.

Intelligence have nine dimensions like Verbal, Logical, Spatial, Kinesthetic, Musical, Intra personal, Interpersonal, Naturalistic and Existential. Personality included five dimensions like Openness, Conscientiousness, Extroversion, Agreeableness and Neuroticism.

Investment patten have four dimensions like Factors, Objectives, Actual investment and Risk perception. Investment preferences included the preferences of fourteen different investment avenues.

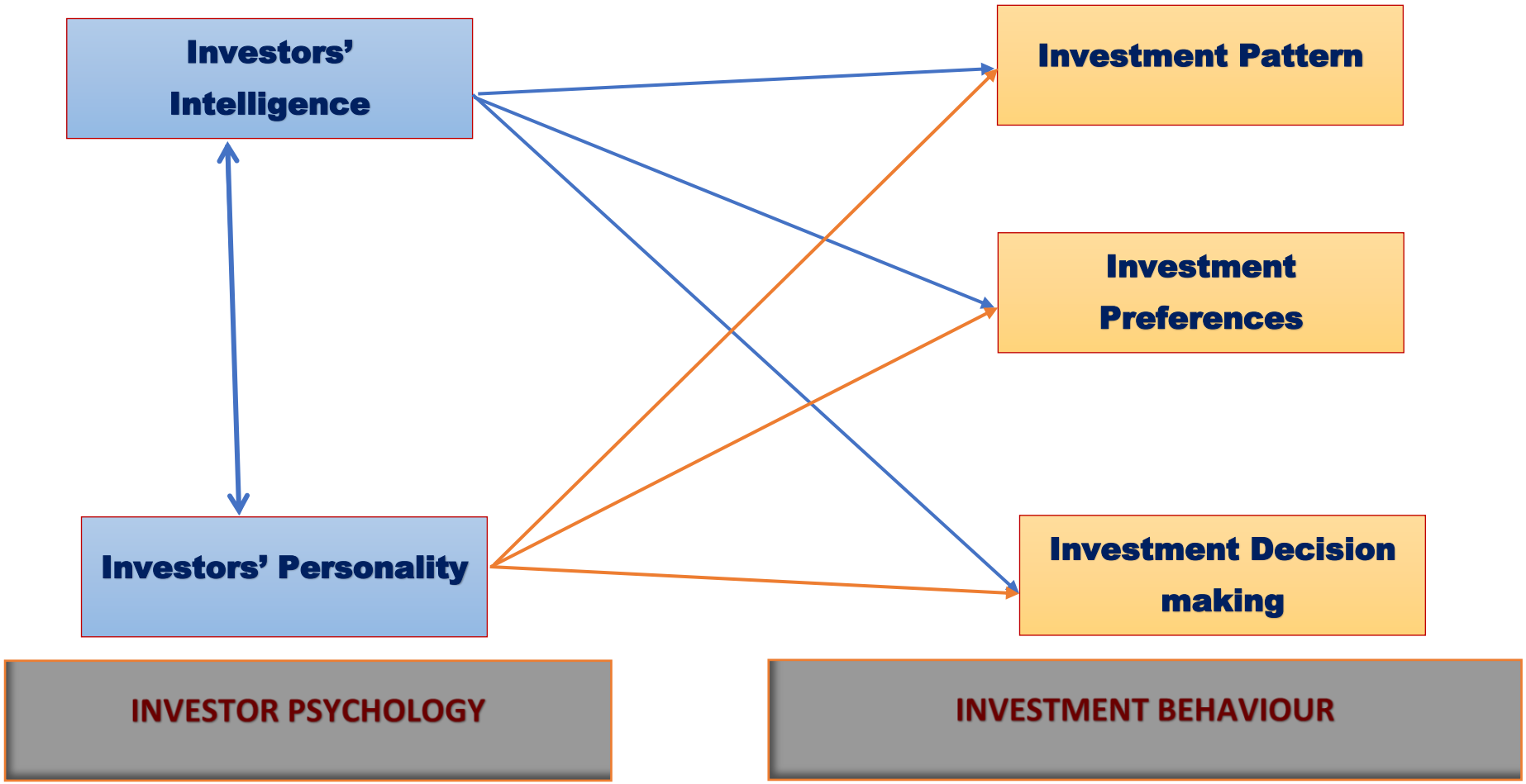
Rational Decision making have eight dimensions like Return, Economic consideration, Influencing Person, Information Dependence, Social consideration, Risk, Evaluation and Sustainability. Irrational Decision making have eight dimensions like Anchoring Bias, Gamblers' fallacy, Herd behaviour, Mental Accounting, Overconfidence, Regret Aversion, Representative bias and Availability bias.

