

Potential, Challenges and Operation Performance Analysis of  
Small Business:  
With Special Reference to Telecommunication Components Sector  
of the United States of America

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# Acknowledgements

About 10 years ago I started my small company CSR Jewelry Design as I wanted to experience the challenge of having my own line of modern affordable jewelry and finding a place where these items could be produced, following my concept, and introducing them to the U.S. market.

Very soon I found out that I was not alone with this idea and that there are many others trying to do the same thing.

Some companies are small, some are large. Most of the affordable jewelry products come from places like India. So I decided to look at this as a challenge for an academic exercise after my MBA, first using this topic, which turned out to be too narrow in scope. After realizing this, I modified the topic in concert with Prof. Dr. rer. pol. habil. Daniel Baier. As my parents own a telecommunication components company (parts used for signal processing) in New Jersey, USA, I decided to conduct an analysis of small (less than 500 employees) and large companies.

Prof. Baier took a great interest in this topic and as a truly good advisor he recommended a variety of important and useful changes and additions.

As far as India is concerned, which I visited with my parents about two years ago, I met one of my suppliers there as well as Prof. K.V. Velayudhan, Ph.D. , Dept. of Economics and Finance, School of Business, of Montclair State University, New Jersey, USA, who got his MBA in the USA. We had many detailed discussions on the topic large versus small companies.

He is about to return to India to his family and I hope he will stay in touch as a point of reference in India.

I am sure I stretched my parents' patience quite a bit as well as many others' and I am grateful that some of my friends looked after my US grammar. I would like to thank them all!

Christina S. Rohde

## **Zusammenfassung**

Die Probleme der kleineren Hersteller von Telekommunikations-Komponenten (Signalverarbeitungs-Komponenten) waren und sind Gegenstand zahlreicher Diskussionen und Veröffentlichungen. In vielen Fällen entstanden solche Firmen aus den Ergebnissen von „Experimenten“ und scheiterten neben anderen Ursachen aufgrund eines ungünstigen Standorts. Schlechte Lage und mangelhafte Betriebsführung gepaart mit einem starken Wettbewerb und daraus resultierendem zu geringem Umsatz sind daher einige der Gründe für das Scheitern von kleinen Firmen. Auf den Weltmärkten müssen kleine Unternehmen außerdem mit ihren großen Wettbewerbern und vielen anderen kleinen Firmen konkurrieren. Marktneulinge müssen berücksichtigen, dass es sinnvoll ist, mit einer entsprechenden Strategie zu beginnen und diese sorgfältig umzusetzen.

Im Rahmen dieser Arbeit wurde die vorhandene Literatur nach Erfolgsmethoden analysiert, um herauszufinden, wie ein Überleben im globalen Markt sichergestellt werden kann, was möglich sein sollte, wenn klare Vorstellungen bezüglich der Potentiale und Herausforderungen für kleine Unternehmen bestehen.

Auf die relevante Literatur wird Bezug genommen und entsprechend kommentiert. Neben anderen Werken wurde Michael Porter's Buch „Wettbewerbsstrategie“ (1980 erschienen bei The Free Press, New York) herangezogen. Allerdings bezieht sich seine Theorie nur auf Unternehmen mit mehr als 500 Mitarbeitern. Er beschreibt zwei Konzepte, die in dieser Arbeit herangezogen werden: zum einen das Modell der Wertschöpfungskette und zum anderen das Modell der Marktkräfte.

Um diese Modelle zu unterstützen, wurden mehrere Leistungsindikatoren getestet, wie z.B. Marktanteil, Rendite des investierten Kapitals (ROI), Umsatz je Mitarbeiter, Wertschöpfung (der Mehrwert jeder Wertschöpfungsstufe ergibt den Gesamtwert des Produktes) und den Erfolg des Managements (Differenz aus Gesamterlösen und Gesamtkosten in Relation zu den Gesamterlösen).

Aus der Literatur-Recherche wird offensichtlich, dass einzelne Erfolgsmessgrößen nicht zwangsläufig die wirkliche Leistung des Unternehmens widerspiegeln müssen.

## Ziele der Studie

Die vorstehenden Ausführungen zeigen, dass die vorliegende Untersuchung sich mit dieser Aufgabe befasst. Um genauer zu sein, lauten die wichtigsten Ziele dieser Studie wie folgt:

1. Analyse der Herausforderungen und Potenziale von kleinen Unternehmen hinsichtlich der industriellen Entwicklung der USA
2. Analyse der Faktoren, die die Unternehmensleistung beeinflussen unter besonderer Berücksichtigung der kleinen US-amerikanischen Unternehmen im Bereich Telekommunikations-Komponenten

Hier sind organisatorische und finanzielle Faktoren sowie Wertschöpfungskette und Marktkräfte von Bedeutung.

## Forschungsfragen der Studie:

1. Die Ansichten der Befragten zu den Auswirkungen der operativen und finanziellen Faktoren auf die Leistung von kleinen Unternehmen im Bereich Telekommunikations-Komponenten zu ermitteln
2. Auf der Grundlage dieser Ansichten zu ermitteln, ob die Faktoren der Wertschöpfungskette eine Rolle spielen in Bezug auf die Leistung der kleinen Unternehmen im Bereich Telekommunikations-Komponenten
3. Auf der Grundlage dieser Ansichten zu ermitteln, ob die Marktkräfte sich auf die Leistung der kleinen Unternehmen im Bereich Telekommunikations-Komponenten-Firmen auswirken.

## Schlussfolgerung:

Das Hauptziel der Studie war es, die Beziehung zwischen Leistung einerseits und den organisatorischen und finanziellen Faktoren sowie den Faktoren der Wertschöpfungskette und der Marktkräfte andererseits zu untersuchen. Aus der vorgenommenen Analyse geht hervor, dass der Unternehmenserfolg direkt mit mehreren organisatorischen und finanziellen Faktoren in Zusammenhang steht. Die Beziehung zwischen der Leistung von kleinen Unternehmen und den Faktoren der Wertschöpfungskette wird ebenso verdeutlicht. Außerdem stehen geringe Leistung und die Marktkräfte in engem Zusammenhang. Diese Studie hat die Anwendung von Porter's Modellen der Marktkräfte und Wertschöpfungskette empirisch überprüft und den Einfluss der

Faktoren der Marktkräfte und Wertschöpfungskette auf die Leistung von kleinen Unternehmen analysiert. Ursprünglich wurde dies von Porter zur Analyse des Einflusses der Faktoren der Marktkräfte und der Wertschöpfungskette auf die Leistung von großen Unternehmen entwickelt. Die empirische Untersuchung zeigt, dass diese Modelle auf kleine US-Unternehmen im Bereich Telekommunikations-Komponenten übertragbar sind. Die Ergebnisse der Studie zeigen auch, dass ein zusammengesetzter Leistungsindex ein besserer Maßstab ist als einzelne Leistungsindikatoren.

## Summary

The problems of small companies in the telecommunication components sector (signal processing components) have been and are the subject of many discussions and publications. In many cases, such companies have been started based on past results of "experiments" and failed, amongst other things, because of bad location. Poor location and poor operation management along with strong competition resulting in low sales are some reasons of the failures of small firms. In global markets, small firms are additionally forced to compete with their large counterparts and many other small ones. The newcomer to this field has to consider that it is useful to start with an elaborate strategy and to carefully implement this.

Within the scope of this work the existing literature has been researched to find out successful methods to survive in the global market, which should be possible if there are clear ideas regarding the potential and challenges of small firms.

The relevant literature is referenced and commented upon. Amongst others we found "Michael Porter's Competitive Strategy" (1980, The Free Press, New York). However his theory has only been applied to companies larger than 500 employees. He has identified two models we will use, the value chain model and the market forces model.

In order to support these models, several performance indicators were tested, like market share, return on investment (ROI), revenue per employee (RPE), value added (VA), value added at each stage of progressing will be equal to the total value of the product) and return on management (total revenue less total cost divided by total revenue).

It is obvious from the literature review that individual performance measures not always need to convey the real performance of the firm.

### Objectives of the Study

From the foregoing discussion it is evident that the present study addresses itself to this task. To be more specific, the major objectives of the study are the following:

1. To analyze challenges and potential of small businesses regarding the industrial development of the U.S.
2. To analyze the factors influencing firm performance with special reference to the small telecommunication components companies of the U.S.

In this context, organizational and financial factors, value chain factors and market forces are important.

#### Research Questions of the Study:

1. To determine the opinions of the respondents on the impact of the operational and financial factors on the performance of small telecommunication components companies
2. Based on the opinions, determine whether the value chain factors play any role on the performance of small telecommunication components companies
3. Based on the opinions, determine whether the market forces have any impact on performance of small telecommunication components companies

#### Conclusion:

The main objective of the study was to examine the relationship between performances on the one hand and organizational and financial factors as well as value chain factors and market forces on the other hand. It is apparent from the above analysis that company performance is directly related to several organizational and financial factors. The relationship between small firm's performance and value chain factors is also evident from the analysis. Besides, small performance and market forces are closely related. This study empirically tested the application of Porter's market forces and value chain models in analyzing the influence of market forces and value chain factors on small firm performance. It was originally developed by Porter to analyze the influence of market forces and value chain factors on the performance of large businesses. The empirical analysis shows that these models can also be applied to small U.S. companies in the telecommunication components sector. Results of the study also indicate that composite performance index developed is a better measure than individual performance indicators.

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## **List of Acronyms**

BP:	Buyer Power
CC:	Current Competition
CEO:	Chief Executive Officer
CF:	Competitive Forces
CP:	Complementary Product
CPI:	Composite Performance Index
FF:	Financial Flexibility
GDP:	Gross Domestic Product
HR:	Human Resources
IFR:	Infrastructure
IL:	Inbound Logistics
IT:	Information Technology
MS:	Market Share
NE:	New Entry
OF:	Operational Flexibility
OL:	Outbound Logistics
OLS:	Ordinary Least Squares
OP:	Operation Resources
PR:	Procurement
R&D:	Research and Development
ROA:	Return on Assets
RCF:	Reconstruction Financial Corporation
RoCF:	Return on Cash Flow
ROE:	Return on Equity
ROI:	Return on Investment
ROM:	Return on Management

ROS: Return on Sales  
RPE: Return per Employee  
SM: Sales and Marketing  
SME: Small and Medium Company  
SOA: Sales over Assets  
SBP: Substitute Product  
SF: Structural Flexibility  
SP: Supplier Power  
SPSS: Software Program for Social Sciences  
SR: Services  
STF: Strategic Flexibility  
TD: Technological Development  
TS: Total Sales  
VC: Value Chain

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# Chapter 1

## Introduction

### 1.1 The Context of the Study

The term operation performance is generally used to express effectiveness of the firm (business) in organizing and transforming inputs into goods and services, and marketing it to achieve targeted goals over a given period of time (Nickell 1996, Nickell et al. 1997). Operation performance of the firm in a free market economy like United States depends on its organizational efficiency, value chain factors and competitive ability. Although studies on operation performance have assumed increasing attention, in the analysis of business growth there is no universally accepted indicator to measure firm performance (Audretsch 2001, Baum and Wally 2003, Chaston 1997, Cool and Schendel 1987, Eisenhardt 2013, Kochhar 1997). Market Share (MS), Return on Investment (ROI), Return on Management (ROM), Value Added (VA), productivity and profitability are some of the important indicators that are used in general (Goren et al. 1994, Gunes et al. 2003, Jones and Tilley 2003, Peffers and dos Santos 1996 and Strassmann 1990). Further, most of the studies have been carried out on analyzing operation performance of large firms and no serious attempt has been made in the context of small business. However many of the conclusions drawn based on studies of large firms are not applicable to the small firms due to several factors (Verdu-Jover et al. 2006).

Small firms (firms with less than 500 workers in U.S.) are different from their large counterparts (firms with 500 workers or more) for various reasons. Primarily, organization structure of the small firm is different from that of large firm (Athey and Roberts 2001, Chaston 1997, Jensen and Meckling 1992, Meijaard et al. 2005, Mintzberg 1979). The deficiency in specialized managerial skill is another challenge of small firms (Baldwin 1993, Shrader, Mulford and Blackburn 1989). Small firms are able to attract and retain highly skilled and competent personnel (Kroon, Voorde, and Timmers 2013, Miller and Toulouse 1986, Orser, Hogarth-Scott and Riding 2000). Regardless of these challenges small firms are forced to compete with small competitors and large counter parts with all aforesaid advantages in global market along with domestic markets as a result of newly emerged global economic system. To survive in these market small firms need to introduce potential marketing strategy. The study is an attempt to carry out a small firm performance analysis selecting appropriate performance measures

## **1.2 The Background of the Study**

Small business acts as a force of economic development, employment generation, and technological innovation in developing as well as the developed economies. Small firms contribute a significant share of the Gross Domestic Product (GDP), employment generation, and technological innovations. Further, they provide opportunities to expand the entrepreneurial base and required flexibility to adapt to market changes. Their contribution in developing policies is oriented towards decentralization and rural development. Besides, they support large-scale enterprises and enter into market niches, which are not profitable for larger enterprises (Tolento 2000). Though industrialization does bring the large manufacturing units, small industry by no means disappears from the highly industrialized countries like United States. In addition, small firms in countries like United States are modern in nature, different from those in traditional economies. Small firms in these countries use most modern technology, equipment and methods (Kochhar 1997, Stanley and Morse 1965). These are the factors that help them to compete with their counter parts in large business if they are able to exploit the potential effectively.

Small firms play a significant role in economic development of the United States. Their contributions in employment generation and the Gross Domestic Product are remarkable. They are providing a good number of patenting in various inventions in different sectors. Currently, more than half of the small businesses fail within a period of five years (Kaiser 2011, SBA 2008). According to SBA (2005) lack of financial resources is one of the main reasons for this high rate of failure. The poor location and operations management along with competition and low sales are some of the other reasons for failures of the small firms. In view of Baldwin et al. (2004) small businesses typically are less productive, less capital intensive, pay lower wages and are more likely to fail. Now small firms have new avenues in the global market as a result of newly emerged global economy. Small firms can exploit the global market if they adopt the perfect market strategy.

## **1.3 Statement of the Problem**

Small firms contribute a significant share of Gross Domestic Product, private employment and new inventions in several countries including United States of America, which implies growth and development of small firms. Small firms are important for economic development of the developed countries as well as developing countries. Globalization opened new markets to the small business along with their domestic markets. However, in the global market small firms are

forced to compete with their large counterparts along with small competitors. Small firms are required to develop effective competitive market strategy to survive in the global market, which is possible with clear idea regarding potential and challenges of small firms. This study is an attempt to help small firms in this direction.

## 1.4 Research Design of the Study

The design of the work is presented diagrammatically as follows. The details of the methodology are discussed in Chapter 4.

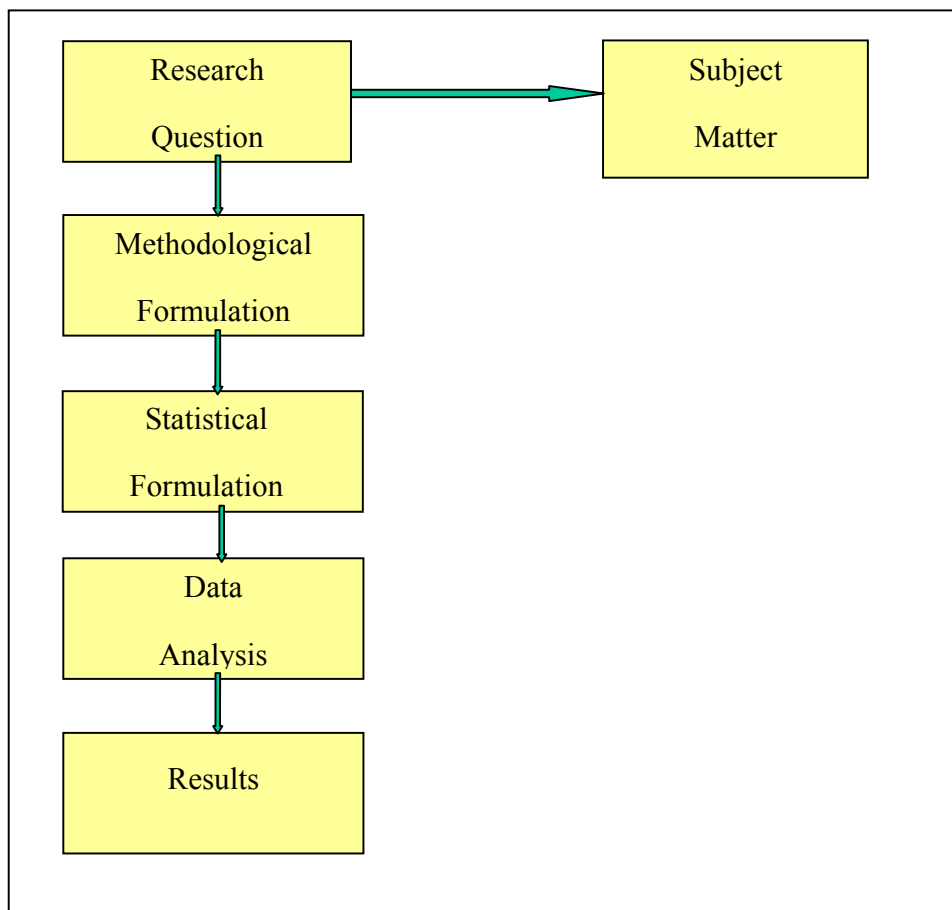


Figure 1.1 Diagramming of the study

## **1.5 Research Questions of the Study**

1. To determine the opinion about the impact of the operational and financial factors on performance of small telecommunication components companies
2. Based on the opinions, determine whether the value chain factors play any role on performance of small telecommunication components companies
3. Based on the opinions, determine whether the market forces have any impact on performance of small telecommunication components companies

## **1.6 Objectives of the Study**

From the foregoing discussion it is evident that the current understanding of the present study addresses itself to this task. To be more specific, the major objectives of the study are the following:

1. To analyze challenges and potential of small businesses with reference to the industrial development of the U.S.
2. To analyze the factors influencing firm performance with special reference to the small telecommunication components companies of the U.S.

