Methodology is the key aspect which governs the outcome of the research. It is the general research strategy that outlines the way in which research is to be undertaken and among other things, identifies the methods to be used. The methodology of the research study has been explained in following heads:

3.1 Nature of Research
3.2 Selection of the Study Area
3.3 Selection of the Sample Units
3.4 Tools for Collection of Data
3.5 Tools for Analysis of Data

3.1 Nature of Research

Descriptive research is chosen to attain the research objectives as descriptive research studies, which are concerned with describing the characteristics of a particular individual or group. Descriptive research also concerned with specific predictions, with narration of facts and characteristics concerning individual, group or situation (Kothari 2008). Most of the social research comes under this category.

3.2 Selection of the Study Area

Coimbatore District has been selected as study area. Coimbatore is a city in southern India, a major commercial and business hub in the state of Tamil Nadu. It is the highest revenue yielding district in the state even ahead of Chennai, thus making it one of the fastest-growing second-tier metro cities in India. Economy of Coimbatore is heavily influenced by Information Technology, Engineering and Textiles Industries. Coimbatore is called the Manchester of South India. Coimbatore city has two Special Economic Zones (SEZ), the Coimbatore Hi-Tech Infrastructure (CHIL) SEZ and the TIDEL Park and five more SEZs are in the pipeline.
Methodology

Determinants of Investment Behaviour of Individual Investors

**Research Design**

**Nature of Research- Descriptive**

**Selection of Sample Unit (Multistage Sampling)**

**Selection of Study Area**

Coimbatore District

**Selection of Companies**

52 Companies out of 85 Companies in Information Service Sector (Purpose Sampling)

**Selection of Individuals**

482 Information Technology Professional (Information Referral Sampling Method)

**Data Collection- Interview Schedule**

**Tools for Analysis**

- **Descriptive Statistics**
  - Distribution of Responses

- **Analysis of Variance**
  - Significant mean difference on Socio economic factors on the preference of portfolio and attitude towards investment and risk

- **Chi-Square Test**
  - Association between socio economic factors and level of awareness

- **Tukey HSD Post Hoc Test**
  - Socio economic factors with the attitude towards investment and risk

- **Garret Ranking Technique**
  - Factors influencing investment decision

- **Factor analysis**
  - Determinants of investment behaviour

- **Correlation Analysis**
  - Intention to invest and actual investment with rational and irrational behaviour

- **Regression analysis and Structural Equation Modeling (SEM)**
  - Rational model
  - Irrational Model
  - Composite Model

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**Figure 1: Schematic Representation of Methodology**
In 2013, Coimbatore ranked 15\textsuperscript{th} in the list of most competitive (by business environment) Indian cities. The city is the second largest software producer in Tamil Nadu, next to Chennai. IT and BPO industry in the city has grown greatly with the launch of TIDEL park and other planned IT parks in and around the city. It is ranked at 17\textsuperscript{th} among the global outsourcing cities. Companies like Cognizant Technology Solutions, Wipro, Infosys, Robert Bosch GmbH, IBM, Tata Consultancy Services, Tata Elxsi, Dell, Cameron International, CSS Corp and KGISL having a presence in the city. Software exports stood at ₹1710.66 Crores (77.1 billion) for the financial year 2013-14 upto 90 per cent from the previous year.

3.3. Selection of the Sample Units

The selection of sampling unit is also another important aspect before selecting the sample. Sampling unit may be a geographical one such as state, district, village, etc., or it may be a social unit such as family, club, school, etc., or it may be an individual. Hence, in the research study, professionals of information technology sector who are under Business Process Outsourcing (BPO), Knowledge Process Outsourcing (KPO), Information Technology Enabled Services (ITES) and Software Development are selected as sampling unit, because Indian’s IT industry provided skilled employment both in India and abroad, generating direct employment for nearly 2.8 million persons and indirect employment of around 8.9 million in 2013-14. When the nation was in the midst of an IT revolution a decade back, Industrial scenario at Coimbatore was readying itself for a major change. It was just a matter of time before the textile city became a centre for software majors. IT companies that placed their faith in Coimbatore’s potential have grown at a rapid pace and created huge number of employments opportunity next to textile (Times of India Tech, 2013). As per the NASSCOM’s report, the remuneration practices in Indian companies with median salaries of fresh graduates in the range of Rs 18,500 to Rs 25,000 with effective from 2014. Information Technology employees are at the top of the pay scale for fresh hires in India, and saw the highest salary increase, outperforming other jobs like sales, human resource management, administration and support
Methodology

services. This motivated the researcher to select the professionals of Information Technology sector as sampling unit. As the sampling is carried out in different stages, the sampling considered for the study is multi stage sampling technique.