The model is simplified according to the major objective; to analyse the investment behaviour of Government employees in relation to their cognitive and behavioural aspects like intelligence and personality. Confirmatory Factor Analysis (CFA) can decrease data dimensions and standardise the scale of various indicators. (Fan et al., 2016). The dimensions of different variables are reduced using CFA.

The simplified model is portrayed as figure 3.10.

Figure 3.10

Conceptual Framework for Direct Relationship



Source: Compiled from Reviews of Related Researches

3.4.OPERATIONAL DEFINITIONS

3.4.1. Investment

According to Cambridge dictionary, Investment is defined as 'the act of putting money, effort or time into something to make a profit or get an advantage, or money, effort or time." Here the Investment is treated as the act of putting money into different investment avenues to make a return.

3.4.2. Investment Behaviour

Investment behaviours are defined as how the investors judge, predict, analyse, and review the decision-making procedures, including investment psychology, information gathering, defining and understanding, research and analysis.

3.4.3. Investment Pattern

According to the Cambridge dictionary “Pattern is a particular way in which something is done or organised”. In Collins dictionary, "Pattern is the repeated or regular way in which something happens or is done.”

Here investment pattern is the particular repeated way an investment is made or done by the person. The factor perceived, objective, risk perceived, and selection of avenues are explicitly taken.

3.4.4. Investment Preference

As per the Oxford dictionary, "Preference is a greater liking for one alternative over another or others”.

Investment preference is a greater liking for one investment avenue over another or others. Here the investment preferences mean the preferences of different investment avenues.

3.4.5. Investment Decision Making

According to the Cambridge dictionary, Decision making is "making a choice after thinking about several possibilities."
Investment decision making is defined as the process of selecting a specific investment option from many options after using rational or irrational behaviour.

3.4.6. Investors' Intelligence

According to Wechsler, D. (1944), intelligence is the aggregate global capacity of an individual to act purposefully, to think rationally and act effectively with his environment. According to psychologists, there are several types of intelligence, and here the Multiple Intelligence theory of Gardner, H. (1983) is to be taken for the study. He defined Intelligence as a set of abilities, talents or mental skills. He argued that all individual human beings possess these skills, but they differ in the degree of skills and the nature of their combination. There are nine types of Intelligence as per the theory of Multiple Intelligences like Verbal, Logical, Musical, Spatial, Kinesthetic, Intrapersonal, Interpersonal, Naturalistic and Existential intelligences.

3.4.7. Investors' Personality

The Personality is defined by Allport G. (1961) as the dynamic organisation within the individual of those psychophysical systems that determine his characteristics, behaviour and thought. There are different personality theories like type theory and trait theory. The Big Five Personality Traits are to be taken for the present study. The five-factor theory of McCrae and Costa (1987). Goldberg (1992) named the five-factor theory as the Big Five Personality. The Big Five Personality Traits are Openness, Conscientiousness, Agreeableness, Extroversion, and Neuroticism.

The results of the review of research show the path towards the influence of investors' intelligence and personality on their investment behaviour. In this research study, the investment behaviour of Government employees in relation to their intelligence and personality is studied.

3.4.8. Kerala Government Employees

The Kerala Government employees who receive salary by using SPARK (Service and Payroll Administrative Repository for Kerala) who are appointed as public servant or appointed as teachers and employees at aided educational institutions. SPARK is an employee management information system which started to enhance the efficiency and effectiveness and transparency of human resources management in government and it is a project proposed by the National Informatic Centre. Now its service is used by more than five lakh employees from one hundred and twenty departments under government of Kerala. In this study the samples are taken from grade II government employees.

3.5 RESEARCH INSTRUMENT

There are three parts for the Questionnaire to study Investment behaviour, Investor's intelligence and investors' personality along with the demographic data.

3.5.1. Construction of Research Instrument

Research instrument has three parts. They are:

3.5.1.1. Part I - Investment Behaviour Questionnaire

There are 3 Dimensions in this part; they are investment pattern, investment preferences and investment decision making.