## **1.7 Hypotheses of the Study**

In view of the aforementioned questions, the research examines the following hypotheses:

1. The null hypothesis associated with operation and financial factors ( $H_0$ ): operation and financial factors (operational flexibility, structural flexibility and strategic flexibility) will have no significant impact on performance of small firms.

$$H_{0a}: b_1 = b_2 = b_3 = b_4 = 0$$

$$H_{1a}: \text{At least one } b_i \neq 0$$

2. The null hypothesis associated with value chain factors ( $H_0$ ): value chain factors (inbound logistics, operation resources, market & sales, infrastructure and HR) will have no significant impact on performance of small firms.

$$H_{0b}: c_1 = c_2 = c_3 = c_4 = c_5 = c_6 = c_7 = c_8 = c_9 = 0$$

$$H_{1b}: \text{At least one } c_i \neq 0$$

3. The null hypothesis associated with market forces ( $H_0$ ): market forces (supplier power, buyer power, current competition, new entry, substitute product and complementary product) will have no significant impact on performance of small firms.

$$H_{0c}: d_1 = d_2 = d_3 = d_4 = d_5 = d_6 = 0$$

$$H_{1c}: \text{At least one } d_i \neq 0$$

## 1.8 Areas and Scope of the Study

The study is confined to the small telecommunication components firms in the United States since the research focused on private small firms is a tedious task due to: 1. unmanageable in numbers and 2. limitations of collecting information from private firms.

## 1.9 Method of Analysis

The current study proceeds in two different phases. The first phase is based on the secondary sources of information associated with small business. This section examines journal articles, government reports and statistics and published and unpublished research dissertations. This investigation is used to develop framework of the current study. Further, it is used to figure out potential and challenges of small business. The second phase of the study is empirical analysis of the primary data collected from field survey.

The primary data from the selected sample units is collected using pre-tested questionnaires. The questionnaires are mailed to the senior executives of the small firms. The information thus collected is used for further empirical analysis. The analysis proceeds in three different but interrelated stages. While the first stage examines demographic of the sampled units the second stage analyzes the influence of various factors on firm performance. For the performance analysis individual indicators along with composite index is used as performance measures. The

market share, return on investment, revenue per employee, value added and return on management are indicators individual indicators used in this study to measure firm performance.

Internal consistency reliability of the data is tested with the help of Cronbach's alpha before performing analysis. Multiple regression models are used to analyze nature and strength of the relation between explanatory and explained variables. The impact of organizational and financial factors on performance is examined first which is followed by the analysis examining impact of value chain factors and market forces on performance.

### **1.10 Chapter Scheme and Structure of the Study**

This study is presented in six chapters. Chapter 2 reviews business performance studies, which focused on performance studies of small business. Chapter 3 examines growth dimensions of small business in which the potential and challenges of small business are investigated with the help of previous studies. Chapter 4 deals with the discussion of research methodology; the theoretical background, method of the study and important concepts. Chapter 5 is devoted to the discussion on empirical analysis and finding. Finally, Chapter 6 recapitulates the major findings of the study.

## Diagramming Dissertation

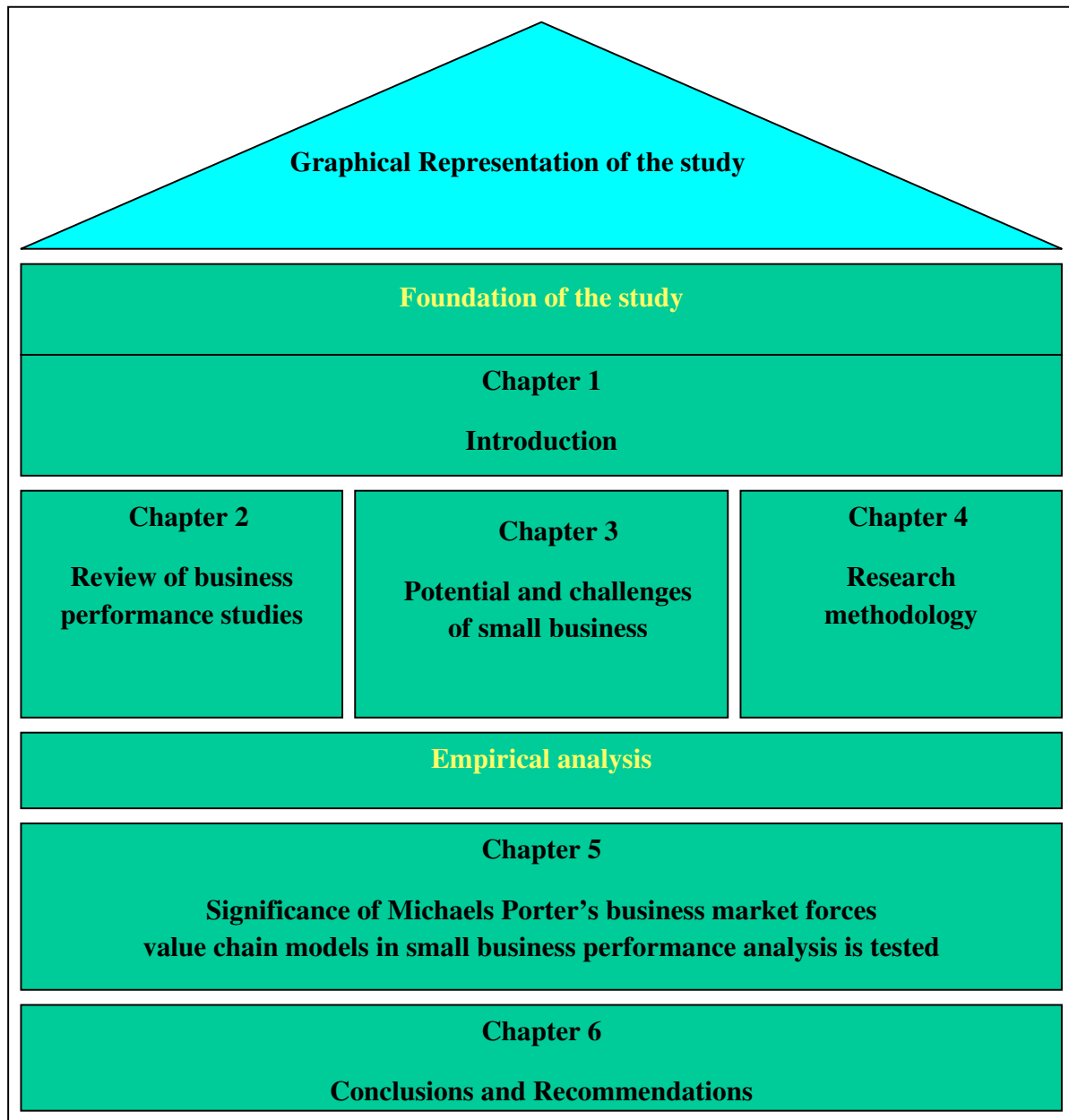


Figure 1.2 the structure of the work



## **Chapter 2**

### **Review of Business Performance Studies**

#### **2.1 Introduction**

This chapter begins by reviewing relevant literature of performance studies, which is important for selecting relevant indicators to measure operational performance. Operational performance of the firms depends mainly on effective resource management and strategic decision-making since these are the two factors influence success of the business (Guest 2009, Letza 1996, Richard et al. 2009). Hence performance assessment is important for effective resource management and strategic decision-making. Although performance measure is decisive for business development, there is no standard set of indicators or specific methods for choosing performance indicators (Smith and McKeen 1991). The perfection of the operation performance study depends on the selection and use of appropriate performance measures, which is a difficult task. Several researchers are seen to have used different indicators individually or jointly to overcome this challenge. Sales, total assets, market value, return on equity, turnover, profit, investment sales, employment, revenue per employee, return on asset, profitability, revenue, market share, liquidity, solvency and productivity are the most popular measures used to measure firm performance. However, use of traditional measures like profitability has been criticized for being focused on too narrow aspects of the firm activities. This chapter reviews some of the recent business performance studies to get more insight on various performance measures used in those studies. This study proceeds in two sections: first section reviews business performance studies conducted in the context of the United States whereas the second section examines non-American studies. The literature reviews in the context of the United States is important since the current study focuses on small business in the United States. However, literature reviews in the context of other countries are also important since it gives international perception regarding performance studies. Finally, the major observations of literature reviews are also given in a separate overview section.

#### **2.2 Business Performance Studies of the United States**

Agrawal and Knoeber (1996) studied performance of the U.S. largest companies using sale, total asset, and profit as performance measures. The objective of the study was to examine the

connection between performance of the firms with a mechanism to control the agency problem between managers and shareholders. They have used sampling procedure in this study to collect data from 500 sample units for further empirical analysis. They have empirically analyzed the relationship between firm performance and the extent to which the various control mechanisms are motivated towards performance. Their findings suggest that cross sectional OLS regression of firm performance on single mechanism may be misleading. Greater use of one mechanism need not be positively related to firm performance. The empirical analysis revealed statistically significant relationship between firm performance and insider ownership, outside representation on the board of directors, debt financing, and corporate control activity. Also they found a greater insider ownership was positively related to performance, while more outsiders on the board, more debt financing, and greater control activity were negatively related to performance.

Bae et al. (2008) studied the performance of U.S. manufacturing firms using both accounting and market-base measures such as sales, R&D, ROE, ROA, ROS and five year sales growth of the firms. The main objective of this study was to analyze the role of multinationality and R&D intensity on performance of the firm. They have used survey method in this study to collect primary data. They have identified 2025 firms, those highly invested for R&D, and focused on international market. Final information collected from 672 out of the 2025 firms identified for detailed investigation has been used for empirical analysis. The analysis of data using various statistical tools revealed that a firm's multinationality is significantly related to greater firm performance. They have used individual measures to evaluate the performance of the firm that is the important limitation of this study

Baum and Wally (2003) investigated performance of the U.S. firms using growth and profit as performance measures. The main objective of the study was to examine the impact of the strategic decision making speed on firm performance. Primary data was collected from 318 firms using questionnaires during the period from 1997 and 2001. Structural equation modeling has been used in this study for further analysis. The analysis revealed that fast strategic decision-making predicts subsequent firm growth and profit, and mediates the relation of dynamism, munificence, centralization, and formalization with firm performance. The measures they used individually need not give overall performance of the firm.

Berger and di Patti (2003) studied performance of commercial banks using profit efficiency (standard profit efficiency and alternative profit efficiency) to measure agency costs and return on equity. In this study they used annual information of 695 U.S. commercial banks over the period from 1990 through 1995, taken mostly from the reports of income and condition. The finding of the study reveals that a lower equity capital ratio is associated with higher profit

efficiency. The effect is economically significant as well as statistically. The historical data used in this study need not give current period performance of the commercial bank and the limited number of traditional indicators is not sufficient to show its overall performance.

Brush, Bromiley, and Hendrickx (1999) studied performance of U.S. business using ROA and debt asset ratio as performance indicators. The main goal of the study was to measure the relative influence of industry and corporation on business segment performance. They have used two data sources (the FTC Line of Business data base and the COMPUSTAT industry segment data base) in this study for empirical analysis. Using a simultaneous equation model, they estimated the influence of industry and corporation on business unit performance. The result of the empirical analysis revealed that both corporations and industries influence business unit profitability but corporations have the larger influence. In this study they have mainly used traditional performance measures to assess performance.

Carton and Hofer (2005) identified distinct dimensions of both organizational and financial performance measures. In this study, the researchers have developed a model of overall organizational performance and subsequently tested it empirically. For the purpose of empirical analysis they have collected data from 2894 firms, which are included in Standard and Poor's listings for the period of four years. The model they developed demonstrated that organizational financial performance is a multidimensional construct. Ten out of the thirteen constructs and twenty out of the original thirty measures were retained in the annual financial performance measurement model. It was also demonstrated that these constructs were discriminant and that the measures of the constructs met the test for convergent validity. The model revealed that the simultaneous consideration of these multiple dimensions is more appropriate for drawing conclusions about the effectiveness of managerial actions than considering each performance dimension separately.

Cosh et al. (2012) examined the relationship between organizational structure and innovation performance of small and medium firms in United Kingdom (UK). The main goal of the study was to investigate whether there is any relationship between innovation, performance, and organization size or age of the firm. The analysis of the primary data using various statistical tools such as logistic regression analysis revealed influence of decentralized decision making on innovation performance. Further, the study revealed greater innovative tendency of the young firms operating in high technology sectors with informal structure, which implies structural rigidity, reduces innovativeness of the firm.

Cool and Schendel (1987) studied performance of U.S. Pharmaceutical Industries using three different sets of performance variables; market share (MS), weighted segment share (WSS), and inflation-adjusted return on sales (AROS). The main objective of the study was to examine the role of strategic group on performance of the pharmaceutical industries. They have employed a sample survey method to gather information for further analysis. Data collected from sample of 22 firms was used in the empirical analysis. The results of the empirical analysis depicted significant difference in market share between groups whereas no significant difference was seen in profitability between groups.

Dollinger (1985) examined financial performance of small firms using sales and net income as performance indicators. The main objective of this study was to examine environmental contact and the financial performance of the small firm. The researcher used the survey method to collect primary data for empirical investigation. Different types of small business organizations were selected at random from telephone directories in Allentown-Bethlehem Easton, Pennsylvania. Various statistical tools were used for the purpose of empirical analysis. The results of the analysis revealed that the boundary spanning activity (contact with environment) of the entrepreneur is positively correlated with a firm's financial performance. The main limitation of this study is that they have used only two traditional variables to assess performance of the firm.

Eisenhardt (2013) examines influence of managerial ability on firm performance. The author synthesized evidence from several studies to sharpen when and how top management teams influence the performance of entrepreneurial firms. The study revealed success of the large and diverse teams with a history of working together. Precisely, it is apparent from this study that top management teams emerge as central to the success of entrepreneurial firms.

Greenwood et al. (2005) studied performance of professional service firms in U.S. using revenue per employees as the performance indicator. The main focus of this study was to examine the influence of various factors like reputation, diversification, and organizational structure on performance of these firms. The researchers tested the hypothesis that professional service firms (PSFs) managers face a choice in designing structures between the retention and motivation of the professional workforce and transferring knowledge from partners to other professionals. They tested this hypothesis with help of the data collected from the largest 100 accounting firms for the period 1991-2000. The result of the empirical analysis revealed that reputation, diversification, and organizational structure have a significant impact on performance of these firms. They have used an individual indicator to measure the firm's performance.

Hawawini et al. (2003) studied the relative impact of industry against firm level factors shaping firm performance. In this study the researchers focused on U.S. based non-financial and non-government corporations that have at least \$100 million in sales. They have used return on asset (ROA) as a performance measure. The researchers collected information from 2686 business units operating in 84 industries using the sampling technique. The analysis demonstrated that variance in firm performance attributable to industry-level factors increases, while variance attributable to firm-level factors decreases when 'exceptionally' higher and lower-performing 'outlier' firms in each industry are excluded. For most of the firms except notable leaders or losers, the industry effect turns out to be more important for performance than firm-specific factors. In this study also researchers are seen to have used single indicators to measure firm performance.

Hendricks and Singhal (2008) examined performance of publicly traded firms in the U.S. using return on assets (ROA), return on sales (ROS) and sales over assets (SOA). The sampling method is used for collection of data for further investigation. Information from 450 publicly traded firms regarding product introduction delays were used for empirical analysis. The result of the analysis revealed that delays have a statistically significant negative effect on profitability. More precisely, product introduction delays have negative impact on SOA and ROS. The researchers in this study have used the traditional financial indicators for measuring performance of the firm.

Hopkins and Hopkins (1997) analyzed performance of U.S. banks using return on equity (ROE) as performance measure. The main goal of the study was to examine the relation between strategic planning and financial performance of banks. The researchers have used the survey method to collect data for empirical investigation. The data collected from 112 banks out of the 350 selected samples was analyzed using various statistical tools. The result of the analysis indicated that the intensity with which banks engage in the strategic planning process has a direct, positive effect on banks' financial performance. Results also indicated a reciprocal relationship between strategic planning intensity and performance. In this study, they have used only one traditional indicator to measure performance of the firm.

Ittner et al. (2003) examined performance of financial service firms in U.S. using return on assets, sales and returns on stock as performance indicators. The main objective of this study was to examine the relationship between measurement system satisfaction, economic performance, and two general approaches to strategic performance measurement. The researchers have used primary data that was collected from the 140 U.S. financial services firms using sampling techniques for empirical analysis. The analysis revealed that a variation of the measurement

diversity approach has the strongest association with stock market performance. However, the results showed little evidences that strategic performance system (SPM) practices are associated with ROA and sales growth. The endogeneity of the predictor variables and difficulty to get the exact performance information are some of the limitations reported in this study.

Jayaraman et al. (2000) studied financial performance of U.S. firms using the stock market valuation and holding period returns. The primary objective of the study was to examine the role of founder managers on firm performance. Sampling procedure has been used in this study for collecting data. A sample of 47 firms with founder managers and the same number of firms with non-founder managers were selected for empirical analysis. The result revealed that the founder manager is positively related to the stock performance among smaller and younger firms where as it is negatively related to the stock performance among larger and older firms. They have used limited number of performance indicators in the study, which is not sufficient for making a specific conclusion in this regard.

Jemison (1987) examined performances of U.S. banks using return on assets and risk as performance measures. The main objective of this study was to analyze the relationship of risk with strategy, organizational processes, and performance of banks. The researcher used sampling procedure for collecting data for analysis. A sample of 20 banks was taken from a population of 43 Indiana banks with the assets in the range of \$125 and \$550 million in 1979. Information regarding these banks for the period of five years from 1975-1979 was collected for further empirical analysis. The analysis with the help of various statistical tools revealed that organizational processes and strategy are related to both return and risk. In this study the researcher tried to incorporate risk with dimensions of performance in strategic management research. However, for performance analysis researchers are not seen to have used this as an indicator.