- In the first stage, Coimbatore District was selected because it is the second IT Hub of Tamil Nadu.
- In the second stage, eighty five companies from information technology sector were identified in the Coimbatore District from registrar of companies and all the eighty five companies were approached for the data collection and out of eighty five companies, fifty two companies gave permission to collect data from their employees.
- In the third stage, it is the selection of individuals. Individuals, who are in direct production, are considered for the study, a total of 1123 were resulted. The population selected for the research is large and all the respondents could not be interviewed due to practical difficulties, only selected samples were taken for the study because many respondents were reluctant to disclose their financial information. Hence the data are collected from the individuals who are willing to reveal the information on their financial behaviour by adopting informational referral sampling technique. When the target population is thinly distributed across a vast area, the informational referral sampling technique is suitable for data collection.

The sample respondents of 525 were resulted, 482 were validated and the remaining was rejected due to incomplete information. The final samples of 482 were processed with the response rate of 91.85 per cent.

3.4 Tools for Collection of Data

The task of data collection begins after the research problem has been defined and research design chalked out. While deciding the method of data collection both primary and secondary sources are used.
3.4.1 Pilot Study

A preliminary investigation is undertaken by contacting 75 respondents to identify the important variables regarding characteristic features of instrument and the changes, preference of investments, investment decisions, awareness and determinants of investment. The purpose of the pilot study is to test the quality of the items in the interview schedule and to confirm the feasibility of the study. This preliminary investigation is conducted in 15 IT companies in Coimbatore. It is ascertained that the items in Likert’s five point scale of the interview schedule are highly reliable and the samples satisfy the normal distribution rationally. So, the items in the interview schedule can be used further in the study.

3.4.2 Primary Data

The research focuses on individual investment behaviour. Hence the first hand information is important from the target group. The primary data was collected from 525 respondents through well structured interview schedule, personally administered and observed from surveying the locality and from personal interviews. A well structured interview schedule was prepared covering the socio-economic profile of the respondents, level of awareness of the respondents, objectives of investment and attitude towards investment and risk of the respondents and determinants under rational and irrational behaviour and 482 were validated.

3.4.3 Measurement of Variables

Likert scaling technique was adopted to measure the variables under awareness, attitude towards investment and risk, motivational factors for investment and the rational and irrational behaviour.

3.4.4 Reliability and Validity Test

A pre-test of the research instruments to establish the validity was done. To determine the internal consistency or reliability of scaled item the reliability and validity test was conducted and the result has been presented in the Table 3.
### Table 3
Reliability and Validity Index

<table>
<thead>
<tr>
<th>Scaled Items</th>
<th>Cronbach’s Alpha</th>
<th>Number of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of Awareness</td>
<td>0.806</td>
<td>12</td>
</tr>
<tr>
<td>Attitude towards Investment</td>
<td>0.761</td>
<td>08</td>
</tr>
<tr>
<td>Attitude towards Risk</td>
<td>0.845</td>
<td>09</td>
</tr>
<tr>
<td>Intention to Invest</td>
<td>0.807</td>
<td>04</td>
</tr>
<tr>
<td>Rational Behaviour</td>
<td>0.921</td>
<td>18</td>
</tr>
<tr>
<td>Irrational Behaviour</td>
<td>0.893</td>
<td>23</td>
</tr>
</tbody>
</table>

Source: Computed Data

#### 3.4.5 Secondary Data

The secondary data has been collected from different sources like journals, RBI bulletins, magazines and newspaper; various reports of professional bodies etc., the data pertaining to the savings behaviour in India are collected from the annual reports of SEBI, reports from Ministry Finance and India Economic Survey.

#### 3.4.6 Period of the Study

- The study was conducted from September 2011 to March 2015
- The data collection was done for a period of six months from January 2013 to June 2013.

#### 3.5 Tools for Analysis of Data

The sources of data are primary as well as secondary. The data collected from the individuals’ survey constitutes primary and information gathered through books, journals, magazines, reports, dairies are considered as the secondary source. The data collected from both the sources is scrutinized, edited and tabulated. The data is analyzed using Statistical Package for Social Sciences (SPSS) and AMOS 23. The following statistical tools are used in the study.

#### 3.5.1 Percentage Analysis

Percentage analysis is one of the basic statistical tools which is widely used in analysis and interpretation of primary data. It deals with the number of
respondents’ response to a particular question in percentage arrived from the total. Simple percentages are used in the study to analyse the variables in the study like socio-economic factors, investment behaviour, level of awareness, attitude towards risk and investment.

3.5.2 Cross Tabulation

Cross tabulation is used to identify the inter relationship between variables in the research study. In the present research study cross tabulation is done for socio-economic factors with preference of portfolio, socio economic factors with level of awareness and attitude towards investment and risk with socio-economic factors.