1. **Investment Pattern**

The investment pattern has four subdimensions like like investment objectives, factors perceived, actual investment made and risk level perception.

Objectives of investment is studied with the subdimensions like:

1. Good returns (Bishnoi, 2014).
2. Capital Appreciation (Bishnoi, 2014).
3. Liquidity (Bishnoi, 2014).
4. Tax saving (Bishnoi, 2014).
5. Children's education and career (Jothilingam, and Kannan, 2013).
6. Future security (Sood, and Kaur, 2015).
7. Pension (Das, and Jain, 2014).

Factors perceived are studied with the subdimensions like:

1. Return (Bishnoi, 2014).
2. Safety (Sood, and Kaur, 2015).
3. Liquidity (Bishnoi, 2014).
4. Tax saving (Bishnoi, 2014).
5. Diversification (Dhar, et al., 2017).
6. Simplicity (Chandra, and Kumar, 2012).
7. Affordability (Joshi, et al., 2011).
8. Marketability (Sultana, and Pardhasaradhi, 2012).

The actual investment made and risk level perception are studied towards 14 investment avenues like Bank deposits, Post office deposits, Treasury savings, Chit Funds, Non-Banking Financial Companies (NBFCs), Cooperative sector, Financial institutions, Insurance, Real

estate, Tax saving scheme, Commodity, Precious metals, Stock Market, Mutual fund and Debt Market

2. **Investment Preferences**

The investment preferences included the preferences towards 14 investment avenues like Bank deposits, Post office deposits, Treasury savings, Chit Funds, Non-Banking Financial Companies (NBFCs), Cooperative sector Financial institutions, Insurance, Real estate, Tax saving scheme, Commodity, precious metals, Stock Market, Mutual fund and Debt Market

3. **Investment Decision Making Including Rational and Irrational Behaviour**

The investment decision making has two subdimensions like rational behaviour and irrational behaviour which included eight dimensions in each.

The rational behaviour tested on the factors like:

1. Return (Hunjra, et al.,2012, Bishnoi, 2014)
2. Economic Consideration (Dhochak, and Sharma, 2012)
3. Influencing Persons (Divanoğlu, & BAĞCI, 2018)
4. Information Dependence (Alkaraan, and Northcott, 2013)
5. Social Consideration (Berry, and Junkus, 2013)
6. Risk (Dash,2010)
7. Evaluation (Dhochak, and Sharma, 2016)
8. Sustainability (Tran, et al.,2020)

The irrational behaviour is tested on different biases like:

1. Anchoring bias (Ishfaq, and Anjum, 2015)
2. Gambler's fallacy (Kartašova, 2013)
3. Herd effect (Bikhchandani and Sharma, 2001)
4. Mental accounting bias (Thaler, 1999)
5. Overconfidence bias (Qasim, et al., 2019)
6. Regret aversion (Benartzi and Thaler, 1995).
7. Representativeness (Koti, 2019)
8. Availability bias (Kahneman and Tversky, 1972)

3.5.1.2.Part II – Multiple Intelligence Inventory

There are nine dimensions in this part;

1. Verbal Intelligence (Gardner,1983)
2. Logical intelligence (Gardner,1983)
3. Spatial Intelligence (Gardner,1983)
4. Kinesthetic Intelligence (Gardner,1983)
5. Musical Intelligence (Gardner,1983)
6. Interpersonal Intelligence (Gardner,1993)
7. Intra-Personal Intelligence (Gardner,1993)
8. Naturalistic Intelligence (Gardner,1993)
9. Existential Intelligence (Gardner,2000)

This part is helpful to categorize the respondents in different Intelligent groups and helpful in comparing with investment behaviour, which contains twenty seven statements given after validity and reliability tests.

3.5.1.3. Part III – Big Five Personality Traits Inventory

There are five dimensions in this part; they are:

1. Openness (McAdams, 1992).
2. Conscientiousness (Costa, and McCrae, 1999).
3. Extroversion (McCrae, and Costa, 1987)
4. Agreeableness (McCrae, and Costa, 1997)
5. Neuroticism (McCrae, and John, 1992).

This part is helpful to categorize the respondents in different personality traits and helpful in comparing with investment behaviour and it contains twenty statements after validity and reliability test.