Marlin et al. (2007) studied performance of U.S. hospitals using operating margin, return on assets and profit per patient as performance measures. The main goal of the study was to examine the relationship between equifinality and strategic groups' performance. The sampling technique is used in this study for collecting data for empirical investigation. The study sample consisted of all general, short-term, acute-care hospital in a single southern state of America for 1983, 1988, and 1993. They have used various statistical tools like principal component analysis for empirical investigation. The results revealed that the industry movement between equifinal states could have a rather dramatic effect on both industry and organizational performance.

Montgomery and Wernerfelt (1991) investigated performance of U.S. brewing industry using market share and return on stock as performance measures. To examine the source of the performance was the main objective of the study. The researchers have used sampling techniques to conduct a field survey. The capital asset pricing model (CAPM) has been used in this study to measure changes in firm value. The primary data from the selected six major public traded firms in U.S. brewing industry for the period between 1969 and 1979 has been collected for detailed analysis. The analysis revealed that market share gains in this industry during the study were not correlated with changes in value and that the performance of individual leading firms was highly correlated with changes in value. The main focus of this research was the financial aspect of the business.

Muse et al. (2005) analyzed organizational performance of U.S. small firms using return on assets, return on sales, return on cash flow, and employee growth. They have employed sampling technique to collect information for empirical analysis. The target population of this study was all for-profit, non-financial, non-farm business enterprises that had fewer than 500 employees and were in operation as of the year-ended 1992. A sample of 4637 small firms was taken from the National Survey of Small Business Finances. The researchers have used logistic and linear regression models for analyzing the organizational commitment of employees and hierarchical regression model for analyzing the relationships between organizational commitment of employees (OCE) and each of the measures of company performance. Result of the analysis showed a positive relationship between some of the OCE variables and performance of the company (ROS, RCF, productivity, and employee growth). The results of the analysis indicated that some of the performance measures are better suited to capture the relationship between OCE and enhanced worker performance.

Newbert et al. (2007) studied performance of semiconductor silicon industries using sales and life span as performance indicators. The researchers have carried out an empirical investigation using historical data. Their analysis revealed that firms emphasizing technology-push strategies perform better than firms emphasizing demand-pull strategies. They also found that firms founded on management capabilities emphasized demand-pull strategies at founding, whereas firms founded upon technological companies emphasize technology-push strategies at founding.

Ogawa and Tanaka (2013) examined how small and medium-sized enterprises in Japan managed global financial crisis. The study was based on the survey data collected of Research Institute of the Economy, Trade and Industry in 2008 and 2009. The researchers identified three shocks (demand shocks, supply shock and financial shocks) of SME from survey data. The empirical analysis revealed that demand shock was the most prevalent among the shocks that hit the SMEs,

while the financial shock was least frequent. SMEs were able to overcome this crisis with their strong customer relationship. Customer-supplier relation was the strength of SMEs in mitigating the supply shock.

Orpen (1985) examined performance of small firms in U.S. using sales and return on asset. The researchers examined the difference in performance of small firms with long term planning and without long term planning. They have carried the analysis using the primary data collected from a sample survey. Fifty-eight small businesses were selected for the study. The data collected through pre-tested questionnaires and the daily diary entries of the managers were used for empirical analysis. The analysis of data using various statistical tools revealed that the extent of long-range planning was unrelated to performance of the small firm.

Pelbani (2000) analyzed performance of small manufacturing firms in U.S. using business position variables (marketing/sales effectiveness and growth/share) and profitability. The researcher used the sampling techniques in this study. The sample size of the study was twelve hundred industrial manufacturing firms from Ward's Directory of U.S. public and private companies with sales in the range of \$12 to \$20 million. The study sample represented eight industry sectors: plastics, fabricated metal, basic metals packaging, chemicals, instruments machinery, and electronic/electrical equipment. Data received from two hundred and thirty-five firms are used for further analysis. Seven point Likert scale is used to obtain the response from the respondents, which is analyzed using various statistical tools for analysis. The results of this study showed the strong influence of market orientation on firm performance.

Qian et al. (2010) studied the performance of U.S. based Multinational Enterprises using ROA as performance measure. They used sampling procedure to collect data from 123 U.S. based multinational enterprises (MNEs) over a seven-year period of 1999-2005. The samples were selected using the criteria of an MNE by having at least 10 per cent of their total sales derived from foreign operations and possessing operations within at least six countries. This information was collected from the firms' 10-K filings, Moody's Industrial Manuals, and the annual World Bank's World Development Reports. The analysis of data revealed that performance increases at an increasing rate as firms concentrate more heavily on intra-regional diversification. Regarding inter-regional diversification and total geographic diversification, they found inverted-U relationships to exist between firm performance and the level of geographic diversification. This study emphasized the importance of open economy.



Rassenfosse (2012) studied potential of SMEs in exploiting their intellectual property rights. The empirical analysis of the study was based on the data from an international survey conducted by the European Patent Office. The analysis using various econometric models revealed that small and medium-sized enterprises (SMEs) are much stronger reliance on 'monetary patents' than large companies. It is also revealed that SMEs tend to use their patents more actively than large firms. It is also apparent from the study that smaller companies generally have a higher proportion of their portfolio that is licensed, but the licensing rate is significantly higher in the USA. An American SME is twice as likely as a European SME to have a high share of its portfolio that is actually licensed, witnessing a fragmented market for technology in Europe.

Rothaermel et al. (2006) examined performance of the global microcomputer industry using total revenue. The secondary data has been used for empirical analysis of this study. The researchers have used data from various sources such as Lexis/Nexis, Compustat, the U.S. Patent and Trademark Office etc. for detailed analysis. The results of the empirical analysis of the global microcomputer industry revealed influence of vertical integration and strategic outsourcing on firm performance.

Schilke et al. (2009) analyzed performance of the U.S. firms using multidimensional construct; customer satisfaction, market effectiveness, and profitability. The main objective of the study was to examine the relationship between international marketing standardization and firm performance. They conducted a large-scale survey among firms from various industries: consumer packaged goods, pharmaceuticals, consulting, retailing, telecommunications/information technology, and utilities to collect data for empirical analysis. In survey process they have received information from 489 units out of 2,549, representing a response rate of 19 per cent. Prior to conducting this detailed survey they have administered a pilot survey so as to get specific ideas about the population. The analysis revealed that standardization has a greater impact on performance for larger firms than for smaller firms.

Segal et al. (2009) studied the performance of U.S. natural food industry using earnings, net worth, cash flow, market share, and sales volume. Sampling method is used in this study to gather primary information for detailed analysis. Data from sixty firms, members of the Natural Products Association (NPA), a trade association for the U.S. natural food industry is collected. The authors used regression analysis to assess the ability of the model to explain firm performance, the dependent variable. The current study demonstrated that the human capital of entrepreneurs influence significantly the performance of their firms. Entrepreneurs who possess the potent, synergistic combination of education with industry managerial experience have the competencies and capabilities to manifest better results. Both education and managerial

experience were found to have a positive impact on firm performance. The result also found that firm performance is highly correlated to managerial experience rather than the level of education. This study attempted to connect knowledge economy with business.

Smith and McKeen (1991) examined the effect of information technology on business performance using return on investment, return on assets, productivity, revenue growth rates, return on management and profit as performance measures. The main objective of this study was to find out the impact of information technology on values of the business. The analysis concluded that revenue per employee is the best available measure because this reflects both revenue growth and increased productivity.

Waddock and Graves (1997) analyzed performance of U.S. firms using return on assets, return on equity, and return on sales. The main goal of the study was to measure the link between corporate social performance (CSP) and financial performance. Using the sampling procedure the researchers have collected data from 469 firms for detailed empirical analysis. The results of the analysis revealed that corporate social performance positively associated with financial performance.

Zahra and Covin (1993) examined performance of U.S. firms using return on sale (ROS) as the performance indicator. The main objective of the study was to analyze relationship among business strategy, technology policy and firm performance. The researchers collected primary data from the field using questionnaires for empirical analysis. In order to collect the information, the questionnaire was directed to the CEO or the highest-ranking official of the 368 companies having direct involvement in formulating company's strategy and policy. The analysis of data using various statistical tools revealed that technology policy choices vary widely across firms with different business strategies, and that business strategy affects the strength of the relationship between firm performance and technology policies.

The previous literature review revealed that there is no single method or criterion for measuring firm performance. The brief lists of indicators that are used by different researchers in their studies are given in Table 2.1. Researchers, in general, used individual indicators to measure performance of firms and multiple or composite indicators are not common.

Table 2.1 Various measures used in firm performance, Selected U.S. studies

<b>Author and Year</b>	<b>Performance Measures</b>	<b>Journal</b>
Agrawal and Knoeber (1996)	Sales, total asset and profit	Journal of Financial and Quantitative Analysis
Bae et al. (2008)	Sales, ROE, ROA and ROS	Multinational Business Review
Baum and Wally (2003)	Growth and profit	Strategic Management Journal
Berger and di Patti (2003)	Profit efficiency, ROE	Working Paper
Brush et al. (1999)	ROA and Debt asset ratio	Strategic Management Journal
Cool and Schendel (1987)	MS and ROS	Management Science
Dollinger (1985)	Sales and net income	Journal of Small Business Management
Greenwood et al. (2005)	Revenue per employee	Organization Science
Hawawini et al. (2003)	Sales and profit	Strategic Management Journal
Hendricks et al. (2008)	ROA, ROS and SOA	Management Science
Hopkins and Hopkins (1997)	ROE	Strategic Management Journal
Ittner et al. (2003)	ROA, sales and returns on stock	Journal of Management Accounting Research
Jayaraman et al. (2000)	Stock value and returns	Strategic Management Journal
Jemison (1987)	ROA and Risk	Management Science
Marlin et al. (2007)	Operating margin, ROA and profit	Journal of Managerial Issues

<b>Author and Year</b>	<b>Performance Measures</b>	<b>Journal</b>
Montgomery and Wernerfelt (1991)	MS and Returns on stock	Management Science
Muse et al. (2005)	ROA, ROS, employee growth etc.	Small Business Economics
Newbert et al. (2007)	Sales	Journal of Small Business Management
Orpen (1985)	Sales and ROA	Journal of Small Business Management
Pelbani (2000)	Sales, growth/share, and profitability	Journal of Small Business Management
Qian et al.(2009)	ROA	Strategic Management Journal
Rothaermel et al. (2006)	Total Revenue	Strategic Management Journal
Schilke et al. (2009)	Customer satisfaction, market effectiveness and profit	Journal of International Marketing
Segal et al. (2009)	Earnings, net worth, cash flow, market share and sales volume	Journal of Management and Marketing Research
Smith and McKeen (1991)	ROA, ROI, productivity and revenue	Proceedings of 27 Hawaii Conference
Waddock and Graves (1997)	ROA, ROE and ROS	Strategic Management Journal
Zahra and Covin (1993)	ROS	Strategic Management Journal

### **2.3 Non-U.S. Business Performance Studies**

Aydin et al. (2007) studied performance of manufacturing industries in Turkey using marketing performance, innovation, product design capability and new product development cycle times as performance measures. The main objective of the study was to examine the relationship between marketing and product development process and their effect on firm performance. A sampling procedure was employed in this study for collecting primary data for empirical investigation. The researchers collected primary data from 85 sample units consisting of the food, textile, chemicals, basic metal, transport equipment, machinery and equipment, rubber, paper, paper products, wood and wood products industries. They used various statistical tools like regression model for empirical analysis. The analysis revealed new product development cycle time has a non-statistically significant positive effect on a firm's performance. Also the result of the study revealed that marketing performance, innovation capability and product design capability affect a firm's performance.

Beise-Zee and Rammer (2006) analyzed export performance of German manufacturing and service industries using export to turnover ratio as performance indicator. The main goal of the study was to measure local user-producer interaction in innovation and export performance of the firm. The researchers used data of 4786 manufacturing and service industries from the German innovation survey for empirical analysis. The analysis revealed that innovation and user-producer interaction influence export performance of the firms. Analysis of data also revealed that a higher specialization of a home market on specific products and export activities of customer industries have a significant positive effect on exports. Further, innovation activities positively affect export performance, but there is no influence of exports on innovation. In this study the researchers used only individual indicators to measure firm performance.

Brouthers et al. (2003) examined performance of Central and Eastern Europe (CEE), German, Dutch, and British firms using composite performance index. The main goal of the study was to analyze transaction cost enhanced entry mode choices and firm performance. A sample survey method is used for collecting primary data for empirical investigation. The researchers surveyed 1190 Dutch, German and British firms. They used various statistical tools like ordinary least square (OLS) regression method for further analysis. The results revealed that firms that used transaction cost (TC) enhanced international entry modes perform better than firms using other modes of entry. Although they have used composite index for measuring performance of the firm this study mainly focused on the international scenario.

Chiao et al. (2006) investigated performance of small and medium enterprises in Taiwan using return on sales (ratio of net income to total sales). The main intention of the study was to find performance, internationalization and firm-specific advantages of SMEs in a newly industrialized economy. They have employed sampling techniques in this study to collect information from 898 electronic and 618 textile industries. The analysis revealed that there is an inverted U-shaped curvilinearity between internationalization and performance, a U-shaped curvilinearity between advertising investment and performance, and positive linearity between performance and R&D investment. Here the researchers have used advertisement as one of the important variables in connection with performance analysis, which need not give the real level of firm performance.

Chou and Lee (2008) studied performance of Taiwanese non-financial companies using return on equity (ROE) as the performance measure. The researchers used the sample survey method in this study for collecting data for analysis. They have studied the capital structure of 37 non-financial companies listed in the Taiwan 50 and 89 non-financial companies listed in the Taiwan Mid-Cap 100 from 1987 to 2007. The analysis revealed a strong curvilinear relationship between ROE and the debt-to-assets ratio. It also revealed a positive relation between corporate performance and the capital structure. In this study they have only traditional individual performance indicators to measure firm performance.

Ciszewska-Mlinaric and Mlinaric (2010) examined performance of Slovenian small and medium enterprises using ROE, value added per employee, sales, ROS and ROA as performance measures. The main objective of this study was to examine the significance of managerial resources for SMEs internationalization, and verifies the relationship between the level of the firm's internationalization and performance. They have used sample survey method in this study. In this regard they have administered a questionnaire and conducted a pilot survey to ensure the quality of the final data. Data collected from 291 firms selected from the primary screening have been used for the final analysis. The results of the data analysis using various statistical tools revealed significant relationship between internationalization and performance of firms.

Fairoz et al. (2010) examined performance of small and medium business in Sri Lanka using sales, employment, profit, market share and owner/managers' satisfaction as the performance indicators. The main objective of the study was to analyze entrepreneurial orientation and business performance. Sampling procedure was used to collect the data from manufacturing industries for analysis. Qualitative and quantitative techniques were used in this study. Statistical tool like multiple regression analysis was used to determine the relationship among entrepreneurial orientation dimensions and business performance. The results of the analysis

revealed a certain level of positively significant relationship between pro-activeness and business performance. However, performance of the firm did not show significant relationship with innovativeness, risk taking and entrepreneurship.

Gelderen et al. (2000) studied performance of small firms in the Netherlands using turnover, profit, investments, personnel, and personal income. The main goal of the study was to investigate strategies, uncertainty and performance of small business startups. Sampling procedure was used in this study for empirical investigation. The researchers randomly selected sample firms with less than 50 employees started during the previous five years. The analysis of the longitudinal data revealed that the process characteristics of action strategies predict entrepreneurial success and vice versa. The result of the analysis revealed that the relationship between firm performance and process characteristics of action strategies predict entrepreneurial success and vice versa.

Gibson and Cassar (2005) studied performance of Australian small firms using sales and employment as performance indicators. The main objective of this study was to analyze the relationship between planning and performance of small firms. Longitudinal data with responses from 2,956 firms over a four-year period provided by the Australian Bureau of Statistics (ABS) are used for empirical analysis of the study. The performance analysis provided the evidences concerning the sequence of the relationship between planning and performance. The individual performance measure used in this study need not give overall performance of the firm.

Hart and Tzokas (1999) examined performance of SME in the United Kingdom (UK) using the ratio of export sales to total company sales and the ratio of export profits to company profits. They have collected data from fifty exporting UK SMEs. They used direct mailing procedure to collect the data from selected units to analyze the impact of marketing research on export performance. The study examined whether differences in the way export information is used are related to measure of export performance. The results of analysis indicated that export marketing information is related to export success.

Koc (2011) measured performance of small manufacturing enterprises in Turkey using profitability as performance indicator. The main objective of the study was to examine the relationship between total quality management (TQM) and performance in small manufacturing enterprises. Survey method has been used to collect data from small and medium sized enterprises (SMEs) in three organized industrial zones in Istanbul. The sample consisted of 111 manufacturing units that have implemented TQM practices in various degrees. The analysis

using various statistical tools such as multiple regressions, factor analysis revealed that there is a significant relationship between the TQM practices and firm performance. This researcher, as in the case of several other researchers in the previous studies, used an individual indicator to measure firm performance.

Lee et al. (2009) studied performance of small firms in Korea using sales as a performance indicator. The researchers have carried out a pilot survey to ensure quality of the data that they collected from 698 respondents. The result of the analysis using various statistical tools revealed that information technology (IT) knowledge contributes to the overall performance of small firms. More specifically, individual IT knowledge, both traditional and electronic communication methods, significantly contributed to the financial performance of the firms.

Meijaard et al. (2005) studied performance of Dutch small firms using sales, profitability and innovativeness as performance measures. They have employed stratified sampling technique in this study to collect data from 1411 units. Various statistical tools like factor analysis and regression analysis were used for the data analysis. The analysis revealed the relationship between organizational structure and firm performance.

