CHAPTER 3
RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction
The previous chapter identified and discussed the methods of shareholder value creation and reviewed the literature concerning the bank valuation methods. This chapter outlines and describes research design and methodology used in testing the hypotheses. It also delves into data sources and specific regression models that link performance measures to the dependent variable of MVA.

3.2 Statement of the Research Problem
It is widely accepted that the main goal of the company is to maximize returns for its shareholders. Shareholders’ wealth maximization is the criterion through which the performance of the company or organization can be analyzed optimally. Shareholder value creation became important benchmark for measuring the economic performance of the companies in the late nineties when Alfred Rapport published a book entitled ‘Creating Shareholder Value’. As historical measures like return on capital employed, return on net worth, and profit after tax failed in measuring the economic performance of the companies, value based measures like Market Value Added, Economic Value Added, Shareholder Value Added, and Created Shareholder Value became popular in measuring the economic performance of the companies. These measures became popular because they considered cost of capital which was used as a discount rate in finding the present value of future cash flows that the business is likely to generate.

In this backdrop, it becomes quite essential to analyze the performance of the organizations using value based measures which account for the cost of capital and thus measures the true economic value of the organization. Banks being a highly
levered entity rely heavily on equity capital to support a higher level of financial leverage. As the financial leverage increases financial risk, equity shareholders will require a higher rate of return in order to be compensated for assuming a higher degree of risk. Hence, using value based methods becomes quite useful in valuing banks, which measures the returns earned by banks over and above the returns required by equity shareholders.

This study focuses on measuring shareholder value creation through Market Value Added (MVA) and Created Shareholder Value (CSV) as the measures of shareholder value creation in the context of Indian banks. As discussed in the previous chapter, that majority of the past studies revolved around EVA. This study thus aims at analyzing the performance of Indian banks through the methods of value based measures like MVA and CSV.

3.3 Objectives of the study

The basic objective of the study is revolving around measuring shareholder value creation in Indian banks. Market Value Added and Created Shareholder Value (CSV) have been used as the measures of shareholder value creation. As an MVA directly measures the economic performance of the companies reflected in their market capitalization, it has been used to analyze the shareholders’ wealth of Indian banks. In other words, the change in MVA causes an increase or decrease in the stock market value and stockholders’ wealth. So MVA as a tool for measuring the stock market value or shareholders’ wealth is a criterion for measuring the performance management. Finding out the relationship between Created Shareholders Value and MVA is the second main reason for the selection of this study.

The specific objectives of this study are:
1. To undertake the measurement of shareholder value creation by Indian banks through the methods of Market Value Added and Created shareholder Value during the study period

2. To undertake a comparative study of shareholder value creation by Indian public and private sector banks.

3. To undertake comparative analysis of shareholder value creation amongst the selected Indian banks.

4. To statistically examine the variation in the Market Value Added and Created Shareholder Value figures of public sector banks and private sector banks.

5. To statistically compare MVA and CSV between public and private sector banks.

6. To statistically examine the relationship between MVA of Indian banks and performance measures like ROCE, RONW, PAT, EPS and Interest spread.

3.4 Hypotheses

The null hypothesis method was used to maintain objectivity and avoid ambiguity in the results. This is the hypothesis of no differences. The hypothesis can be accepted or rejected only at certain probability levels. In order to achieve the objectives of the study following hypotheses were framed.

1. Indian banks do not create shareholder value.

2. There is no significant difference between the CSV of Indian public and private sector banks.

3. There is no significant difference between MVA of Indian public and private sector banks.

4. There is no significant positive correlation between MVA and CSV of Indian banks.
5. There is no significant positive relation between MVA and ROCE.
6. There is no significant positive relation between MVA and RONW
7. There is no significant positive relation between MVA and PAT
8. There is no significant positive relation between MVA and EPS
9. There is no significant positive relation between MVA and Interest spread.

3.5 Scope of the study

As the Indian banking sector has been witnessing drastic regulatory changes in the wake of the implementation of the BASEL III accord, it has become quite imperative for them to raise their equity base. Shareholder value creation is the best way to attract equity capital form the capital market at the same time it gives a positive signal to the existing shareholders who are quite keen to earn higher returns on their funds parked with the banks. In this study, an attempt has been made to measure shareholder value creation in Indian banks through the MVA and CSV. Following points highlight the scope of the study.