3.5.1.4. Scoring

All the dimensions are included statements with five-point rating scale. The BFPI only included negative statements and all other dimensions have only positive statements. The negative statements are scored in reverse order.

3.5.1.4.1. Scoring Details of Investment Behaviour Questionnaire

Scoring of investment pattern related statements are depicted in Table no. 3.5.

Table 3.5.

Part I – 1. Scoring of Investment Pattern Related Statements

Investment Pattern			Risk Level Perception		
Sl. No.	**Response**	**Score**	**Sl. No.**	**Response**	**Score**
1	Very Highly Influenced	5	1	Very High	5
2	Highly Influenced	4	2	Highly In	4
3	Moderately Influenced	3	3	Moderate	3
4	Less Influenced	2	4	Low	2
5	Not Influenced	1	5	Very Low	1

Scoring of investment preferences related statements are depicted in Table no. 3.6.

Table 3.6

Part I – 2. Scoring of Investment Preferences Related Statements

Investment Preferences		
Sl. No.	**Response**	**Score**
1	Highly Preferred	5
2	Preferred	4
3	Neutral	3
4	Less Preferred	2
5	Not Preferred	1

Scoring of investment decision making related statements are depicted in Table no. 3.7.

Table 3.7

Part I – 3. Scoring of Investment Decision Making Related Statements

Investment Decision Making		
Sl. No.	**Response**	**Score**
1	Strongly Agree	5
2	Agree	4
3	Neutral	3
4	Disagree	2
5	Strongly Disagree	1

3.5.1.4.2. Scoring Details of Multiple Intelligence Inventory

Scoring of Multiple Intelligence related statements are depicted in Table no. 3.8.

Table 3.8

Part II – Scoring of Multiple Intelligences Related Statements

Multiple intelligence		
Sl. No.	**Response**	**Score**
1	Strongly Agree	5
2	Agree	4
3	Neutral	3
4	Disagree	2
5	Strongly Disagree	1

3.5.1.4.3. Scoring Details of Big Five Personality Inventory

Scoring of Investors' personality related statements are depicted in Table no. 3.9.

Table 3.9

Part III – Scoring of Big Five Personality Trait Related Statements

Positive statements			Negative statements		
Sl. No.	**Response**	**Score**	**Sl. No.**	**Response**	**Score**
1	Strongly Agree	5	1	Strongly Agree	1
2	Agree	4	2	Agree	2
3	Neutral	3	3	Neutral	3
4	Disagree	2	4	Disagree	4
5	Strongly Disagree	1	5	Strongly Disagree	5

3.5.2. Pilot Study and Validity and Reliability Tests

In order to check the clarity, accuracy and validity of the questionnaire, a pilot study was conducted among hundred respondents. Based on the validity and reliability test on the responses, some alterations were made in the final research instrument.

3.5.2.1. Content Validity

Content validity (Rossiter, 2008) is defined as "the degree to which elements of an assessment instrument are relevant to a representative of the targeted construct for a particular assessment purpose"

Content validation is a mixed method, both quantitative and qualitative process that is applicable to all elements of the research instrument. Lawshe (1975) content validity technique was used for analysis. Here the investment decision making scale, the personality traits scale and Multiple Intelligence Inventory are truly using the psychological analysis and thus content validity test was used for validation.

The importance of content validity for the validation of the target concept varies depending on how accurately the concept is defined and the degree to which "experts" approve the construct.

The experts' inputs were then used to compute the Content Validity Ratio (CVR) for each ith item in the questionnaire (CVR_i) as follows:

$$CVR = \frac{ne - N/2}{N/2}$$

Where

N = The total number of panellists

ne = The number of panellists indicating "essential"

Lawshe (1975) has established minimum CVRs for different panel sizes based on a one-tailed test at the 0.05 significance level as 0.5, means that 50% of the panellists of size N believe that a measurement item is "essential" and thereby valid. This technique was used for validation of the investment decision making scale, personality trait scale and Multiple Intelligence Inventory after collecting opinion from 6 experts in the field. Only statements which have a score of 0.50 or above have been included in the final research instrument. From the investment decision making scale, 1 statement was deleted after validation and 4 statements from investment pattern and 1 from investment preferences are also deleted because the CVR is below 0.5. All the statements in the Big Five Personality Inventory are found essential whereas 9 statements found non-essential in the Multiple Intelligence Inventory.