Obloj et al. (2010) studied performance of small and medium firms in Poland using revenue, profit and market share as performance indicators. The main objective of this study was to examine the impact of dominant logic on performance of firms in a transitional economy. The researchers have used multi-stage sampling procedure to select units for detailed investigation and collection of data for empirical investigation. The primary data collected from 653 sample units from media, food and beverages, consulting and market research, efficacy construction materials, outsourcing and tourism were used for further analysis. The result revealed that a dominant logic characterized by external orientation, proactiveness, and simplicity of routines significantly influenced the performance of the firms.

Orser et al. (2000) studied performance of Canadian small and medium business using changes in revenue in two consecutive fiscal years as performance measure. The empirical analysis is based on a random survey of 1,004 small and medium-sized Canadian businesses. The telephone survey was conducted in late 1994 and early 1995 on a sample of small companies randomly selected from the Dun and Bradstreet commercial database. This study found that growing firms tended to be younger companies while firms in decline were comparatively older; and the presence of a business plan was highly correlated with performance.



O'Sullivan et al. (2009) analyzed performance of firms in Europe using sales, profit, ROA and stock returns as the performance indicators. The main goal of the study was to compare marketing performance measurement and firm performance. The researchers have used primary and secondary data to measure firm performance. They have conducted a pilot survey before conducting a detailed survey to ensure quality of the information. The main questionnaire was divided into four sections containing questions relating to marketing performance measurement capabilities, marketing performance reporting practices, firm performance and respondent profile based on the requirement of the study. The researchers used various statistical tools for data analysis, which showed that marketing performance measurement ability positively influenced firm performance.

Park et al. (2006) studied performance of manufacturing enterprises in China using ROA and sales per employee as performance measures. They examined the effect of market liberalization in profitability and productivity of Chinese firms. They also studied the relation between ownership and the performance of state-owned enterprises. They used data from 23,577 firms provided by the Database of Industrial Firms in China (DIF) and the China Statistical Yearbook for the period 1992-1996. They have analyzed the data using various tools like Cobb Douglass Production function, which revealed that the market liberalization in China influenced significantly the firm performance.

Pattnaik and Elango (2009) analyzed performance of Indian manufacturing firms using return on equity (ROE) as performance indicator. The main purpose of this study was to examine the impact of firms' resources on internationalization and performance relationship in the context of Indian manufacturing firms. The researchers used secondary data collected from Center for Monitoring the Indian Economy (CMIE) for empirical analysis. Data from 787 manufacturing firms with annual sales of at least 50 million Indian Rupees during the period 2000-2003 were used for empirical investigation. The results of the empirical analysis using various statistical tools revealed a non-linear relationship between internationalization and performance. Also the results indicated that firms initially gain performance benefit from international operations, but after a point, they face declines in benefits from internationalization.

Peng and Tan (2003) studied firm performance of state owned enterprises in China using profitability and market position, on a five-point scale. They used both primary and historical data for the empirical analysis. They have collected primary data from 57 units and archival data from 1532 units. The analysis revealed that organization theory generates strong predictions

when dealing with unabsorbed slacks while agency theory yields strong validity when focusing on absorbed slack. Further, the impact of slack on performance is curvilinear.

Roper (1998) examined performance of small firms in Ireland using sales and turnover as performance measures. Sampling procedure was used in this study and collected primary data from manufacturing companies with 10 to 100 employees, which had been trading for at least four years. The analysis of the data using various statistical tools showed that different entrepreneurial characteristics influenced firm performance.

Ruigrok et al. (2007) studied performance of Swiss multinational manufacturing industries using ROA. The main objective of the study was to measure the impact of internationalization on performance of firm. The primary data collected from 87 Swiss medium and large firms over the eight-year period from 1998-2005 have been used for this study. With the help of various statistical tools they have analyzed the primary data, which revealed that the companies highly focusing on internationalization face lower average performance and higher average performance variation.

Sels et al. (2006) examined performance of small firms using voluntary turnover, labor productivity and profitability. They have surveyed organizations with 10 to 100 employees. They collected information from the bel-first data files, which contain information from certified financial statements. They used an economy-wide and disproportionally stratified random sample, with age and size as stratification variables. Three strata of company size were identified: 10–19, 20–49 and 50–99 employees. The results of the analysis showed that human resource management (HRM) intensity positively influenced productivity and, through this productivity, a squeezing effect on personnel costs/value added.

Su et al. (2011) studied performance of firms in China using profitability as the performance indicator. The main objective of this study was to examine entrepreneurial strategy making, resources, and firm performance. The questionnaire survey research method was used in this study. They have collected data from 204 firms for the period 2006-2007. The researchers used various statistical tools for data analysis. Results of the analysis reveal that entrepreneurial strategy management (ESM) has a significant positive influence on firm performance.

Tan and Peng (2003) studied performance of Chinese electronic industry using return on asset and market position. The researchers have analyzed the impact of organizational slack on firm

performance using primary and secondary data. Various statistical tools are used in empirical analysis of the study. The results of the analysis revealed that both organization and agency theories are insightful to help probe into the relationship between organizational slack and firm performance during economic transitions.

Thomsen and Pedersen (2000) analyzed economic performance in the largest European Companies using market-to-book value of equity, return on assets, and sales growth. The main objective of the study was to analyze the impact of ownership structure on economic performance of European companies. The researchers have used a database containing information on ownership structures of the 100 largest non-financial companies in 1990 in each of 12 European nations: Austria, Belgium, Denmark, Finland, France, Germany, the United Kingdom (UK), Italy, the Netherlands, Norway, Spain and Sweden. They linked this database to performance measures for a sub-sample of 435 companies collected from Worldscope database. The analysis revealed a positive effect of ownership concentration on shareholder value and profitability but the effect levels off for high ownership shares.

Tzung-Ming and Chaang-Yung (2011) examined performance of insurance companies in Taiwan using 24 financial ratios. The main objective of the study was to assess performance of insurance companies using grey relation technique. Sampling procedure has been employed in the study and selected companies recruited during the period from 2004-2008. The researchers have used grey relational analysis on the ground that it is highly reliable and a calculation-friendly measurement tool, which is commonly used to strengthen the efficiency of factor analysis and to forecast the flops of businesses performance analysis. The researchers ranked the performance of selected insurance companies with the help of grey relation grade calculation. The researchers suggested using grey relation grade for the business performance evaluation of insurance companies since they are useful to measure not only ranking of business performance but also the analysis of weightings between factors.

Van et al. (2004) analyzed the performance of service firms of Germany for the period 1994-2000 using sales as the performance indicator. The researchers used data from two sources (Markus database and ZEW Centre for European Economic Research) for empirical analysis. Data from 7566 usable observations was employed for further analysis. The result of the analysis revealed that the firm size has positive effect on performance; young firms outperform older competitors, a single creditor has a stabilizing effect, diversification has a negative impact, and performance is significantly affected by legal status.

Venaik et al. (2005) studied performance of multinational subsidiary firms using market share, sales growth and return on investment. The main goal of the study was to analyze the impact of global pressures on multinational corporation (MNC) subsidiary conduct and performance. A stratified random sample of MNC subsidiaries was selected from the Dun and Bradstreet World Base for empirical investigation. The primary information received largely from Japanese, UK and U.S. MNCs consisted of 163 cases. The partial least squares (PLS) approach to structural equation modeling is one of the tools they used in this study for empirical analysis. The study revealed that subsidiary autonomy has a significant and sizable positive relationship with marketing innovation and inter-unit learning has a significant positive relationship with subsidiary performance.

Verdu-Jover et al. (2006) analyzed performance of large and small firms in European Union using return on asset, return on sales as performance indicators. The researchers examined environment-flexibility co-alignment and performance of small and large firms. They have used sampling procedure in this study and conducted a survey for collecting primary data. They selected a sample of 3,411 units from the population of 68,299 companies. The analysis revealed that good alignment between actual and required flexibility has a greater influence on business performance in the case of small firms.

Wengel et al. (2006) studied performance of small and medium enterprises (SME) in Indonesia using productivity as the performance indicator. The main goal of the study was to analyze export performance of the firms in Indonesia. In this analysis they have used the latest available data for more than 20,000 industrial enterprises in Indonesia from the Annual Manufacturing Survey of 1996 and 2000 produced by the Central Bureau of Statistics. Various statistical tools were used in this study for empirical analysis, which revealed that the small firms with higher use of machinery and domestic inputs displayed a higher likelihood to increase the share of their output exported. The result also showed that firms in export-oriented sectors with more exporters and more foreign investment, or firms with more access/use of credit, tend to export a higher share of their output irrespective of their size.

Zhou et al. (2011) analyzed performance of financial enterprises in China using ROA, ROE, asset quality and solvency. The main objective of the study was to measure impact of executive payment on performance of the financial enterprises. The researchers used secondary data collected from the records of banks. Data from sample of 18 banks for the period from 2001-2009 were used for further analysis. They have used various statistical tools like regression for data analysis. The result of the study showed no significant relation between bank performance and managers' compensation, and neither any impact of compensation changes on performance.

However, performance of non-performing loan ratios and ROE has significant effect on director's compensation.

Table 2.2 Firm Performance Measures used in selected non-U.S. Studies

<b>Author and Year</b>	<b>Performance Measures</b>	<b>Journals/Conference Proceedings</b>
Aydin et al. (2007)	Market Performance, Innovation, Product Design Capability	Academy of Marketing Study Journal
Beise-Zee and Rammer (2006)	Export Turnover Ratio	Small Business Economics
Brouthers et al. (2003)	Composite Index	Strategic Management Journal
Chiao et al. (2006)	ROS (ratio of net income to total sales)	Small Business Economics
Chou and Lee (2008)	Return on Equity	International Conference Proceedings
Ciszewska-Mlinaric and Mlinaric (2010)	ROE, Value Added, Sales, ROS and ROA	Managing Global Transitions
Fairoz et al. (2010)	Sales, Profit and MS	Asian Social Science
Gelderen et al. (2000)	Turnover, Profit and Investment	Small Business Economics
Gibson and Cassar (2005)	Sales and Employment	Small Business Economics
Koc (2011)	Profitability	International Journal of Industrial Engineering
Lee et al. (2009)	Sales	Small Business Economics
Meijaard et al. (2005)	Sales and Profitability	Small Business Economics
Obloj et al. (2010)	Revenue, Revenue Sales and MS	Entrepreneurship Theory and Practice
Orser et al. (2000)	Revenue	Journal of Small Business Management

<b>Author and Year</b>	<b>Performance Measures</b>	<b>Journals/Conference Proceedings</b>
O'Sullivan et al. (2009)	Sales, Profit, ROA and Stock Returns	European Journal of Marketing
Park et al. (2006)	ROA and Sales per Employee	Journal of International Business Studies
Pattnaik and Elango (2009)	ROE	Multinational Business Review
Peng and Tan (2003)	Profitability and Market Position	Strategic Management Journal
Roper (1998)	Sales and Turnover	Small Business Economics
Ruigrok et al. (2007)	ROA	International Review
Sels et al. (2006)	Turnover, Labor Productivity and Profitability	Small Business Economics
Su et al. (2011)	Profitability	Small Business Economics
Tan and Peng (2003)	ROA and Market Position	Strategic Management Journal
Thomsen and Pedersen (2000)	ROA and Sales	Strategic Management Journal
Tzung-Ming and Chaang-Yung (2011)	Financial Ration	The Journal of Grey System
Van et al. (2004)	Sales	<i>Journal of Business &amp; Economic Statistics</i>
Venaik et al. (2005)	MS, Sales and ROI	Journal of International Business Studies
Verdu-Jover et al. (2006)	ROA and ROS	JSBM
Wengel et al. (2006)	Productivity	Small Business Economics
Zhou et al. (2011)	ROA, RON Equity and Asset Quality and Solveny	Asian Social Science

## 2.4 An Overview of the Literature Review

The previous section examined various business performance studies carried out in the United States and other countries. Irrespective of country of origin, in general, researchers have adopted objective approaches to measure operational performance of the firms, such as return on assets (ROA) (Bae et al. 2008, Brush et al. 1999, Ciszewska-Mlinaric and Mlinaric 2010, Hendricks et al. 2008, Ittner et al. 2003, Jemison 1987, Marlin et al. 2007, McNamara and Duncan 1995, Muse et al. 2005, Orpen 1985, O'Sullivan et al. 2009, Park et al. 2006, Qian et al. 2009, Ruigrok et al. 2007, Smith and McKeen 1991, Tan and Peng 2003, Thomas and Pedersen 2000, Waddock and Graves 1997, Zhou et al. 2011), return on sales (ROS) (Bae et al. 2008, Capar and Kotabe 2003, Ciszewska-Mlinaric and Mlinaric 2010, Cool and Schendel 1987, Hendricks et al. 2008, Muse et al. 2005, Waddock and Graves 1997, Zahra and Covin 1993) and Return on Investment (ROI) (Venaik et al. 2005), Return on Equity (ROE) (Bae et al. 2008, Berger and di Patti 2003, Hopkins and Hopkins 1997, Waddock and Graves 1997), profitability (Hart and Tzokas 1999, Koc 2011, Meijaard et al. 2005, Peng and Tan 2003, Sels et al. 2006 and Su et al. 2011) and sales (Agrawal and Knoeber 1996, Bae et al 2008, Ciszewska-Mlinaric and Mlinaric 2010, Dollinger 1985, Gibson and Cassar 2005, Hart and Tzokas 1999, Hawawini et al. 2003, Ittner et al. 2003, Lee et al. 2009, Meijaard et al. 2005, Newbert et al. 2007, Ohloj et al. 2000, Orpen 1985, O'Sullivan et al. 2009, Park et al. 2006, Pelbani 2000, Roper 1998, Segal et al. 2009, Thomas and Pedersen 2000, Venaik et al. 2005).

There are three common approaches seen in literature in measuring firm performance. The first approach is to use a single performance measure (Hawawini et al. 2003, Hillman and Keim 2001, Roberts and Dowling 2002, Spanos, Zaralis and Lioukas 2004) and the second approach is to use several measures to compare with different dependent variables but identical independent variables (Baum and Walley 2003, Contractor et al. 2003, Miller 2004, Peng 2003, 2004). The third approach is to use aggregate dependent variables, assuming convergent validity based on the correlation between the measures (Cho and Pucik 2005, Goerzen and Beamish 2003, Matear et al. 2003). This is most common with subjective measures of performance where the investigator is seeking something akin to trait-based psychometric validity (Varadarajan and Ramanujam 1990). The justifiability of these approaches depends crucially on whether the specific measures used meet the theoretical, statistical, and psychometric assumptions. Some researchers used objective measures of performance—accounting and financial market measures, plus firm survival—followed by subjective and quasi subjective measures—such as survey-based

self-reports and Likert responses. These measures target the financial, product market and shareholder outcomes that constitute performance (Richard, Devinney, Yip and Johnson 2009).

Managers and analysts often use ROA and ROS as measures of management efficiency and effectiveness (Grant et al. 1988, Penman 1990, Robins and Wiersema 1995). While some studies have made the use of ROA and ROS simultaneously (Grant 1987), some others used ROA only (Hitt et al. 1997). Some researchers are of the view that accounting profits are better measures in reflecting the effects of corporate strategy than stock prices (Grant et al. 1988). Further, it is argued that ROS is more appropriate to international business studies because it is reported in terms of the foreign exchange spot rate, which is generally regarded as a more accurate reflection of current operations (Geringer et al. 1989). Some researchers have criticized accounting based measures of performance (Aaker and Jacobson 1987) and some others (Doyle 1994) criticized the use of traditional measures such as profitability for being focused on narrow aspects of the firm performance. They believe that emphasis placed on traditional measures is inconsistent with their strategic importance. Responses to these inadequacies have included the development of improved financial metrics such as economic value measures and measures which include non-financial information (Ittner and Larcker 1998).

The aforesaid review revealed that the selection and identification of the performance indicators vary depending on the area in which research has been carried out. The researchers have used different indicators to measure firm performance in strategy, finance, economics or marketing. Further, there is no single appropriate indicator that can be used to measure firm performance. Composite index, single or more individual indicators are used in different studies to measure performance. Further, Michael Porter's (1980) value chain and market forces method are not used as a framework in any of the previous studies. In this study Porter's value chain and market forces model is used as the theoretical frame of the work. A composite performance index along with a set of individual indicators such as market share, return on investment, revenue per employee, value added, return on management, is used to measure firm performance.



## **Chapter 3**

### **Growth Dimensions of Small Business**

#### **3.1 Introduction**

Small business plays a significant role in economic development of developed countries as well as the developing economies. They contribute a remarkable share of the Gross development products (GDP) of several countries including the United States of America. Further, their role in employment generation, new inventions and innovations is commendable. It is argued that small businesses are having various organizational advantages to overcome growth hurdles of their larger counterparts. Further, they have several challenges in the market places in the emerging global market. Due to these reasons, over the past few decades, policy makers and researchers are seen to have given great importance to studying various features of small business (Blackford 2003).

This chapter of the thesis is devoted to examining various dimensions of the development of small business. While the Section 3.2 examines potential and challenges of small business - potential of organizational flexibility and invention and innovation along with challenges from government policies, operational challenges, financial challenges and marketing challenges - the Section 3.3 focuses on small business development in developed countries like England, Germany and Canada. This section is devoted to investigate small business development in the United States of America. In this section an attempt is made to investigate the historical evolution of small business in the U.S., government intervention in small business development, role of small business in American economy and role of small business in critical inventions.

#### **3.2 Potential and Challenges of Small Business**

Small business plays an important role in industrialization of developed countries and contributed significantly in new inventions of various technologies. For example, American business was small business before starting large scale railroad and telegraph industries in the United States. Although the introduction of large industries controls the economy of the country,

small business is still playing an important role in the life of American people. The small firms are having certain advantages over their large counterpart and also they have certain limitations. This section examines potentials of small business along with their challenges.