3.5.3 F Test – ANOVA

Analysis of Variance is a way to test the equality of three or more means at one time by using variances. This is used to analyse the variables in the study for analysing the influence of various socio-economic factors on the preference of portfolio and on the attitude of respondents towards investment and risk.

3.5.4 Chi-square Analysis

Chi-square analysis is used in the study extensively to evaluate the association between two variables. To find the association between variables under socio-economic factors and level of awareness, the Chi-square test is applied.

3.5.5 Tukey HSD Post Hoc Test

Post-hoc analysis is done with the aim of finding out the patterns in the sub- groups of the sample. Post Hoc Test was done whenever there is significant relationship within the group in the analysis of variance. Tukey's multiple comparison test is one of several tests that can be used to determine which means amongst a set of means differ from the rest. Tukey HSD (Honestly Significant Difference) test can be applied only for the variable which has more than two categories. The test is applied to identify the mean difference between the socio-economic factors with the attitude towards investment and risk.
3.5.6 Garrett Ranking Techniques

To find out the most significant factors which motivate and influence the respondents while making investment decisions, Garrett’s ranking technique was used. As per this method, respondents have been asked to assign the rank for all the factors and outcome of such ranking have been converted into score value with the help of the following formula:

\[
\text{Percent Position} = 100\left(\frac{R_{ij} - 0.5}{N_j}\right)
\]

Where,

- \(R_{ij}\) = Rank given for the \(i^{th}\) factor by the \(j^{th}\) respondents
- \(N_j\) = Number of factors ranked by the \(j^{th}\) respondents.

By referring the Garrett’s table, the percent position estimated is converted into scores. Then for each factor the scores of each individual are added and then mean values is considered to be the most important.

3.5.7 Factor Analysis

Factor analysis is an interdependence technique, whose primary purpose is to define the understanding structure among the variables in the analysis. Factor analysis provides the tools for analyzing the structure of the interrelationships (correlations) among a large number of variables by defining sets of variables that are highly interrelated, known as factors. These groups of variables (factors), by definition highly inter-correlated are assumed to represent dimensions within the data. If the researcher is only concerned with reducing the number of variables, then the dimensions can guide in creating new composite measures. On the other hand, if he has a conceptual basis for understanding the relationships between variables, then the dimensions may actually have meaning for what they collectively represent. In the latter case, these dimensions may correspond to concepts that cannot be adequately described by a single measure.

In this study exploratory factor analysis is used to extract determinants of rational behaviour and irrational behaviour of individual investors. To test the
sample adequacy the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy test is applied, it is used to quantify the degree of inter correlations among the variables and the appropriateness of Factor analysis. Bartlett test of Sphericity was also applied to test the correlation among the variables. “Principle component analysis” method of factor extraction is used in this research as it considers the total variance and derives factors that contain small proportion of unique variance and, in some instances, error variance.

In order to achieve the research objective of identifying a structure with the help of underlying dimensions of all variables, “Varimax” factor rotation method is used. This criterion centers on simplifying the columns of the factor matrix. With the “Varimax” rotational approach, the maximum possible simplification is reached if there are 1s and 0s in the column. That is, the “Varimax” method maximizes the sum of variance of the required loadings of factor matrix.

3.5.8 Proposed Model on Rational Behaviour

Behavioural Finance attempts to explain and increase understanding of the reasoning patterns of investors, including the emotional processes involved and the degree to which they influence the decision making process. Among all the theoretical frameworks that have been adopted to examine the decision making processes of investors, the Theory of Planned Behaviour (TPB) (Ajzen, 1991) have been found to be the popular behavioural model and the basic assumption of TPB is people are rational being. Hence, an attempt is made in the research study to explain the behaviour of individual investors by using the TPB and the proposed model is coined as model on rational behaviour. Based on the concept of Theory of Planned Behaviour, the following model was designed to identify a relationship between intention to invest and actual investment with the determinants of rational behaviour.

3.5.8.1 Concepts of key variables under Rational Behaviour

By performing exploratory factor analysis, the set of five independent variables have been attained and named as self efficacy, perceived return, perceived risk, peer influence and advisor influence.
Methodology

- **Actual Behaviour**: In the study the actual behaviour is the actual investment made by the individual investors.

- **Intention to Invest**: Intention to invest is an indicator of the individual's to perform a given behaviour. It is based on attitude toward the behaviour, subjective norm, a perceived and behavioural control. The dependent variable “intention to invest” is identified through factor analysis and named after careful study of earlier research in the area of investment behaviour (Philmore Alleyne & Tracey Broome 2010) and Theory of Planned Behaviour (Icek Ajzen 1991).

- **Subjective Norm**: The ability of investment decision speaks about the subjective norm behaviour of individual, how the belief on them and in the study it is named as self efficacy.