3.5.2.2.Construct Validity

Construct validity is the range to which the measure 'behaves' in a way dependable with theoretical premises and denotes how well scores on the instrument are indicative of the theoretical construct (International Encyclopedia of Public Health, 2008). Construct validity is very important in psychological based tests and here two psychological tests are to be conducted based on theories like Multiple Intelligence and Big Five Personality Traits. The research study used correlation coefficient for testing construct validity.

There are nine types of intelligence and each have three statements. An intercorrelation between the three was calculated and non-significant statements were removed. Table no. 3.10 depicts the inter statement correlation.

Table 3.10.

Interrelation Between Different Statements in Multiple Intelligence Inventory

1. Verbal Intelligence				**6. Interpersonal Intelligence**			
	VI1	VI2	VI3		IPI1	IPI2	IPI3
VI1	-			IPI1	-		
VI2	.791**			IPI2	.718**		
VI3	.653**	.668**	-	IPI3	.646**	.759**	-
2. Logical Intelligence				**7. Intra personal Intelligence**			
	LI1	LI2	LI3		II1	II2	II3
LI1	-			II1	-		
LI2	.746**			II2	.775**		
LI3	.676**	.780**	-	II3	.572**	.607**	-
3. Spatial Intelligence				**8. Naturalistic Intelligence**			
	SI1	SI2	SI3		NI1	NI2	NI3
SI1	-			NI1	-		
SI2	.651**			NI2	.718**		
SI3	.631**	.746**	-	NI3	.529**	.645**	-
4. Kinesthetic Intelligence				**9. Existential Intelligence**			
	KI1	KI2	KI3		EI1	EI2	EI3
KI1	-			EI1	-		
KI2	.668**			EI2	.711**		
KI3	.548**	.677**	-	EI3	.626**	.720**	-

5. Musical Intelligence			
	MI1	MI2	MI3
MI1	-		
MI2	.766**		
MI3	.712**	.767**	-

**. Correlation is significant at the 0.01 level (2-tailed).

From the Table 3.10 it is evidenced that all the statements are significant and thus all are selected for final research instrument.

There are five personality traits, each with four statements, and the relationship between these four statements is calculated and irrelevant statements are removed.

Table no. 3.11 depicts the inter statement correlation.

Table 3.11.

Interrelation Between Different Statements in Big Five Personality Inventory

1. Openness					4. Agreeableness				
	O1	O2	O3	O4		A1	A2	A3	A4
O1	-				A1	-			
O2	.816**				A2	.672**			
O3	.144**	0.109*			A3	.217**	.146**		
O4	.198**	.177**	.543**	-	A4	.247**	.239**	.561**	-

2. Conscientiousness					5. Neuroticism				
	C1	C2	C3	C4		N1	N2	N3	N4
C1	-				N1	-			
C2	.682**				N2	.477**			
C3	.287**	.273**			N3	.262**	.123*		
C4	.327**	.287**	.641**	-	N4	.233**	.200**	.566**	-

3. Extroversion				
	E1	E2	E3	E4
E1	-			
E2	.682**			
E3	.140**	.105*		
E4	.214**	.200**	.657**	-

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

From the Table 3.11 it is evidenced that all the statements are significant and thus all are selected for final research instrument.

3.5.2.1. Reliability

Reliability refers to the consistency of a measure. The data collected from the pilot study is subjected to reliability test using Cronbach Alpha. "Cronbach's alpha is a model of internal consistency reliability based on the average inter-item correlation of an instrument" (Rovai, et al., 2014). Table no. 3.12 depicts the result of reliability test of the instrument.

Table 3.12.

Reliability of Different Dimensions of Questionnaire

Dimensions	Cronbach's Alpha	No. of Items
Investment Decision making	.794	47
Investment preferences	.868	14
Investment Pattern (Risk perception excluded)	.764	29
Risk level perception	.810	14
Investors' intelligence	.895	27
Investors' personality	.794	20

According to Malhotra (2005) the variables which have reliability alpha more than 0.60 is acceptable. From the Table 3.12 it is found that the reliability coefficients for the variables chosen for this study are more than acceptable value. So, the items constituting each variable under study have reasonable internal consistency. A deletion of any item doesn't reflect much on the Cronbach's alpha value (reliability). So, all the items taken for scale construction qualify to develop the scale.