1. This study is limited to selected public and private sector Indian banks listed with National Stock Exchange. Indian banks considered for this study are listed on NSE (National Stock Exchange) during the entire period of the study. Listing on exchange is a prerequisite since the stock price information is needed for calculating cost of equity.
2. This study is based on secondary data culled from a Prowess database of Centre for Monitoring Indian Economy.
3. The time period of the study is 10 years, ranging from 2000-01 to 2009-10.
4. The study is restricted to 21 Indian banks out of which 11 are private sector banks and 10 are public sector banks, which are selected conveniently considering the availability of the data for the study period.

Following is the list of selected banks in the study.

**Table 3.5:** Name of banks selected for the study

<table>
<thead>
<tr>
<th>Public sector banks</th>
<th>Private sector banks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Bank of Baroda</td>
<td>1. Axis Bank</td>
</tr>
<tr>
<td>2. Bank of India</td>
<td>2. City Union Bank</td>
</tr>
<tr>
<td>4. Dena Bank</td>
<td>4. HDFC Bank</td>
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<tr>
<td>5. IDBI Bank</td>
<td>5. IndusInd Bank</td>
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<tr>
<td>6. Indian Overseas Bank</td>
<td>6. ING Vysya Bank</td>
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<td></td>
<td>11. South Indian Bank</td>
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**3.6 Selection of the Sample**

For the purpose analysis, 21 banks listed with National Stock Exchange are selected conveniently considering the availability of the data for the study period.

**3.7 Sample Size**

For the analysis of the data, 21 Indian banks are selected. 10 public sector and 11 private sector banks are selected for the study. Data of 10 years for the sample banks from the period 2000-01 to 2009-10 are used for the purpose of analysis. The banks selected in samples were listed on National Stock Exchange during the study period 2000 to 2010.
3.8 Data collection

All the financial information required for the study has been sourced from CMIE’s corporate database *Prowess*. The information relating to risk free interest rates has been obtained from the official website of Reserve Bank of India. Weighted average returns on central government dated securities for the latest five years, i.e. a period ranging from 2009-10 to 2014-15 were taken from the Reserve Bank of India website. These rates were 7.23%, 7.92%, 8.52%, 8.36% and 8.45% respectively. For calculating monthly log returns of the sample banks, data regarding the closing prices during the study period were sourced from CMIE Prowess.

Similarly, data regarding closing prices of benchmark index CNX NIFTY 500 were also sourced from CMIE Prowess.

For calculating MVA, market capitalization as of 31st March for each year of the study period was considered which was taken from the CMIE Prowess database. Book values of equity for the same period were also culled from the same software.

For calculating Created Shareholder Value (CSV), following data was collected

1. **Shareholder Value Added (SVA):**

   It has been calculated as follows

   \[
   \text{Shareholder value added} = \text{Increase of Equity Market Value} + \text{Dividends paid during the year} - \text{Outlays for capital increases} + \text{Other payments to shareholders (discounts on par value, share buybacks...) - Conversion of convertible debentures.}
   \]

   To calculate SVA necessary data was culled from the CMIE PROWESS database.

2. **Shareholder Return**

   Shareholder return has been calculated as the ratio of shareholder value added, divided by equity market value at the beginning of the year.
3. **Equity Market Value**

Market capitalization also referred to as equity market value was directly culled from CMIE PROWESS Database.

4. **Cost of Equity**

As the cost of equity is an opportunity cost not a cash cost, it cannot be observed in the market and has to be estimated. The estimation of cost of equity and the usefulness of models such as Capital Asset Pricing Model (CAPM) has been the subject of considerable debate (Goedhart et al. 2002).

In this study CAPM has been used to estimate cost of equity for the sample banks. The CAPM has been used as it is the most widely used theoretical approach in empirical research. (Copeland et al. 2000). There are also advocates of alternative methods such as the estimation of cost of equity through the Arbitrage Pricing Model (APT). We use the CAPM, because of its popularity in the empirical research. The APT or any other more sophisticated method should be used only to the extent that the expected benefits of the new information exceed the cost of providing it. We opt for the CAPM, since the application of the APT is complicated and time consuming. Furthermore, the advantages of the APT relative to the CAPM are low in the case of ex-post analysis of the exchanged traded companies.

“The CAPM postulates that the opportunity cost of equity is equal to the return on risk free securities plus the company’s systematic risk (beta) multiplied by the market price of risk (market risk premium)” (Copeland et al. 2000). The market risk premium equals the difference between the expected return on the market portfolio and the risk free rate of return. Beta is defined
as the covariance between the returns on the individual stock and the returns on the market portfolio (Copeland and Weston, 1992).