- **Attitude towards Behaviour**: It is the degree to which performance of the behaviour is positively or negatively valued. It is determined by the total set of accessible behavioural beliefs linking the behaviour to various outcomes and other attributes; it is classified in the study as perceived risk and perceived return.

- **Behavioural Control**: A behavioural control is an individual's perception of social normative pressures. It is classified as influence of peer group and the influence of advisors.

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![Figure 2: Proposed Model on Rational Behaviour](image-url)
3.5.9 Proposed Model on Irrational Behaviour

Apart from the factors under theory of planned behaviour the individual investors are also influenced by various behavioural traits, hence a model is proposed to study the impact of behavioural traits on the investment behaviour of individual investors by applying the cognitive and emotional factors and the model is termed as irrational behavioural model.

3.5.9.1 Concepts of key variables under Irrational Behaviour

The behavioural biases expressed by the investors also influence the intention of individuals to make investment (Sherman, S.J et al 1983). Those behavioural biases are identified through exploratory factor analysis and termed as irrational behavioural factors and named on the basis of cognitive and emotional factors of behavioural finance.

- **Representativeness**: The investors’ recent success; tend to continue into the future also. The tendency of investors to make decisions based on past experience.

- **Overconfidence**: The investors overestimate their predictive skills or assuming more knowledge then they have.

- **Anchoring**: Investors act based on the fixed numbers without considering the environmental changes.

- **Availability bias**: The investors place undue weight for making decisions on the most available information.

- **Loss aversion**: Loss aversion is an important psychological concept which receives increasing attention in economic analysis. The investor is a risk-seeker when faced with the prospect of losses, but is risk-averse when faced with the prospects of enjoying gains.

- **Regret aversion**: The aversion is the desire of the people to avoid the feeling of the pain of regret due to their poor investment decisions or for losing a good investment opportunity.
**Mental accounting:** Mental accounting describes people’s tendency to code, categories and evaluate economic outcomes by grouping their assets into number of non-interchangeable mental accounts.

![Diagram](image)

**Figure 3: Proposed Model on Irrational Behaviour**

### 3.5.10 Composite Model on Investment Behaviour

The determinants of rational and irrational behaviours are combined, to study the impact on intention to invest.

![Diagram](image)

**Figure 4: Proposed Composite Model on Investment Behaviour**
3.5.11 Correlation Analysis

Correlation analysis is a measure of the size and direction of the association between variables. It showed the strength of the association between two continuous variables. This test is applied to evaluate the relationship between

I. The determinants of rational behaviour with intention to invest and actual investment and

II. The determinants of irrational behaviour with intention to invest and actual investment.

3.5.12 Multiple Regression Analysis

Multiple Regression analysis is a method for studying the effects and the magnitudes of the effects of more than one independent variable on one dependent variable using principles of Correlation and Regression. Regression analysis helps in determining the potential relationship or shared common variance between the predictor and the criterion variables where dependent variable being the criterion and independent variable the predictor. Multiple regression analysis is one of the most commonly used multivariate statistical technique used for studying the relationship between a single dependent variable and several independent variables, in other words, it is used to study the individual and combined contributions of several independent variables to the variance of a dependent variable.

In the present study Multiple Regression analysis was carried out to identify the influence of rational behaviour on intention to invest and the influence of intention to invest, peer and advisors influence on the actual investment. The step wise multiple regression analysis was carried out to identify the influence of determinants of irrational behaviour on the intention to invest and actual investment.
3.5.13 Structural Equation Modeling

Structural Equation Modeling (SEM) is widely used in behavioural research. It is a data analysis method that seeks to explain the structure of interrelationships between multiple variables. It allows both confirmatory and exploratory modeling; they are suited to both theory testing and theory development. It consists of two parts: the measurement model and the structural model. SEM estimates a series of separate, but interdependent, multiple regression equations simultaneously by specifying the structural model used by the statistical program. Some dependent variables become independent variables in subsequent relationships, giving rise to the interdependent nature of the structural model. The structural model expresses these relationships among independent and dependent variables, even when a dependent variable becomes an independent variable in other relationships. AMOS (Analysis of Moment Structures) is an easy to use SEM program that tests relations among observed and latent variables and then uses models to test hypotheses and confirm relationships.

In the present study SEM is used to test whether the models developed by the researcher are fit or not and also the interrelationships are examined. The conceptual models were developed initially by the researcher for rational, irrational and composite behaviour and have test by using SEM. The assessment of fit is a basic task in SEM (Structural Equation Model) modeling. The Root Mean Square Residual (RMR), Comparative Fit Index (CFI), Goodness-of-Fit Statistic (GFI), Adjusted Goodness-of-Fit Statistic (AGFI), Root Mean Square Error of Approximation (RMSEA) are used to measure the goodness of fit to the data.