3.5.3. Details of Final Research Instrument

There are three parts for the Questionnaire along with the demographic data.

3.5.3.1. Part I – Investment Behaviour Questionnaire

Investment pattern contained forty three and Investment preferences contained 14 statements while Investment decision making scale contains forty seven statements after validity and reliability test twenty three from rational and twenty four from irrational. Table 3.13 shows the details of questionnaire.

Table 3.13

Components of Investment Behaviour Questionnaire

Dimensions	Item No.	Total no.	Percentage
Investment pattern including Risk level perception	2.1 to 2.7, 3.1 to 3.8, 5.1 to 5.14, 6.1 to 6.14	43	41
Investment Preferences	4.1 to 4.14	14	13
Investment decision making –			
- Rational behaviour	7.1 to 7.23	23	22
- Irrational behaviour	8.1 to 8.24	24	23

3.5.3.2. Part II – Multiple Intelligence Inventory (MII)

There are nine Dimensions in this part and it is helpful to categorize the respondents in different Intelligent group and helpful in comparing with investment behaviour which contains twenty seven statements after validity and reliability test. Table 3.14 shows the details of inventory.

Table 3.14

Components of Multiple Intelligence Inventory

Dimensions	Item No.	Total no.	Percentage
Linguistic/Verbal Intelligence	1,2,3	3	11.11
Logical/Mathematical intelligence	4,5,6	3	11.11
Spatial Intelligence	7,8,9	3	11.11
Bodily/Kinesthetic Intelligence	10,11,12	3	11.11
Musical/Rhythmic Intelligence	13,14,15	3	11.11
Interpersonal Intelligence	16,17,18	3	11.11
Intra-Personal Intelligence	19,20,21	3	11.11
Naturalistic Intelligence	22,23,24	3	11.11
Existential Intelligence	25,26,27	3	11.11

3.5.3.3. Part III – Big Five Personality Inventory (BFPI)

There are 5 Dimensions in this part and it is helpful to categorize the respondents in different personality traits and helpful in comparing with investment behaviour and it contains 20 statements after validity and reliability test. Table 3.15 shows the details of inventory.

Table 3.15

Components of Big Five Personality Inventory

Dimensions	Item No.	Total no.	Percentage
Openness	1,2,3,4	4	20
Conscientiousness	5,6,7,8	4	20
Extroversion	9,10,11,12	4	20
Agreeableness	13,14,15,16	4	20
Neuroticism	17,18,19,20	4	20

3.6. PERIOD OF STUDY

The total period of the research is 2018 July to 2023 July. The pilot study and validation of questionnaire have completed in May 2021. The final data collection was taken seven months from July 2021 to April 2022. The data collected are on the investment made by the Government officers till date of their response. Their preferences, cognitive and behavioural aspects related to investment decision making are studied.