Given these assumptions cost of equity can be calculated using the following equation

\[
\text{Cost of Equity} = \text{Risk Free Rate} + \text{Equity Beta} \times (\text{Equity risk premium})
\]

5 Beta

In order to calculate the cost of equity, it is quite necessary to calculate beta of a stock. The beta of a stock measures the sensitivity of the stock return with the return on a market index. It thus highlights the volatility in the movement of stock returns vis-a-vis this movement of the entire market. It implies that higher the beta greater will be the volatility in stock returns and hence greater will be the risk.

Beta can be calculated by regressing the stock returns against the returns on a market index. There is no theoretically determined time period and time intervals for calculating beta. The time period and the time interval may vary. The returns may be measured on a daily, weekly or monthly basis. (Pandey, 2010)

For this study, beta values for the sample banks have been calculated by regressing the monthly log returns of the sample banks’ stocks for the three year interval vis-à-vis the monthly log returns of CNX 500 index for the same interval to estimate the beta of a particular year.
Monthly returns of the stocks and market index have been calculated for each year beginning from 1st April of the previous years and ending on 31st March of the next year. The natural logarithmic differences in monthly closing prices of the stocks are used to measure the stock returns. Symbolically, the returns have been calculated as follows:

$$R_{it} = \ln \left( \frac{P_t}{P_{t-1}} \right)$$

Where $R_{it}$ is the return on stock $i$ in time period $t$, $P_t$ is monthly closing price of stock $i$ in the month $t$ and $P_{t-1}$ is the monthly closing price of stock $i$ in the month $t-1$. CNX Nifty 500 has been taken as the benchmark market index to calculate beta.

The market return was calculated as follows:

$$X_t = \ln \left( \frac{I_t}{I_{t-1}} \right)$$

Where $X_t$ is the log return on the market index in the time period $t$; $I_t$ is the monthly closing number of market index in the month $t$ and $I_{t-1}$ is the closing number of the market index in the month $t-1$.

### 3.9 Techniques of Measurement

#### 3.9.1 Measurement techniques for Shareholder Value creation

The measurement of shareholder value creation is done through two different methods i.e. Created Shareholder Value and Market Value Added.
3.9.1.1 Created Shareholder Value (CSV)

Created Shareholder Value is a method developed by Pablo Fernandez to measure shareholder value creation of an organization. According to Pablo Fernandez (2002), created shareholder value of a company can be calculated as given below. According to Fernandez (2002) a company creates value for the shareholders when the shareholder return exceeds the share cost (the required return to equity). In other words, the company creates value in one year when it outperforms expectations.

\[
\text{Created shareholder value} = \text{Equity market value} \times (\text{Shareholder Return} - K_e)
\]

Or

\[
\text{Created shareholder value} = \text{Shareholder value added} - (\text{Equity market value} \times K_e)
\]

In the above formula, the shareholder return is the shareholder value added in one year, divided by the equity market value at the beginning of the year.

\[
\text{Shareholder Return} = \frac{\text{Shareholder Value Added}}{\text{Equity Market Value}}
\]

3.9.1.2 Market Value Added

Market value added is a concept developed by Stern Stewart & Co. and may be defined as an aggregate net present value (NPV) of all the firm’s activities and investments. It represents the value created (or destroyed) over the lifetime of a firm and can be seen as a proxy for the past and current value of the firm’s strategies. It is calculated as the difference between the market value of equity and book value of equity. Thus, MVA is a kind of a bonus added on the market to the capital invested.

Analysis and evaluation of the process of creating shareholder value require introducing the definition of market value added for shareholders (MVA_E), which presents the difference between the market value of the firm’s stock and the amount of equity capital that was supplied by shareholders.
MVA_E = MV_E - IE

Where MVA_E = market valued added for shareholders
MV_E = the market value of equity
IE = the value of equity supplied by shareholders

MVA_E illustrates the difference between the amount of cash, which investors would receive if they sold their shares, and the capital which they have invested in the company. The application of MVA_E in the research will provide for an assessment of which companies are increasing shareholders’ values, and which ones are reducing it. It will also be a starting point to study the effects of shareholder value creation.

MVA_E assumes that future market value estimates are at fair value.

The interpretation of MVA is quite simple. A positive MVA signifies that a firm has created true wealth for its shareholders, since the company’s market value is greater than the book value of total capital employed in the business. On the other hand, when a firm has negative MVA, its market value is less than the capital that shareholders and bondholders invested, meaning that its managers have destroyed capital and squandered shareholder wealth. From the standpoint of assessing the performance of current management, the change in MVA over a period of one year or five years can be more significant than the absolute level of MVA. Thus, to increase the spread between invested capital and market value should be the primary objective of any company concerned about its shareholder’s welfare (Stewart, 1991). Moreover, as the definitive measure of wealth creation and as the ultimate goal in the wealth creation game; MVA could be used to directly compare the performance of companies in different industries or even countries (Ehrbar, 1998). For instance, MVA could be
used to compare say, a bank and a supermarket or a toy manufacturer and a food processor or a steel maker and a software company. Without a doubt, the one with the higher MVA created more wealth for its shareholders.