### **3.2.1 Potential of Small Business Growth**

Small firms and large firms have different organizational structures. The large businesses have wide organizational structure with different layers of management groups with different levels of decision-making capacities. Decisions regarding any issue are to be taken with the consent of various level management groups. Usually, policy decisions are taken at the corporate level, which is time consuming. On the other hand small businesses are owned and managed by the limited number of people, which enables them to make decisions very fast. In addition to this organization flexibility small business make several new inventions and generate large number of employment opportunities. This section examines the potential of small business in terms of organizational flexibility, employment generation and innovation.

#### **3.2.1.1 Organizational Flexibility**

Small firm management basically differs from that of large firms and many conclusions drawn in the context of large firms are not fit for small firms. Organization flexibility, the ability to adopt changes in the environment that require rapid reactions, is regarded as one of the advantages of the small firms (Aaker and Mascarenhas 1984, Goll and Rasheed 1997, Mahmood and Mann 1990). Organizational flexibility increases operational flexibility of the firms as far as managerial decisions and client decisions are concerned, which in turn helps to make managerial decisions without much delay. In other words, organizational flexibility reduces time lag of managerial decision-making in various levels (Ashmos et al. 1998, Halberg 2000, Venkat and Ramanujam 1986). Organizational flexibility is recognized as the key source of competitive advantage for most small businesses. Also, it is argued that the organizational flexibility enables small firms in adapting market mechanism, changing direction quickly at low cost and exploiting the best options for making meaningful productivity gained in the global marketplace (Amason and Mooney 1999, Jones and Tilley 2003).

It is argued that the innovative advantages of small firms are derived from their flexible managerial structures, which are more responsive to changes in the marketplace (Ashmos et al. 1998, Rothwell 1989 and Vossen 1998). The new inventions enabled small firms the

development of small-scale, flexible production technologies, which in turn enabled them to flourish in the manufacturing industry (Acs and Audretsch 1987, 1990, 1993, Acs et al. 1994). It would appear that the ability to develop and transfer technology is a distinctive competency of small firms. Further, the operational, tactical, and strategic advantages were instrumental for flexible and affordable manufacturing of small firms (Carlsson 1989, 1990). The flexibility fostered in small manufacturing firms has enhanced their productivity (Moran 2005, Walters 1998). Further evidence of small business productivity has been provided by numerous studies (Acs and Audretsch 1987, Almeida and Kogut 1997, Pratten 1991).

Another advantage of organizational flexibility of small firms is that it enables them to introduce new technology first. Further, it enables them to diffuse new and complex technologies at early stage but large companies do not adopt the high-risk technologies first (Julien and Ramangalahy 2003, Meijaard et al. 2005, Morck and Yeung 1991, 1992, Porter 1980, Woo and Cooper 1981, ). Organizational flexibility of small business reduces time lag to introduce the new technology, which in turn influences their performance. The timely introduction of new technology is important for the firms that are competing with other firms and their larger counterpart to get a lead in the market (Cragg and King 1988). On the other hand organizational rigidity of large firms increases time lag to introduce changes.

### **3.2.1.2 Potential of Inventions and Innovations**

The industrial revolution of the eighteenth century and subsequently emerged large scale production created a wide change in world economy, which in turn led to marginalize small firms that had been playing a significant role in the economy previously. Although the presence of the large firms raised challenges to small firms they could continue their critical role in inventions of the eighteenth century. Baumol (2005) has given striking evidences regarding contribution of small firms in important inventions. He has provided evidences indicating relative share of critical inventions of small and large firms. According to Baumol (2005), private innovative activity has been divided by market forces between small and large firms, with each tending to specialize in different parts of risk. Although the preponderance of private expenditure on Research and Development (R&D) is provided by the giant enterprises, the small firms have contributed a critical share of the innovative breakthroughs of recent centuries. Further, the innovative small firms grow faster than non-innovative firms (Foreman-Peck 2013, Roper 1997). This section briefly examines potentials and challenges of small firms.

Small firms are effective innovators in some ways better than large firms and produce twice as many innovations per employee compared to their larger counterparts. While the large firms are risk averse in their R&D activities and use innovative breakthroughs making cumulative increment improvements on inventions, small firms were willing to take challenges of risk, which enabled them to contribute a critical share of the innovative breakthroughs of recent centuries (Baumol 2005). Further, small firm contribution to innovation is most intense in leading edge technologies and they pursue leading-edge technical niches, perhaps in more complex technologies. The small firm's innovation is more extensively linked to outside technology while large firms build more on their own technology. They are largely thought to be more innovative than larger firms for three reasons: a lack of entrenched bureaucracy, more competitive markets, and stronger incentives (such as personal rewards) (Edmiston 2007, Halberg 2000, Moge 2000, 2003). As is seen in the previous section managerial flexibility is one of the reasons for reduced bureaucracy control leading to accelerate inventions.

Schumpeter (1942), the renowned economist and advocate of market economy, emphasized the interrelation between market economy and innovation. The industrial revolution and subsequent growth of large firms subsided importance of small business, which forced them to emphasize innovation for survival in the market economy. Further, innovation of small firms is important not only because of its direct contribution to the competitiveness of those companies but also because of the potential for the small firm sector to act as the initiator, catalyst and medium for wider technical change (Roper 1996). They are generating several cutting edge inventions and are acting as a source of constant experimentation and innovation to the economy (Clark, III and Moutray 2004, Fernández-Ribas 2010, Robbins et al. 2000).

Small businesses, it is argued, are indeed crucial innovators in today's economy and they are the technological leaders of many industries. They are effective innovators and important to the economy as an agent of a change and their contribution to innovation is most intense in new technology. They produced more highly cited patents than their large counterparts. The small firm patents are twice as likely as large firm patents to be among the one per cent most cited patents and they are seen more technically important than large firm patents (CHI 2003). In emerging technologies, small-firm patents outperform those of large firms in categories such as originality and citations (Breitzman and Hicks 2008). Besides, they are more innovators than their large counterparts in terms of new products (Fernández-Ribas 2010, Hansen 1992). While large firms produced a larger number of per firm patents than small firms, its per employee patent contribution is less than small firms (Audretsch 2002). Forty per cent of the companies that issued at least 15 patents over a five-year period were small businesses (CHI 2003, Moutray 2008). Small firms are playing an important role for knowledge spillovers and technological

change and are tied into regional knowledge networks to a greater extent than large firms (Almeida and Kogut 1997, Audretsch 2002). Further, small firms are the early users of new technology even if they are located outside an urban area (Karlsson and Olsson 1998). They, also play a crucial role in the process of creative destruction because the diffusion of property rights, along with bureaucratic inertia and other problems characteristic of large firms, dampen the potential innovator's incentives to be creative. It is argued that smaller firms are better at creating radical innovations because they better protect the innovator's property rights (Acs et al. 1997).

### **3.2.2 Challenges to the Small Business Growth**

In the aforesaid section, an attempt has been made to analyze the potential of small business. Along with these potentials they have several challenges (Kbrasniqi 2007, Kotey 2005, Leonidou 2004, Leyden and Albert 2004). One side they have to face market challenges from their small business competitors along with their large counterpart. In addition to this challenge they have several challenges resulting from government policies periodically. Further, they have to overcome operational, financial, and marketing challenges. Operational challenges force them to introduce economies of scale, which is usually not easy due to various resource constraints. Finance is another area in which small business faces challenges since they don't have enough avenues to mobilize finance compared to their larger counter part. Besides, small firms are having various marketing challenges. This section examines these challenges in brief.

#### **3.2.2.1 Challenges from Government Policies**

Government policies and regulations are influencing the growth of small firms and hence small firm entrepreneurs are very much concerned with governmental decision. Small business owners frequently cite tax and regulatory policies as one of the main issues since they affect their business conditions and entrepreneurial activity. It is argued that small businesses face disproportionately higher compliance costs per employee than their larger counterparts when complying with federal regulations (Crain 2005). The cost and availability of health insurance has long been another concern for small business owners. The cost of providing health insurance to employees and increasing coverage will remain a priority. The premium increases have forced small business owners to make changes to the coverage they offer to their workers, including sharing the cost of coverage with their employees, pursuing lower cost options such as consumer-driven plans, or choosing not to offer health coverage at all (Moutray 2008a).

### **3.2.2.2 Operational Challenges of Small Business**

Small firms are not capable of using maximum economies of scale due to their limitation of implementing increased speed through repetitive performance of specialized task. Shortage of skilled labor, qualified management, and appropriate equipment curtail advances in production technology of small firms (Stanley and Morse 1965). Further, small businesses must compete for skilled labor with their larger counterparts. This is more difficult in the light of disparity in total compensation, especially benefits, and the result is greater employee turnover. Labor shortages suggest that firms may engage in bidding wars for skilled workers, and small businesses are sometimes at a competitive disadvantage (Cromie 1990, Moutray 2008a, Steers 1975). Specialized management functions permit more effective performance in accounting, budgeting, personnel selection and planning and control whereas small firms have relatively little specialization in management. In the midst of these problems large firms attract skilled and talented people offering high wages and additional benefit, which is not affordable for the small firms in general. As a result, small firms face shortage of qualified management, which is a main hurdle of small business growth. Generally, the manager and a few assistants handle production, finance, purchasing, HR, sales and all other aspects of the business.

Offshore outsourcing is widely accepted as a business model for making significant level of profit margin by shifting business operations to offshore locations of the developing countries (Gamble, R. 2003, Gupta 2006 and Norwood 2006). International movement in favor of globalization along with widespread use of internet, standardization of software development methodologies, abundant supply of skilled labor, efficient project management techniques, and low cost of telecommunication are some of the factors in favor of this move. Also, the large companies are given incentives to outsource the activity, choosing to acquire the resulting intellectual property from the entrepreneurs in the market for inventions, rather than incurring the higher costs of doing the job of producing themselves (Baumol 2005). As a result various business operations especially IT software and services have been outsourced to offshore which is another operational challenge for small business in domestic economy (Gamble 2003, Gupta and Chaudhari 2006).

### **3.2.2.3 Financial Challenges of Small Business**

Financial challenges of small firms are discussed widely among researchers and policies makers for the last several decades. However, financial challenges are regarded as one of the main

problems of small business growth. Currently, this problem is more important than ever since small firms are now forced to compete with their larger counterparts in international market as well as the domestic. Although, the large and small firms are operating in the same business environment the large firms are enjoying various advantages over small business as far as the financial support is concerned. Further, they have many channels of finance and they can spread its risks more widely, and are therefore advantaged with respect to both availability and costs of finance. On the other hand, unlike large firms, small firms are in general owned and operated by a single family or a small group of people. Small firms cannot raise capital in the organized securities market and hence their main source of capital market is banks and such financial institutions. Although this organizational form is an advantage for the decision-making, it is seen as a limitation for capital mobilization (Lund and Wright 1999, Stanley and Morse 1965).

The financial institutions and banks are using transactions lending technologies based on hard quantitative information, which includes financial ratios, credit scores and credit bureau reports to observe and verify the credit origination. Financial statement of the business, credit scoring, asset based lending, factoring and trade credit are some of the other important measures they use to take the lending decisions. Soft information, character and reliability of SMEs owners based on direct contact by the institutions loan officer, is another type of information that is used for considering their financial request. In general, this unique organizational structure of small business causes to have lower capitalization, limited capitalization, poor access to capital markets, limitation in cash flow, absence of dependable credit line and huge cash intensity in transition (Berger and Udell 2004). Due to these reasons financial institutions are not as generous to small firms as they are to large companies to finance for modernizing its plant and machineries. Investment bankers throughout the country have been slow to gear their facilities to the financial needs of small business (Pike 1941). On the other hand, large firms could overcome these hurdles without many difficulties.

#### **3.2.2.4 Marketing Challenges of Small Business**

Globalization is the situation in which all firms need to compete in domestic and international markets, which is a new challenge to small business that previously focused on domestic markets. The global market is riskier than the domestic one since global markets are likely to be quite varied and turbulent as they expand (Cronin-Gilmore 2009, Reynolds 1997). The international competitions of small firms are from their small business competitors and large level counterparts. The large firm's asset pattern, including intangible assets such as brand

preferences, is its key strength in this competition. Monopoly positions exist in ownership of a key resource or patent, but are now less significant than the acquisition and possession of a major market share that permits the large firms a significant degree of pricing initiative and hence favorable profits. Unlike small firms, large firms enjoy the superior marketing network advantage in international market (Stanley and Morse 1965). On the other hand, small businesses have various limitations to compete with these large firms. Lack of resources and information is one of the major limitations of the small firms to compete with large firms in international market. In general, companies initially develop in their domestic markets, and internationalization is a consequence of subsequent incremental decision (Armario et al. 2008). However, globalization does not provide such time lag for small firms, which is a crucial market challenge that small firms face.

### **3.3 Small Business in Developed Countries**

Industrial Revolution, the process of transition from hand and home production to machine and factory, of the nineteenth century was instrumental for the emergence of large factories first in the U.S., then in European countries. By 1870, goods were being made by power-driven machinery and assembled in factories in all advanced countries. In this process, small industry has been regarded as a passing phenomenon appearing at the early stages (King and Man 1974, Taymaz 2005). Along with the large firms, small firms of these countries played a significant role in the development of these countries. They contributed significantly to the economic development in terms of GDP, employment generation, inventions and innovations of several countries (Bell et al. 2004, Booyens 2011, Conte 2008, Headd 2005). This section examines small business performance in selected developed countries such as England, Canada and Germany in brief. Further, a separate section is given for American small business development since the current study is confined to the small firms in the United States.

#### **3.3.1 Small Business in England**

The industrialization, the turning point in industrial development around the world, which was initiated in England with the invention of the steam engine in the eighteenth century, is popularly known as the beginning of the industrial revolution. The industrial revolution was an instrument for structural changes of society that accompanied the movement from pre-industrial to industrial society (Barnes 1955). Production system in several countries has undergone transitions from homemade production to factory production, which led to reduce the importance of small



businesses. Despite greater growth of large firms several countries have given greater emphasis on small firms' growth. England is one of these countries that have given special attention to protect small business. The statistics published by the government reveals that small firms in England are still playing an important role in its economy. According to the English definition firms are considered to be small if their employees are less than 50 in numbers while a firm with up to 250 employees is regarded as a medium-sized business.

In England, the classification scheme for SME is a bit different from the official definition of SME in the European Union. As defined in EU law the main factors determining an SME are:

1. Number of employees (calculated as annual full-time equivalents) and
2. Either annual turnover (any rebates and value added tax excluded) or balance sheet total.

Table 3.1 Criterion for small and medium-sized business classification in EU

<b>Company category</b>	<b>Number of employees</b>	<b>Annual Turnover</b>	<b>or</b>	<b>Balance sheet total</b>
<b>Micro</b>	< 10	≤ € 2 m		≤ € 2 m
<b>Small</b>	< 50	≤ € 10 m		≤ € 10 m
<b>Medium-sized</b>	< 250	≤ € 50 m		≤ € 43 m

Source: EU recommendation 2003/361

As per government statistics, at start of 2013 there are 4,895,655 private sector businesses in UK, an increase of 102,000 from the previous year. These firms employed 24,332 thousand workers, and had an estimated annual turnover of £ 3,279,961 million. Small and medium-sized enterprises accounted for 99.9 per cent of all enterprises, 59.3 per cent private sector employment and 48.1 per cent private sector turnover. Nearly 76% of these small enterprises have no employees (3,684,740). Of the remaining 1.2 million employers, 81.5 per cent have between one and nine employees and are classified as micro businesses; 15.5 per cent have between 10 and 49 employees and are classified as small businesses; 2.5 per cent have between 50 and 249 employees and are classified as medium sized businesses; and 0.5 per cent have more than 250 employees and are classified as large businesses. This latter group also falls outside of the scope of this report as SMEs are defined as enterprises with fewer than 250 employees.

Table 3.2 Number of enterprises in the private sector and their associated employment and turnover by size of enterprises, UK in 2013

	<b>Enterprises</b>	<b>Employment thousands</b>	<b>Turnover £ millions</b>
<b>Small enterprises (0 - 49 employees)</b>	4,858,375 <i>99.2%</i>	11,426 <i>47.0%</i>	1,086,281 <i>33.1%</i>
<b>Medium-sized enterprises (50 - 249 employees)</b>	30,685 <i>0.6%</i>	2,998 <i>12.3%</i>	491,282 <i>15.0%</i>
<b>SUB-TOTAL SME (0 – 249 employees)</b>	<b>4,889,060</b> <i>99.9%</i>	<b>14,424</b> <i>59.3%</i>	<b>1,577,563</b> <i>48.1%</i>
<b>Large enterprises (250 or more employees)</b>	6,595 <i>0.1%</i>	9,907 <i>40.7%</i>	1,702,399 <i>51.9%</i>
<b>TOTAL All businesses</b>	<b>4,895,655</b> <i>100.0%</i>	<b>24,332</b> <i>100.0%</i>	<b>3,279,961</b> <i>100.0%</i>

Source: BIS 2013

Considering the importance of SMEs in economic development, government recently proposed several measures to help them. One of the proposals was to introduce a moratorium exempting micro and start-up businesses from new domestic regulation for three years from 1 April 2011 to minimize the regulatory burden and reduce the number of SMEs required to undertake audits and reduce financial reporting burdens for these firms. Another proposal was to provide 25 per cent of government contracts to SMEs. The Government is significantly reforming the Enterprise Investment Scheme (EIS) and Venture Capital Trusts (VCTs), subject to state aid approval; and the Government is increasing to £10 million the lifetime limit on capital gains qualifying for small and medium entrepreneurs' relief. It is proposed to improve the range of products and services available to support SMEs on issues relating to intellectual property, increase the rate of the SME research and development and tax relief to 200 per cent in 2011 and 225 per cent in 2012, subject to state aid approval to encourage innovation by SMEs (BIS 2010).

### 3.3.2 Small Business in Germany

There are around 3.6 million small and medium-sized enterprises as well as self-employed professionals in Germany, which play a significant role in German economy. In the past small and medium-sized enterprises were representing 99.3 per cent of all businesses subject to turnover tax, effect 44.8 per cent of all taxable sales, account for 57 per cent of total gross value added in industry, place 46 per cent of gross investments, create 69.3 per cent of jobs and offer 80 per cent of training places (Führmann and Juli 2002).