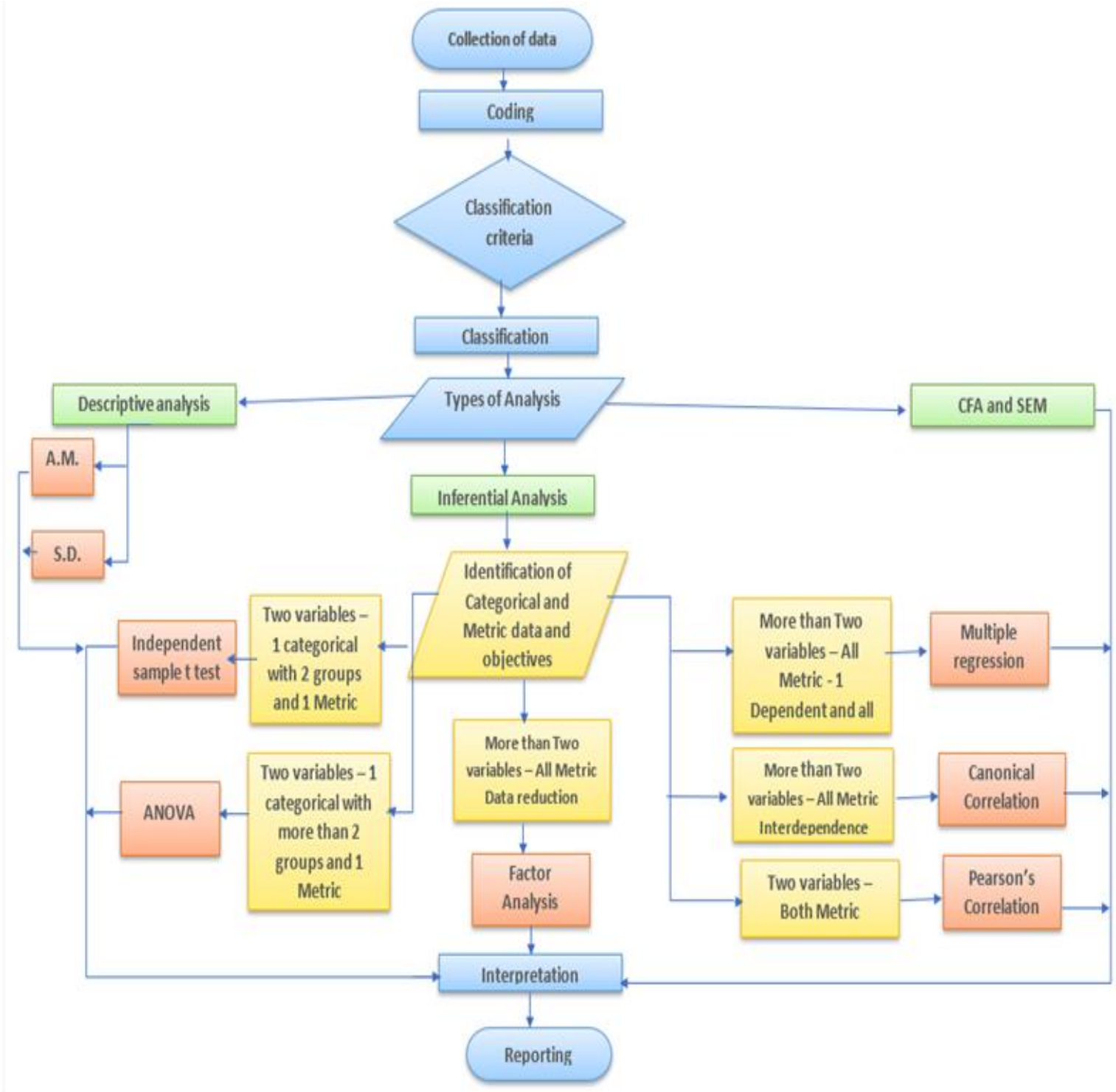
3.7. DATA ANALYSIS

3.7.1. Process of Data Analysis

After data collection, coding the data, and classification of data, the analysis process started. The tools used are based on the variables, types of data. The process is depicted in figure 3.11.

Figure 3.11

Process of Data Analysis



3.7.2. Data Analysis Tools

For analysing the collected data, Tools from descriptive statistics and inferential statistics are used. The plan is placed in Table 3.16.

Table 3.16

Data Analysis Framework

Sl. No.	Objectives	Tools Applied
1.	Data validity and reliability	Content validity, Construct validity Cronbach's Alpha
2.	Demographic profile	Descriptive statistics Percentage analysis
3.	Demographic difference analysis for each dependent variable like Investment Pattern, Investment Decision making, Investors' personality, Investors' intelligence	Mean, Standard deviation ANOVA, independent sample t test
4.	Factors in investment and objectives	Factor analysis
5.	Relationship between Risk Perception and Investment Preferences	Pearson's Correlation coefficient
6.	Relationship between Investors' intelligence, Investors' personality on Investment Pattern	Pearson's Correlation coefficient
7.	Impact of Investors' intelligence, Investors' personality and Investment pattern on Rational Investment Decision making	Multiple Regression
8.	Impact of Investors' intelligence, Investors' personality and Investment pattern on Irrational Investment Decision making	Multiple Regression
9.	Relationship between Investors' intelligence, Investors' personality, Investment Decision making, Objectives and factors perceived on Investment on Investment Preferences	Canonical Correlation
10.	Inter effect of Investors' intelligence, Investors' personality, on investment behaviour including Investment Pattern, Investment Decision making and Investment Preferences	Structural Equation Model

Data analysis was conducted using SPSS 25.0 and AMOS 23.0

3.7.2. Independent Sample t Test

Independent sample t-test is the most preferred inferential statistic to test the difference between two social and demographic groups on a phenomenon. The difference between the two independent groups is to be found by using a t-test. Here the differences between two gender groups and categories of employees on investment pattern, preferences and decision making are to be found by independent sample t-test.