In this study, MVA has been chosen simply because it is a measure of value creation that reflects the cumulative wealth and as such is expected to reflect both tangible and intangible value. It is superior to simple market value as a performance measure because it removes capital employed in the firm away from the cumulative value created to demonstrate how well management has utilized its resources.

3.9.2 Statistical analysis with Mean, S.D. And C.V.

For the purpose of sector wise comparison and overall comparison of sample banks, the statistical measures like mean, standard deviation and coefficient of variations are used. The ranks of the banks are given on three bases. Mean shows comparison, S.D. shows variation while C.V. shows comparison of variation within the data. The formulae of these three statistical measures are given below.

Mean (X): \[\bar{X} = \frac{X_1 + X_2 + \ldots + X_n}{n} = \frac{\sum x_i}{n}\]

Standard Deviation (\(\sigma\)) = \[\sqrt{\frac{\sum (x_i - \bar{x})^2}{n-1}}\]

Coefficient of Variation (C.V.) = \[\frac{\text{Standard Deviation}}{\text{Mean}} \times 100\]

3. 9.3 Correlation Analysis

In the present study, correlation analysis has been used at first to measure the strength or degree of linear association between different variables. Secondly, it has been used to examine the direction of the relationship, i.e. whether two variables are positively correlated with each other or negatively.
3.9.4 T-test for Independent samples

In order to analyze statically significant difference between MVAs and CSVs of Indian public sector and private sector banks, t test has been used. The study uses t-test that assesses the statistical significance of the difference between two independent sample means. The t-statistic is the ratio of the difference between the sample means ($\mu_1 - \mu_2$) to their standard error (Hair et al. 2003). The standard error is an estimate of the difference between means to be expected because of sampling error, rather than real differences between means. It is calculated as:

$$t = \frac{\mu_1 - \mu_2}{\sqrt{SE_{\mu_1\mu_2}}}$$

Where $\mu_1 =$mean of group 1 (Created Shareholder Value of private sector banks)

$$\mu_2 = \text{mean of group 2 (Created Shareholder Value of public sector banks)}$$

Similarly, in the case of Market Value Added the t statistics is calculated as

$$t = \frac{\mu_1 - \mu_2}{\sqrt{SE_{\mu_1\mu_2}}}$$

Where $\mu_1 =$mean of group 1 (Market Value Added by private sector banks)

$$\mu_2 = \text{mean of group 2 (Market Value Added by public sector banks)}$$

If the t value is sufficiently large, then statistically it can be said that the difference is not due to sampling variability but represents a true difference. The decision regarding acceptance or rejection of the null hypothesis is made on the basis of obtaining t-statistic and its statistical significance. For each pair of observation in a table, the significance value (p value known as probability value) is provided for the hypothesis that there is no difference between the means of two independent groups. A lower p-value indicates a greater likelihood that the two figures compared represent real differences between the two categories (Malhotra and Singh, 2007)
3.9.5 Regression Models

Regression analysis is used to establish the relationship between MVA and other performance measures like ROCE, RONW, PAT, EPS and interest spread. It will help in identifying the key value driver which affects the shareholder value creation measured in terms of market value added. The following models are used to test the hypotheses to establish the relationship between MVA and these value drivers.

Model 1: \[ MVA_{it} = \beta_0 + \beta_1 \text{ROCE} + e_{it} \]

Model: 2 \[ MVA_{it} = \beta_0 + \beta_1 \text{RONW} + e_{it} \]

Model: 3 \[ MVA_{it} = \beta_0 + \beta_1 \text{PAT}_{it} + e_{it} \]

Model: 4 \[ MVA_{it} = \beta_0 + \beta_1 \text{EPS}_{it} + e_{it} \]

Model: 5 \[ MVA_{it} = \beta_0 + \beta_1 \text{Interest spread}_t + e_{it} \]

3.9.5.1 Dependent Variable

Market Value Added (MVA)

MVA being an absolute measure assesses that how much capital a company has added to or subtracted from its shareholders’ investment. It is the cumulative amount by which a company is perceived to have enhanced or diminished shareholder wealth. It is based upon the logic that if the total market value of a company is more than the capital invested in it, the company has managed to create shareholder value. However, if the market value of a company comes less than its invested capital, the company has destroyed value. MVA thus, measures the value added by the management over and above the capital invested in the company by its shareholders and lenders. For the purpose of the study, MVA is calculated by subtracting the book value of equity from the market capitalization.
MVA is the perfect summary assessment of corporate performance that shows how successful a company has been in allocating and managing resources to maximize value of the enterprise and the wealth of its shareholders (Stewart, 1994). In the present study, MVA being the surrogate of shareholder wealth addition has been taken as the dependent variable.