The detailed figures of SME in Germany are given in Table 3.3:

Table 3.3 Number of enterprises in German business economy with their number of employees and value added by size of enterprises, estimated for 2012

Company category	Number of enterprises		Number of employees		Value added	
	Number	Share	Number	Share	Billion €	Share
<b>Micro</b>	1,763,465	81.7%	4,859,923	18.5%	209	15.1%
<b>Small</b>	328,593	15.2%	6,140,520	23.4%	257	18.5%
<b>Medium-sized</b>	55,510	2.6%	5,348,282	20.4%	280	20.2%
<b>Sub-Total SME</b>	<b>2,147,569</b>	<b>99.5%</b>	<b>16,348,724</b>	<b>62.2%</b>	<b>745</b>	<b>53.8%</b>
<b>Large</b>	10,758	0.5%	9,915,234	37.8%	640	46.2%
<b>TOTAL</b>	<b>2,158,327</b>	<b>100.0%</b>	<b>26,263,958</b>	<b>100.0%</b>	<b>1,385</b>	<b>100.0%</b>

Source: European Commission, SBA Fact Sheet 2013 – Germany

More recent data show that German SME still are an important part of the German economy. In Germany, there are 2,158,327 industrial and commercial services companies in the so-called business economy (as explained on the previous page). 99.5 per cent of these companies are small and medium-sized enterprises according to the EU definition and employ 62 per cent of all people in this area representing 54 per cent of value added (estimation for 2012) in this area. On the other side, the 10,758 large companies in this area generate with 38 per cent of all employees 46 per cent of the value added.

Realizing importance of SMEs in Germany economy the Government provides various measures to promote small and medium enterprises since years. The government supports start-up entrepreneurs and SMEs with a set of financial instruments tailored to their needs. Start-up businesses and also existing SME get loans with little interest rates for long credit periods. These loans are provided through government owned finance institutions (KfW – Kreditanstalt für Wiederaufbau) or federal state finance institutions (e.g. LfA Förderbank Bayern and ILB Investitions bank des Landes Brandenburg). These funding programs were established for the special purpose of covering the capital needs of small and medium-sized enterprises, which gives borrowers' banks an up to 80 per cent release from liability (Schuman and Himmelreich 2011).

Table 3.4 Statistical profile of Small and Medium Business in Germany in 2009

No.	Category of business	SMALL AND MEDIUM SIZE COMPANIES				
		Number	Employment		Turnover 2011 in Mill. Euro	
1	Mining and quarrying	1,733	24,370	0.2%	4,354	0.2%
2	Manufacturing	202,859	3,268,258	20.4%	430,345	22.4%
3	Electricity, gas, steam and air conditioning supply	1,255	28,661	0.2%	18,333	1.0%
4	Water supply; sewerage, waste management and remediation activities	4,712	111,136	0.7%	26,527	1.4%
5	Construction	242,872	1,648,207	10.3%	161,614	8.4%
<b>Sub-Total</b>	<b>Industry</b>	<b>453,430</b>	<b>5,080,632</b>	<b>31.7%</b>	<b>641,173</b>	<b>33.3%</b>
6	Wholesale and retail trade; repair of motor vehicles and motorcycles	577,715	4,085,952	25.5%	743,608	38.6%
7	Transport and storage	88,807	1,024,964	6.4%	108,681	5.6%
8	Accommodation and food service activities	221,999	1,788,979	11.2%	58,384	3.0%
9	Information and communication	92,219	592,834	3.7%	72,719	3.8%
10	Real estate activities	196,634	420,588	2.6%	74,824	3.9%
11	Professional, scientific and technical activities	371,816	1,598,601	10.0%	149,050	7.7%
12	Administrative and support service activities	130,874	1,395,228	8.7%	73,819	3.8%
13	Repair of IT-equipment and consumer goods	9,974	33,458	0.2%	2,493	0.1%
<b>Sub-Total</b>	<b>Commercial Services (without insurances and pension fund)</b>	<b>1,690,038</b>	<b>10,940,604</b>	<b>68.3%</b>	<b>1,283,580</b>	<b>66.7%</b>
<b>TOTAL</b>	<b>INDUSTRY AND COMMERCIAL SERVICES</b>	<b>2,143,468</b>	<b>16,021,237</b>	<b>100.0%</b>	<b>1,924,753</b>	<b>100.0%</b>

Source: Statistisches Bundesamt Wiesbaden, Statistical Yearbook 2013, chapter 20

### 3.3.3 Small Business in Canada

Small business plays an important role in economic development of Canada by stimulating employment and fostering economic growth. The role of small business is identified as one of the reasons for economic growth during the period of economic sluggishness (Industry Canada, 2007). The contribution of the small business to the Gross Domestic Production in Canada varies between 25 and 29 per cent in the period from 2002 to 2011. In Canada the term ‘business’ refers to incorporated firms which have to meet two key criteria: at least one paid employee and annual turnover of \$ 30,000 or more. The self-employed entrepreneurs and the businesses in the sectors public administration (including schools and hospitals), public utilities and non-profit associations are excluded (Industry Canada 2013).

As of December 2012 the Canadian key small business statistics show 1,107,540 employer businesses with over 7.7 million paid employees or 70 per cent of the total private labour force. More than 98 per cent of Canadian businesses have less than 100 employees (small business), thereof the micro businesses (1 to 9 paid employees) are most important with 75 per cent of Canadian employer businesses. The medium-sized businesses (100 to 499 paid employees) with 1.6 per cent and the large businesses (500 or more paid employees) have a quite small share of less than 2 per cent of the Canadian employer businesses (Industry Canada 2013).

Distributions of Canadian SMEs

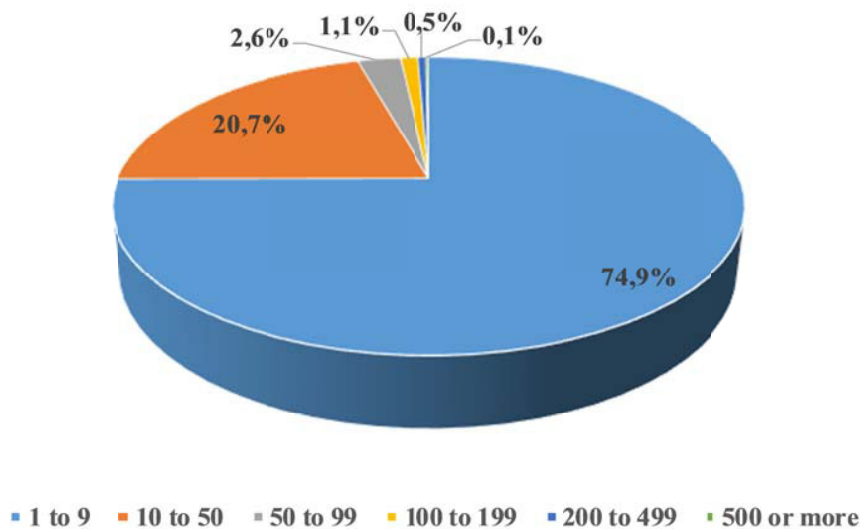


Figure 3.1 Distributions of Canadian SMEs by Size in 2012

Source: Industry Canada, Key Small Business Statistics – August 2013

Table 3.5 Number of Canadian employer businesses by sector and firm size in 2012

Number of employees	Number of employer businesses			
	Goods-producing sector	Service-producing sector	TOTAL NUMBER	Share
<b>1 – 4</b>	138.526	471.652	610.178	55,1%
<b>5 – 9</b>	45.958	173.813	219.771	19,8%
<b>10 – 19</b>	26.905	111.126	138.031	12,5%
<b>20 – 49</b>	18.491	72.535	91.026	8,2%
<b>50 - 99</b>	6.686	22.111	28.797	2,6%
<b>Small businesses (1 - 99)</b>	<b>236.566</b>	<b>851.237</b>	<b>1.087.803</b>	<b>98,2%</b>
<b>100 – 199</b>	3.322	9.297	12.619	1,1%
<b>200 – 499</b>	1.576	3.974	5.550	0,5%
<b>Medium-sized businesses (100 - 499)</b>	<b>4.898</b>	<b>13.271</b>	<b>18.169</b>	<b>1,6%</b>
<b>Large enterprises (500 or more)</b>	<b>437</b>	<b>1.131</b>	<b>1.568</b>	<b>0,1%</b>
<b>GRAND TOTAL</b>	<b>241.901</b>	<b>865.639</b>	<b>1.107.540</b>	<b>100,0%</b>

Source: Industry Canada, Key Small Business Statistics – August 2013

Table 3.5 presents the detailed information regarding sector wise distribution of these businesses. More than 78 per cent of the small businesses are in the service-producing sector, the corresponding share of the medium-sized and large businesses is nearly 73 per cent.

The sector-wise distribution of SMEs in Canada is given in figure 3.2.

### Distribution of Canadian SMEs

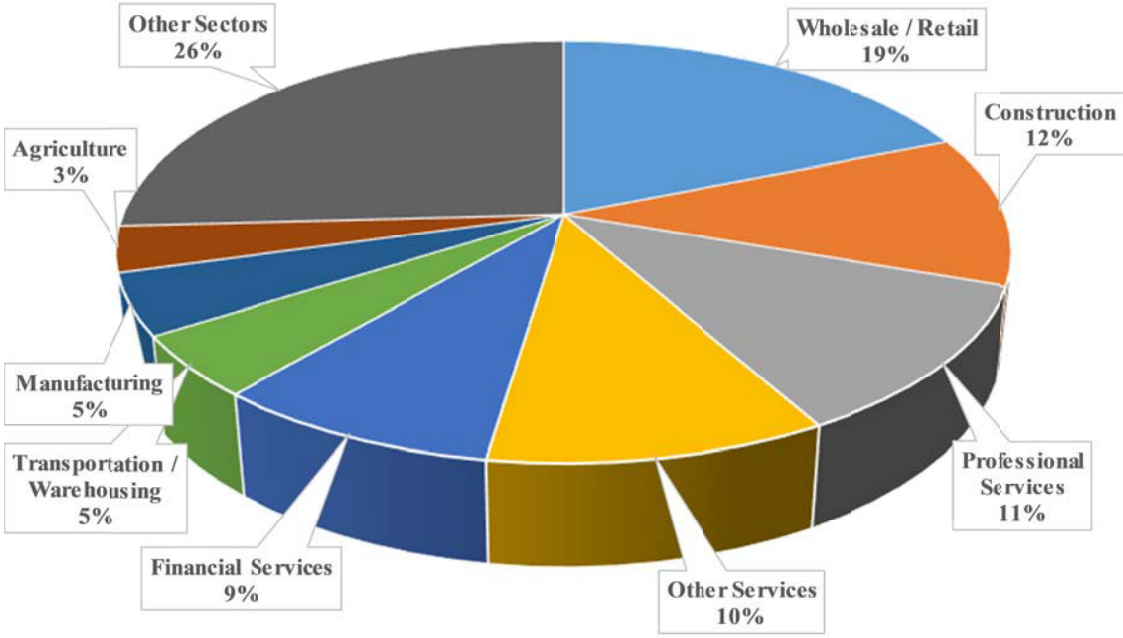


Figure 3.2 Distribution of Canadian SMEs by Sectors in 2012

Source: Industry Canada, Key Small Business Statistics – August 2013

More than half of the small businesses are represented by the four sectors wholesale trade / retail, construction, professional scientific & technical services and other services. Small businesses are playing a minor important role in the manufacturing sector which is one of the two dominant sectors of the medium-sized businesses. More detailed information is given in Table 3.6.



Table 3.6 Number and distribution of Canadian employer businesses by category of business and firm size in 2012

Category of business	Employer Businesses							
	Small		Medium		Large		TOTAL	
	Number	Share	Number	Share	Number	Share	Number	Share
<b>Construction</b>	126.842	11,7%	1.093	6,0%	86	5,5%	<b>128.021</b>	<b>11,6%</b>
<b>Manufacturing</b>	48.100	4,4%	3.228	17,8%	285	18,2%	<b>51.613</b>	<b>4,7%</b>
<b>Agriculture</b>	39.181	3,6%	143	0,8%	4	0,3%	<b>39.328</b>	<b>3,6%</b>
<b>Forestry, Fishing, Mining, Quarrying, Oil and Gas</b>	22.607	2,1%	451	2,5%	78	5,0%	<b>23.136</b>	<b>2,1%</b>
<b>Sub-Total Goods-producing Sector</b>	<b>236.730</b>	<b>21,8%</b>	<b>4.915</b>	<b>27,1%</b>	<b>453</b>	<b>28,9%</b>	<b>242.098</b>	<b>21,9%</b>
<b>Wholesale and Retail Trade</b>	204.270	18,8%	4.152	22,9%	67	4,3%	<b>208.489</b>	<b>18,8%</b>
<b>Accommodation and Food Services</b>	74.784	6,9%	1.263	7,0%	58	3,7%	<b>76.105</b>	<b>6,9%</b>
<b>Professional Scientific and Technical Services</b>	126.525	11,6%	1.015	5,6%	72	4,6%	<b>127.612</b>	<b>11,5%</b>
<b>Finance, Insurance, Real Estate and Leasing</b>	96.419	8,9%	1.026	5,6%	219	14,0%	<b>97.664</b>	<b>8,8%</b>
<b>Other Services</b>	115.130	10,6%	491	2,7%	34	2,2%	<b>115.655</b>	<b>10,4%</b>
<b>Health Care and Social Assistance</b>	88.531	8,1%	1.488	8,2%	59	3,8%	<b>90.078</b>	<b>8,1%</b>
<b>Management of Companies and Other Support Services</b>	62.467	5,7%	1.991	11,0%	356	22,7%	<b>64.814</b>	<b>5,9%</b>
<b>Information, Culture and Recreation</b>	31.400	2,9%	955	5,3%	138	8,8%	<b>32.493</b>	<b>2,9%</b>
<b>Transportation and Warehousing</b>	51.547	4,7%	873	4,8%	112	7,1%	<b>52.532</b>	<b>4,7%</b>
<b>Sub-Total Service-producing Sector</b>	<b>851.073</b>	<b>78,2%</b>	<b>13.254</b>	<b>72,9%</b>	<b>1.115</b>	<b>71,1%</b>	<b>865.442</b>	<b>78,1%</b>
<b>TOTAL</b>	<b>1.087.803</b>	<b>100,0%</b>	<b>18.169</b>	<b>100,0%</b>	<b>1.568</b>	<b>100,0%</b>	<b>1.107.540</b>	<b>100,0%</b>

Source: Industry Canada, Key Small Business Statistics – August 2013

As shown in Table 3.7 the largest number of employees paid by small companies are working in the sectors wholesale and retail trade, accommodation & food services, manufacturing and

construction; these 4,3 million employees have 56 per cent of all jobs in the Canadian small businesses.

Table 3.7 Number and distribution of Canadian employer businesses by category of business and firm size in 2012

Category of business	Number of Employees by Sector and Size of Business							
	Small		Medium		Large		TOTAL	
	Number	Share	Number	Share	Number	Share	Number	Share
<b>Construction</b>	723.098	9,3%	119.812	5,3%	41.390	3,7%	<b>884.300</b>	<b>8,0%</b>
<b>Manufacturing</b>	863.111	11,1%	577.041	25,7%	266.173	23,7%	<b>1.706.325</b>	<b>15,4%</b>
<b>Forestry, Fishing, Mining, Quarrying, Oil and Gas</b>	165.562	2,1%	81.477	3,6%	70.036	6,2%	<b>317.075</b>	<b>2,9%</b>
<b>Agriculture</b>	109.740	1,4%	10.341	0,5%	969	0,1%	<b>121.050</b>	<b>1,1%</b>
<b>Sub-Total Goods-producing Sector</b>	<b>1.861.511</b>	<b>24,0%</b>	<b>788.671</b>	<b>35,1%</b>	<b>378.568</b>	<b>33,8%</b>	<b>3.028.750</b>	<b>27,3%</b>
<b>Wholesale and Retail Trade</b>	1.843.039	23,8%	436.704	19,4%	75.474	6,7%	<b>2.355.217</b>	<b>21,2%</b>
<b>Accommodation and Food Services</b>	906.468	11,7%	86.264	3,8%	18.960	1,7%	<b>1.011.692</b>	<b>9,1%</b>
<b>Professional Scientific and Technical Services</b>	569.166	7,3%	202.132	9,0%	80.518	7,2%	<b>851.816</b>	<b>7,7%</b>
<b>Finance, Insurance, Real Estate and Leasing</b>	526.028	6,8%	159.357	7,1%	150.190	13,4%	<b>835.575</b>	<b>7,5%</b>
<b>Other Services</b>	505.242	6,5%	41.474	1,8%	10.776	1,0%	<b>557.492</b>	<b>5,0%</b>
<b>Health Care and Social Assistance</b>	483.900	6,2%	190.409	8,5%	199.282	17,8%	<b>873.591</b>	<b>7,9%</b>
<b>Management of Companies and Other Support Services</b>	386.532	5,0%	87.121	3,9%	35.489	3,2%	<b>509.142</b>	<b>4,6%</b>
<b>Information, Culture and Recreation</b>	340.612	4,4%	116.326	5,2%	90.787	8,1%	<b>547.725</b>	<b>4,9%</b>
<b>Transportation and Warehousing</b>	323.206	4,2%	139.324	6,2%	80.979	7,2%	<b>543.509</b>	<b>4,9%</b>
<b>Sub-Total Service-producing Sector</b>	<b>5.884.193</b>	<b>76,0%</b>	<b>1.459.111</b>	<b>64,9%</b>	<b>742.455</b>	<b>66,2%</b>	<b>8.085.759</b>	<b>72,7%</b>
<b>TOTAL</b>	<b>7.745.704</b>	<b>100,0%</b>	<b>2.247.780</b>	<b>100,0%</b>	<b>1.121.025</b>	<b>100,0%</b>	<b>11.114.508</b>	<b>100,0%</b>

Source: Industry Canada, Key Small Business Statistics – August 2013

Involvement of older entrepreneurs in SMEs is a special feature of Canadian Small business. It is argued that because of their involvement small businesses in Canada are not growing as fast as their U.S. counterpart. Proponents of this argument believe that many of these seniorpreneur-based businesses start small and would like to stay small.