3.7.3. ANOVA

ANOVA is the most preferred inferential statistics to test the difference between different social and demographic groups on a phenomenon. The difference between two or more groups are to be found out for the purpose ANOVA is used. Here the differences between different age groups, income levels, marital status and volume of savings on investment pattern, preferences and decision making are to be found by ANOVA.

3.7.4. Factor Analysis

Exploratory factor analysis or principal component analysis is used for reducing variables in multivariate analysis. Here factor analysis is to be used to reduce the factors affecting investment decision making and objectives of investment

3.7.5. Multiple Regression Analysis

Regression Analysis is a scientific measure of the normal relationship between two or more variables in terms of the original units of the data. In regression analysis there are two types of variables. The variable whose value is influenced or is to be predicted is called dependent variable and the variable which influences the values or is used for prediction is called independent variable. In this study, effect of relationship of rational and irrational behaviour in decision making and their corresponding independent variables are calculated using multiple regression analysis.

Table 3.17

Data analysis Framework for Multiple Regression

Independent Variables	Dependent Variable
Multiple Intelligence	Rational investment decision making
Multiple Intelligence	Irrational investment decision making
Big five personality traits	Rational investment decision making
Big five personality traits	Irrational investment decision making

Factors and objectives in investment	Rational investment decision making
Factors and objectives in investment	Irrational investment decision making
Behavioural biases	Rational investment decision making
Prudence	Irrational investment decision making

3.7.6. Canonical Correlation

Canonical correlation analysis explores the relationships between two multivariate sets of variables, all measured on the same individual. One approach to studying relationships between the two sets of variables is to use canonical correlation analysis which describes the relationship between the first set of variables and the second set of variables. It is not necessarily thought of one set of variables as independent and the other as dependent, though that may potentially be another approach.

Table 3.18

Data Analysis Framework for Canonical Correlation

Variables set 1	**Variable set 2**
Investors' intelligence and Personality	Investment Preferences
Factors perceived on investment	Investment Preferences
Objectives of investment	Investment Preferences
Rational and Irrational Decision making	Investment Preferences

3.7.7. Structural Equation Modelling (SEM)

Structural Equation Modelling is the multivariate analysis which helps to analyse relationship model. Structural Equation Models are models that explain relationships between measured variables and latent variables, and relationships between latent variables. This is the combination of Path analysis and factor analysis. Path analysis is a graphical representation of multiple regression models. In this analysis, the graphs represent the relationship between the dependent and independent variables with the help of squares and arrows. Path analysis contain only observed variables and it assumes that all the variables are measured without error and in SEM latent variables are also included in analysis.

A SEM is composed of two parts: a structural part, linking the constructs to each, and a measurement part, linking the constructs to observed measurements. The first part expresses the linear relationship between endogenous (dependent) variable and exogeneous

(independent) variable. To study the indirect effect of the exogeneous or independent variables like Multiple Intelligence and personality traits on the endogenous or dependent variables like investment preference and investment decision making, Structural Equation Model is to be performed. The second part resembles a confirmatory factor analysis model.

Table 3.19

Data analysis Framework for Structural Equation Model

Independent Variables	Dependent Variable
Investors' intelligence and Personality	Investment Pattern
Investors' intelligence and Personality	Investment Preferences
Investors' intelligence and Personality	investment Decision Making

3.8. Ethical Consideration

The study was conducted with clearance from the Institutional Human Ethical Committee. As the respondents are Kerala Government employees, the study was submitted for permission from higher officials and got a permission letter. The research study is based on the psychological aspects of Government employees with their investment behaviour. The selection of samples and collection of data was done with due care. The research instrument is developed and standardised using respectful language and ends with gratefulness. The confidentiality statement was included in the preliminary part of the research instrument. The respondents have signed in the informed consent before responding to the instrument. After preparing questionnaire, the study was submitted to the approval of Institutional Human ethical Committee and got approval; No. AUW/IHEC/COM21-22/XPD-12. During data collection, the researcher promised the respondent that the data were used only for research purposes and that the personal data were not disclosed anywhere. The study collected data without inhibiting the employees' official duties, and they can discontinue participation at any moment.

The data analysis and results are included in Chapter 4.