3.9.5.2 Independent Variables

i Return on Capital Employed (ROCE)

ROCE measures the profit which a firm earns on investing a unit of capital, and tells whether the company’s borrowing policy was wise economically and whether the capital had been employed fruitfully. If the long-term return of a business enterprise is not satisfactory in any case, then the deficiency need to be corrected and the activity can be abandoned for a more favorable one (Kishore, 2002).

Obviously, it is quite impractical to assess profits or profit growth properly without relating them to the amount of funds (capital) that were employed in making profits. ROCE is one of the most important profitability ratios which assess how much the capital invested has earned during the period. It is determined by dividing net profit or income by the capital employed or investment made to achieve that profit. ROCE analysis provides a strong incentive for optimal utilization of the assets of the company and is used as a measure of success of a business. For the purpose of the study, it is expected that ROCE will not only find a significant reflection in the market value addition of banks but will also be a significant predictor of the same.

ii Return on Net worth (RONW)

This ratio measures the relationship between net profits and shareholders’ funds and thus, reveals how well the firm has used the resources of the owners. So, this ratio is
of great interest to the present as well as prospective shareholders and also of great concern to management, which has the responsibility of maximizing the owners’ wealth. Further, RONW is also capable to reveal the relative performance and strength of the company in attracting future investments. RONW is therefore an important parameter for judging the performance of a company from the shareholders point of view. In general, shareholders continue to stay invested in a company as long as they are receiving a good return (Bardia, 2008). Thus, RONW is selected as one of the independent variable having positive relationship with MVA of a company. This variable is also a relative measure and has been expressed in percentage terms.

**iii Profit after taxes (PAT)**

It is the net profit earned by the company after deducting all expenses like interest, depreciation and tax. It is defined as: \( \text{PAT} = \text{EBDIT} - \text{Depreciation} - \text{Interest} - \text{Taxes} \) where EBDIT is earnings before depreciation, interest and taxes. PAT is expressed in absolute (Rupee) terms. It has been selected as an independent variable as normally it is expected to have a positive relation with the MVA i.e. increasing profitability in a well functioning capital market is likely to give a boost to share prices, market capitalization and market value added. A company whose profitability is not sufficient to cover up its overall cost of capital, face adverse EVA situation, the result of which is the decline in its stock prices and therefore, its market value also falls. For the purpose of the study, PAT figures are taken from the corporate database, Prowess.

**iv Earnings Per Share (EPS)**

EPS is an absolute measure of profitability that identifies how much each share has earned for the shareholders. Investors, in general, look upon earnings per share as the best yardstick to analyze their investment decisions. Generally it is believed that EPS
has a positive relationship with share prices and hence EPS (Reddy and Reddy, 2007). It is also considered as one of the major factors affecting the dividend policy of the firm and market prices of the company (Kishore, 2002). Thus, the study expects a positive association between EPS and MVA of a company and EPS has been taken as an independent variable affecting market value addition of a company.

**V Interest spread**

Interest spread is the excess of total interest earned over total interest expended. The ratio of interest spread to average working funds shows the efficiency of bank in managing interest expenditure and interest income effectively. Interest spread is critical to a bank’s success as it exerts a strong influence on its bottom line. The study thus investigates whether there exists a significant relationship between market value additions of the banks

**3.10 Limitations of the Study**

Following are the limitations noticed in the study.

- It is restricted to the financial data of 21 Indian banks, which are listed on the National Stock Exchange.
- The study is restricted to public and private sector banks operating in India. It thus does not consider foreign banks, regional rural banks and cooperative banks working in India.
- The data of listed sample banks for only 10 years from 2000-01 to 2009-10 are considered for the study. Therefore the results are restricted only to the banking sector for the selected period.
- Only those banks are selected in the sample for which data for the study period was available this might have resulted in sample bias.
• It will focus on public sector and private sector banks listed on the National Stock Exchange only and therefore does not represent unlisted banks or banks listed on other stock exchanges.

• There are many techniques of measuring value creation, but only two methods are used for the study.