In fact, almost 60 per cent of all small business owners in Canada consider themselves as 'lifestylers' that use their business as a means of generating income, while balancing other commitments or lifestyle choices (Tal 2006). Further, small business is critical as a focus for research because empirical data showed SMEs are more successful with radical innovations than large or mature firms. However, in half of the small businesses involved in innovation, plenty of opportunities exist for improving small business applied research and innovation (Grant 1998). Given the impressive employment gains by the small number of high-growth SMEs, considerable promise for improvement in SME applied research is apparent (James 2009).

### **3.4 The Small Business in America**

American business was small business in early stages of its development history. From the founding of the first colonies in the 1600s to the present day, small businesses have been integral to the economic, political and cultural development of the United States. In years before 1880, small business assumed myriad forms in America's merchandising, farming, manufacturing and service industries. Small businesses were important to Americans in non-economic as well as economic senses (Blackford 2003, Chandler 1977, Conte 2008, Gonzalez 2009). In the second half of the eighteenth century, as a consequence of the industrial revolution, railroad and telegraph systems have been introduced in the country. This was not only a new phase in the history of the industrialization of the country but also a new phase in the history of competition between large and small businesses. Despite strong competition from large firms, small firms depicted remarkable performance during this period (Conte 2008, Headd 2005). Still small business plays an important role in American economy and social life. On the economic side, small businesses employ half of the private sector work force, produce about half of private sector output, fill niche markets, innovate and contribute to the competition in free markets. On the human side, small businesses give individuals a chance to achieve their own versions of the American dream. It provides employment opportunities to individuals and demographic groups who might otherwise be shut out of the labor market (Headd 2005, Nguyen and Lee 2002, Robbins et al. 2000). Small businesses embody the American values of hard work, risk-taking, and independence (Clark, III and Moutray 2004). The Section 3.4.1 examines historical

evolution of small business and the Section 3.4.2 investigates role of government in growth of small businesses in America. While the Section 3.4.3 focuses on role of small business in economic development of America, the last section investigates about small business in telecommunication sector of the country.

### **3.4.1 Historical Evolution of Small Business**

Small businesses are related not only to the history of economic development or industrialization of the country but also the culture and growth of American people. Further, small businesses are considered as a fundamental part of the American people, society, and economy (Kaiser 2011, Lowrey 2005). Rapid economic growth characterized by the development of the American colonies created opportunities for the small business people who came to compose America's expanding commercial network. By 1914, one-third of America's industrial workers labored in firms with one to five hundred workers. Thousands of small firms handled the production and distribution of most goods and services (Blackford 2003).

## Former Small Business in U.S.A



Figure 3.3 An earlier Country Store in U.S.A.

*The Country Store, now so rare in some parts of the country that they are operated as tourist attractions; small country stores were a significant part of the nation's distribution system into the twentieth century. (Photo reproduced from Blackford 1991)*

Prior to the industrial revolution United States business was small business and small business operation extended from services sector to productive sector of the economy during this period. Precisely small firms made up America's business system since resource (technological, market and financial) limitations precluded the development of big businesses, except in a few fields, until middle of the nineteenth century (Audretsch 1995, 2002). Small country stores were a

significant part of the nation's distribution system into the twentieth century (Figure 3.3). Used car lots became a part of the American scene in the 1920s and 1930s, which provided an opportunity for independent entrepreneurs (Figure 3.4).

Former Used Car Business in U.S.A.



Figure 3.4 An earlier Used Car Business Lot in U.S.A.

*The Used Car Lot: A problem for owners, dealers, and companies, used cars provided an opportunity for independent entrepreneurs, and used car lots became a part of the American scene in the 1920s and 1930s. (Photo reproduced from Blackford 1991)*

The single owner-manager organizations were very popular in those days. They managed to carry out almost all activities from production to marketing including paper work for their organization. There was no question of division of labor and coordination problems were limited.

As a result they had less problems of managerial hierarchy regarding assignment of responsibility. Investment was also limited compared to the present day to big companies. A small business owner in Minnesota is shown at his desk in the 1930s. At one end of the scale, 'small' business can mean a single owner-manager (Figure 3.5).

Former small business office in U.S.A



Figure 3.5 An earlier small business office in U.S.A.

*Dealing with Paperwork: A small business owner in Minnesota is shown at his desk in the 1930s. At one end of the scale, 'small' business can mean a single owner-manager. (Photo reproduced from Blackford 1991)*

The second half of the nineteenth century was a period of transition from small businesses to big business in U.S. The first in this series was the establishment of railroad in 1850 and telegraph in

1860. Introduction of first railroads motivated big businesses to dominate those sectors of the economy in which they arose and were sustained. The introduction of railroad and telegraph caused to fall inland freight rates significantly which in turn created a new business atmosphere in the economy. The sharp decrease in shipping costs created a national market and that opened opportunity for firms to exploit economy of mass production which led to the start of several large industries: Standard Oil, Carnegie Steel, Singer, General Electric, Westinghouse, Swift, Armour, American Sugar, and American Tobacco (Blackford 1991, Douglass 1966, High 2011). The organizational structure and management of big businesses were different from that of small businesses. Unlike the small establishment, large firms had to find sources for capital investment. The bigger organizational structure necessitated vast network for hiring professional managers to organize their operations, however, even the largest manufacturing firms seldom had been capitalized at more than \$1 million, before the second half of the nineteenth century (Blackford 1991, High 2011).

The role of small business in American economy is not seen marginalized with the industrial revolution. They have contributed significantly in various inventions during this period with the involvement of large firms. Their role in various inventions are well recorded (Audretsch 1995, 2002). During this period small business adjusted to the presence of big businesses and hence growth of large business did not hurt small business growth. Moreover, they continued to increase in absolute numbers even in the manufacturing sectors during this period (Blackford 1991, High 2011). However, industrialization and subsequent technological innovations enhanced competitive ability of large firms and created challenges to small firms. Technological innovation enabled large firms to lower their variable cost by expanding their plant size and using scale economy, which created strong competitive challenges to small firms (Blackford 2003).

This competition between small firms and their large counterpart recalled the attentions of policy makers and academician. As a result of their discussion two lines of thoughts, traditional (static) and non-traditional (dynamic), emerged as far as impact of small firms on economic efficiency. The traditionalists oppose promotion of small business on the ground that it imposes excess costs on economy as a result of inefficient production techniques. This inefficient scale of production results in a lower level of productivity and lower wage rates to their workers. According to them, shift from large to small corporation reduces the living standard of the American people and discourages any move in favor of shifting from large to small firms (Audretsch 2001, 2002).

By contrast, the new theories are dynamic in nature and emphasize the role that knowledge plays. According to them, the major contribution of small firms to economic efficiency is



dynamic and evolutionary in nature. Small firms are working as an agent of change in growth of economy and society. New firms entering the industry do not simply increase the output as a miniature of the larger counterpart but they act as an agent for change (Audretsch 2001, 2002). According to them the small firms are more efficient than large firms because profit maximization is the main goal of the owner manager (Aiginger and Tichy 1991). Major share of jobs and technology innovations have come from small business (Blackford 2003). It is argued that they cultivate character and strengthen democracy and provide individuals the chance to achieve their own versions of the American Dream, dream of running one's own business. Small businesses, also, allowed entry into employment by individuals and demographics groups who might otherwise be shut out of the labor market. All these factors influenced to increase the number of small businesses since the 1880s (Conte 2008, Headd 2005). Considering these facts, the Federal Government introduced various Acts and Regulation to protect and promote small business.

### **3.4.2 Government Legislations in Promoting Small Business**

Government enacted various acts to encounter large firm's competition to small firm's right from the late decades of the nineteenth century. The 'Interstate Commerce Act to regulate railroads in 1887' was first in this series, which was enacted by the U.S. congress, partly to protect small business from a natural monopoly (Conte 2008). The enactment of America's first antitrust laws, the Sherman Act in 1890, was another move to protect small firms from the perceived 'unfair' encroachments of larger companies. These Acts were intended to prevent big companies from exercising excessive power in the marketplace. Within the period of twenty-four years, government enacted 'the Clayton Act of 1914', for protecting interest of the small business (Blackford 2003, Conte 2008).

In the 1920s and 1930s, large chain store operations created threat to the smaller grocery and drug store. The large chain stores extended their operations throughout the United States. Competing with smaller stores, the chains frequently benefited from economies of scale, which enabled them to sell at a price lower than those of their smaller counter parts. Responding to the threat of large chain store operations to small businesses, several states passed legislation heavily taxing chain stores, and Congress enacted the Robinson Patman Act of 1936 and the Miller-Tydings Act of 1937 to shield small retailers from the competition of large firms (Blackford 2003, Conte 2008). 'The Small Business Mobilization Act of 1942' was enacted when Congress recognized that business concerns operating small plants may not have the economies of scale necessary to compete with large plants.

Along with these Acts Government initiated several organizations to protect interest of small business. The small business corporation was the first organization that has been introduced by the government in this series. The 'Small War Plants Corporation' (SWPC), another one with the same goal, was formed by the congress in 1942 to help small business participate in war production. SWPC provided direct loans to private entrepreneurs, encouraged large financial institutions to make credit available to small enterprises, and advocated small business interests to federal procurement agencies and big businesses. This corporation was dissolved after the war, and its lending and contract powers were handed over to the Reconstruction Financial Corporation (RCF). During the Korean War Congress formed another wartime organization called Small Defense Plant Administration (SDPA) to handle small business concerns. The SDPA certified small business to the RCF when it had determined the business to be competent to perform the work of a Government contract. By 1952, the move was on to abolish RCF and steps were initiated to start another organization, the still existing governmental Small Business Administration (SBA), for protecting small business.

Congress created Small Business Administration (SBA) in 1953 with the goal of encouraging small business development. The main function of SBA was to 'aid, counsel, assist and protect, insofar as is possible, the interest of small business concerns'. The Regulatory Flexibility Act of 1980 and other measures, exempted small firms from many aspects of federal government regulation of business (Blackford 2003, Conte 2008). The Act of 1982 amended the Small Business Act of 1953, which established the Small Business Administration intending to stimulate technological innovation (Bears and Link 2010). In 2002, the federal government announced a strong small business agenda. In spite of all these favorable factors small firms are forced to face various challenges in domestic and international markets resulting from globalization. Consequently, small firms need to know their potential and challenges to survive in the current competitive market.

Small business incubator was another step that has been taken by the government to encourage small business. Its main intension was to promote small business that does not have enough resources to pursue their effort with the introduction of incubators. Incubators have been used to help develop blighted inner city neighborhoods, to foster scientific innovation, and to provide a proving ground to groups of entrepreneurs attempting to extend their expertise to other small business owners (Campbell and Allen 1987). Other goals are 'creating jobs in a community, enhancing a community's entrepreneurial climate, retaining businesses in a community, building or accelerating growth in a local industry, and diversifying local economies' ([www.nbia.org](http://www.nbia.org)). Typically a small business incubator begins with a facility offering a common location for new firms with below market rents to prospective firms. In addition to lower rents and co-location

with other, typically similar, new businesses, the incubator includes an array of support services designed to meet the needs of small start-up firms often owned by inexperienced or first-time entrepreneurs.

### 3.4.2.1 Growth Trajectory of Small Businesses in U.S.

The small firm in United States represents 99.7 per cent of all U.S. employer firms (Huang 2011, SBA 2009b). Table 3.8 gives a more precise picture in growth in total small firms along with employer and non-employer firms. The total number of small firms increased from 20,981,527 in 1997 to 29,276,800 in 2008, making an increase of average annual growth in 1.46 per cent in 1998 to 5.47 per cent in 2008. Employer firms increased during this period from 5,541,918 to 6,145,500, making an increase in average annual growth from 0.67 per cent to 1.58 per cent and the non-employer firms increased during the same period 15,439,609 to 231,313,100, making an average annual growth from 1.74 per cent to 6.56. Figure 3.6 shows overall growth trends of small firms.

The Growth Trend of U.S. Small Business

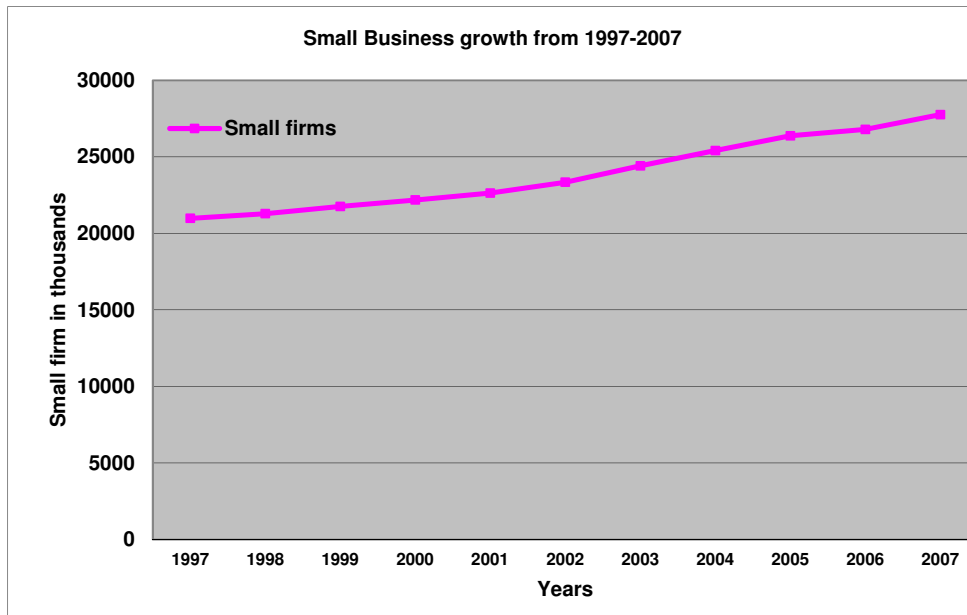


Figure 3.6 The overall growth trend of small business in U.S.

Table 3.8 Small business growth in U.S., 1997-2008

Year	Employer Firms		Non Employer Firms		Total Firms	
	Number	% Growth Rate	Number	% Growth Rate	Number	% Growth Rate
1997	5,541,918	-	15,439,609	-	20,981,527	-
1998	5,579,177	0.67	15,708,727	1.74	21,287,904	1.46
1999	5,607,743	0.51	16,152,604	2.83	21,760,347	2.22
2000	5,652,544	0.80	16,529,955	2.34	22,182,499	1.94
2001	5,657,774	0.09	16,979,498	2.72	22,637,272	2.05
2002	5,697,759	0.71	17,646,062	3.93	23,343,821	3.12
2003	5,767,127	1.22	18,649,114	5.68	24,416,241	4.59
2004	5,885,784	2.06	19,523,741	4.69	25,409,525	4.07
2005	5,983,546	1.66	20,392,068	4.45	26,375,614	3.80
2006	6,022,127	0.64	20,768,555	1.85	26,790,682	1.57
2007	6,049,655	0.46	21,708,021	4.52	27,757,676	3.61
2008	6,145,500	1.58	23,131,300	6.56	29,276,800	5.47

Source: Small Business Economy, 2009

### 3.4.3 Economic Performance of American Small Businesses

Small business make two indispensable contributions to the American economy; an integral part of the renewal process that pervades and defines market economies; an essential mechanism by which millions, including women, minorities and immigrants enter the economic and social mainstream of American society (Schumpeter 1950, 1942). Small businesses create most of the nation's new jobs, employ about half of the nation's private sector work force, and provide half of the nation's private real gross domestic product (GDP), as well as a significant share of innovations (SBA 2009). Still they continue to make a critical contribution to economic growth and innovative accomplishment (Baumol 2005). This section examines the role of small business

in contributing to the GDP, employment generation and inventions for accelerating economic development of the country.

### **3.4.3.1 Small Businesses Contribution to the GDP**

Small firms are seen to have contributed a remarkable share of U.S. GDP, major share of the exports from the U.S. and half of the private sector output (Headd 2005). The role of small business is important for future growth in per capita income (Craig, Jackson, III and Thomson 2007, Rajan and Luigi 1998, Reynolds and Miller 1988). It is argued that the States with higher proportions of very small businesses (20 employees or less) have more productive workforces, and higher levels of GDP growth than the States with lower levels of very small businesses (Reese 2008, Robbins et al. 2000). Further, it is argued that they helped to keep the dynamic nature of the economy (Audretsch 2002), maintain relatively stable GDP growth for the period 1970 to 1997, 52 per cent in 1970 and 50 per cent in 1997 (Joel Popkin and Company 2001). Figure 3.7 gives an outline of percentage share of small business in GDP.

## Contribution of Small Business to U.S. Economy

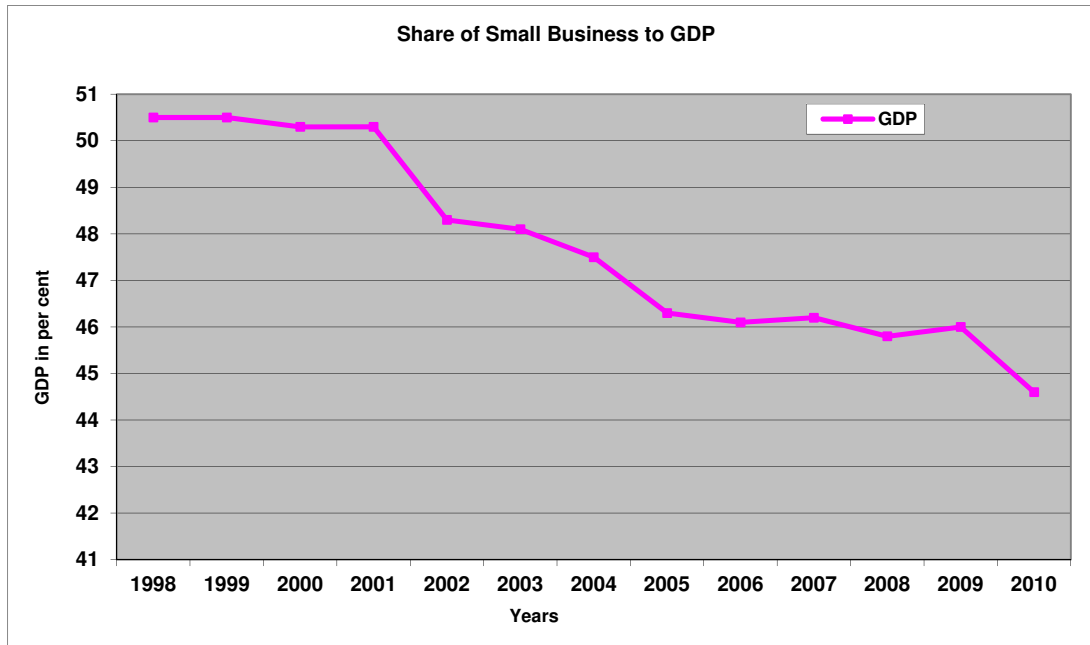


Figure 3.7 Share of Small Business in economy over the years

Source: SBA 2012

Sector wise details regarding contribution of small firms to GDP from various sectors of the economy are given in Table 3.9. The proportionate shares of various sectors are provided for further analysis. Of the sixteen industry sectors seven have small business shares greater than 50 per cent. Ordered from largest to smallest share in 2010 those are: other services (84.3 per cent), construction (83.5 per cent), real estate (75.4 per cent), arts and entertainment (68.8 per cent), professional and technical services (57.7 per cent), accommodation and food service (52.7 per cent), and health services (51 per cent). The other nine have small business shares of less than 50 per cent. Ordered from largest small business share to smallest those are: Administration and waste management services (44.4 per cent), trade combined (43.4 per cent), education services (39.7 per cent), transportation and warehousing (34.9 per cent), finance and insurance (33.7 per cent), holding companies (33.4 per cent), mining and manufacturing (28 per cent), information (18 per cent) and utilities (10.5 per cent). Distribution of small business GDP by industry in 2010 is given in Figure 3.8.

Table 3.9 Percentage share of small business to GDP from various sectors

<b>Industries</b>	<b>Year</b>						
	<b>1998</b>	<b>2001</b>	<b>2004</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
<b>Mining and Manufacturing</b>	30.8	32.4	29.7	28.8	30.7	28.6	28.0
<b>Utilities</b>	10.9	13.7	13.0	13.6	12.9	11.4	10.5
<b>Construction</b>	89.0	86.0	83.7	84.5	84.5	83.9	83.5
<b>Trade Combined</b>	53.2	51.2	46.6	45.3	44.3	43.3	43.4
<b>Transportation and Warehousing</b>	40.6	42.1	37.8	36.3	36.2	35.4	34.9
<b>Information</b>	24.3	17.7	13.6	13.7	13.8	12.5	11.7
<b>Finance and Insurance</b>	31.9	33.2	36.5	33.7	27.0	38.4	33.7
<b>Real Estate and Leasing</b>	76.5	77.1	72.6	75.7	76.2	75.2	75.4
<b>Professional and Tech. Services</b>	72.6	69.1	62.6	60.5	59.7	58.0	57.7
<b>Waste Management Services</b>	50.8	48.3	48.0	44.4	43.2	43.9	44.4
<b>Education Services</b>	43.2	43.1	42.2	41.1	40.4	39.3	39.7
<b>Health Services</b>	56.3	56.0	54.1	51.9	52.1	51.1	51.0
<b>Arts and Entertainment</b>	79.2	75.8	74.1	70.5	69.3	68.7	68.8
<b>Accommodation and Food Service</b>	60.8	58.5	53.7	52.6	51.6	52.6	52.7
<b>Other Services (excluding govt)</b>	87.4	85.7	85.7	84.4	83.6	84.1	84.3
<b>Holding Cos.</b>	29.6	26.9	33.6	29.0	32.6	33.3	33.4

Source: Kobe 2012, SBA 2012

## Distribution of GDP by Industry

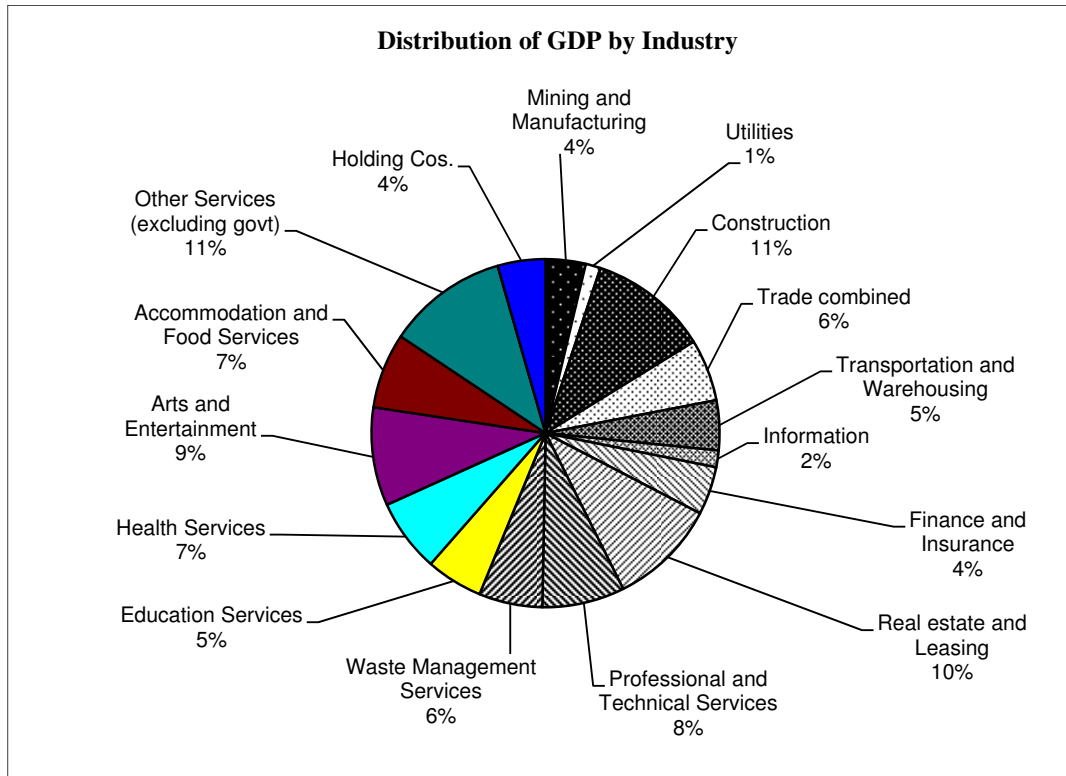


Figure 3.8 Distribution of Small Business GDP in 2011, Private non-farm sector

Source: Kobe 2012, SBA 2012

### 3.4.3.2 Small Businesses Contribution in Job Creation

Small businesses are known as the engines of economic vitality and job creation because they are committed to tapping in and leveraging the power and opportunities that private markets provide. They are important job generators because they tend to be more labor intensive than larger firms and as well as internal growth of small businesses, much job creation is the result of small business start-ups. The increase in total strength of small and medium-sized firms has expanded employment opportunities (Acs and Audretsch 1993, Acs et al. 2011, Buckley 1996). Small businesses often create the most jobs during economic recessions and play a significant role in the national recovery from recessions (Ezell 2012, Huang 2011, OECD 1985, 1985a). Small business generally focuses on local communities where large firms do not exist and their involvement in rural and local geographical areas creates new avenues for jobs in these regions



and attracts the younger generation to the business. Generally, small businesses are an important mechanism by which many young professionals enter the workforce (Huang 2011). Besides, newly generated employment opportunities in these small business sectors are more likely to be filled by the marginalized sectors such as older and women workers (Baldwin et al. 2004).

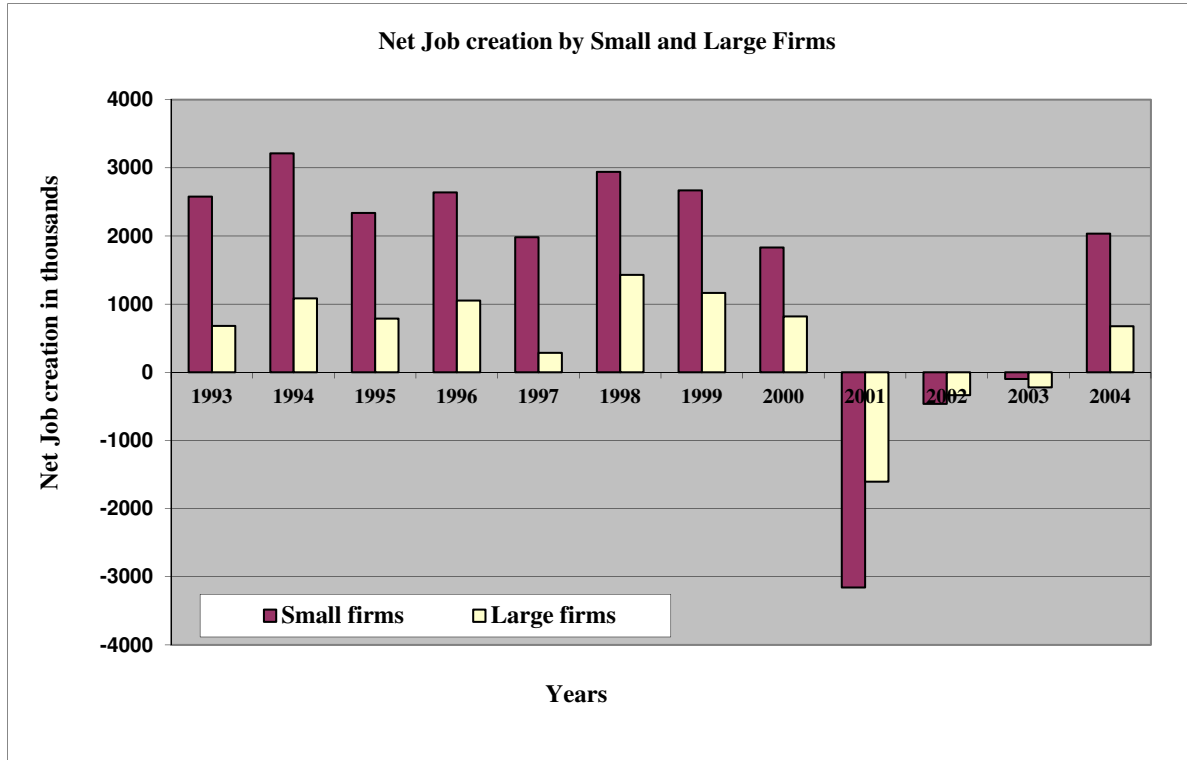


Figure 3.9 Net job creations of small and large firms

Source: SBA 2012

Small businesses accounted for two thirds of the net new jobs created between 1970 and 1990 (Dennis 1993). Small business employment share increased until the 1990's but remained stable afterward (Baldwin et al. 2004). Between 1987 and 1993 small firms created 5.8 million new jobs, while large firms experienced a net loss of 2.3 million jobs (Byrne 1993). In 2003 small firms accounted for ninety nine per cent of all firms and forty three per cent of all manufacturing jobs (SBA 2008). The net employment gain during 1990–95 was greater among smaller firms than among larger firms (Audretsch 2002). Small businesses play a vital role in employment generation, which in turn influence income generation and economic development. As a counterbalance to economic downturns, the contribution and economic reserve of smaller businesses produce the adaptability needed to buffer the economy. Thus small businesses

provide a safety net against unemployment by big businesses (Dennis 1993). Figure 3.9 is given to get the precise picture regarding net job creations by the small and large firms over the years.

Table 3.10 Job Gain and Loss of small and large firms in U.S. over the years

Years	Firms with less than 500 employees				Firms with more than 500 employees			
	Gain in '000	% Change	Loss in '000	% Change	Gain in '000	% Change	Loss in '000	% Change
1993	24,659		22,080		5,231		4,551	
1994	25,871	4.92	22,659	2.62	5,727	9.48	4,641	1.98
1995	26,161	1.12	23,823	5.14	5,802	1.31	5,013	8.02
1996	27,029	3.32	24,389	2.38	6,304	8.65	5,251	4.75
1997	26,913	-0.43	24,931	2.22	5,784	-8.25	5,498	4.70
1998	28,800	7.01	25,858	3.72	7,396	27.87	5,965	8.49
1999	29,475	2.34	26,805	3.66	7,432	0.49	6,267	5.06
2000	28,959	-1.75	27,127	1.20	7,040	-5.27	6,220	-0.75
2001	26,212	-9.49	29,369	8.26	6,127	-12.97	7,730	24.28
2002	25,697	-1.96	26,159	-10.93	6,009	-1.93	6,344	-17.93
2003	24,759	-3.65	24,857	-4.98	5,482	-8.77	5,703	-10.10
2004	25,937	4.76	23,902	-3.84	5,842	6.57	5,166	-9.42

Source: SBA 2012

It is clear from the table that the job creation of the large firms is far behind small firms over the years. Table 3.10 provides further empirical evidences regarding job creation from 1993 to 2004. In 1993, job gain in small business was 24,659 thousand whereas the loss was 22,080 which implies that the net amount was 2,579 thousand. In 2004, the job gain in small business was 25,937 thousand and 23,902 loss giving net job creation 2,035 thousand. However, in 1993 job creation in large business was 5,231 thousand and loss of 4,551 thousand resulting in net gain of 680 thousand jobs where as in 2004 large business sector showed 5,842 thousand job gains and 5,166 thousand job losses providing net job creation 676 thousand. While average annual growth

in job gain in small business from 1993 to 2004 showed a small decrease from 4.92 per cent to 4.76 per cent, large firm depicted average growth rate decreased from 9.48 to 6.57.

### **3.4.3.3 Small Businesses Contribution to Critical Inventions**

This section focuses on the role of small businesses played in crucial inventions in United States of America. Small businesses of U.S. often act as a source of innovation and entrepreneurs and contribute the critical share of the innovative breakthroughs in U.S. Their new ideas and creations drive an increased amount of revenue in the economy, and fill voids in products and services (Siegel, Wessner, Binks, and Lockett 2003). They create new ideas and processes through innovation, which adds vigor to the marketplace and are important to large businesses since most of the products made by big businesses are sold by small businesses (Griffin and Ebert 2006). The important innovations produced by the U.S. small firms in the 20<sup>th</sup> century include the airplane, fiber optic examining equipment, the heart valve, the optical scanner, the pacemaker, the personal computer, the soft contact lens and zipper (SBA 2009).

Table 3.11 Distribution of technology-wise patents from Small Business

<b>Technology Area</b>	<b>% of patents from small firms</b>	<b>% of firms that are small</b>
<b>Biotechnology</b>	25	71
<b>Pharmaceutical</b>	19	68
<b>Medical Equipment</b>	11	45
<b>Medical Electronics</b>	11	64
<b>Industrial Process Equipment</b>	5	28
<b>Electrical Appliances and Comp</b>	5	28
<b>Telecommunications</b>	5	33
<b>Semiconductors and Electronics</b>	5	44
<b>Measuring and Control Equipment</b>	4	26
<b>Plastics, Polymers and Rubber</b>	4	21
<b>Industrial Machinery and Tools</b>	3	20
<b>Computers and Peripherals</b>	3	30
<b>All technology Areas</b>	6	33

Source: SBA 2012

It is seen from a study conducted by CHI Research (2003) that the average patenting which is taken as the proxy of inventions from small firms more compared to their larger counter part. They have estimated that small firms with more than five employees produced 0.188 patents per employee and large firms 0.014 patents per employee. This study revealed that small firms share of U.S. patenting is 41 per cent. Further, small firm patents are on average more technically important than large firm patents. It is also seen that small patenting firms produce 13-14 times more patents per employee as large patenting firms. Further, small firm patenting is very strong in health technologies and gaming, and there are a large number of small firm innovators in parts of information technology. Their innovation is twice as closely linked to scientific research as large firm innovation on average, and so substantially more high-tech or leading edge and small firm innovation is more extensively linked to outside technology while large firms build more their own technology. It is also seen that small firm innovators are more dependent on local technology (SBA 2003). It is argued that small-business patents have higher public value than

large-business patents, but large-business patents have higher private value than small-business patents (Mogee 2003). Small businesses drive the economy and sustain the technological lead in the global marketplace resulting in one-third of all new patents issued (Cardin 2007).

Rapid innovation, in turn, leads to further globalization as firms seek greater economies of scale on which to apply their innovations (Acs et al. 1997). Through small businesses, new products are introduced, which is a freedom of innovation characteristic of many small businesses that yield countless advances in technologies, marketable goods, and services (Bovee et al. 2007).

### **3.4.4 Small Business Contribution to U.S. Telecommunication Industry**

Introduction of two large industries, railroads industry and telegraph system, laid the foundation for development of the United States which made tremendous progress in industrial production and communication. While railroad reduced barriers in transportation of inventories across the countries, telegraph industry reduced the distance among the people. Although these two sectors have undergone dramatic changes over the decades, the changes in communication sector are more visible (Fairchild 1977, Gandy, Jr. 2009, Harper 2000, Rai et al. 1996, Rutherford 2005, Teece 1986, Wessels 1996). The structure of the telecommunication industry has changed dramatically over recent decades as a result of technological changes. The telecommunication industry, which once consisted mainly of the telephone companies and their equipment vendors, has expanded greatly. It now includes a broad set of service providers, wireless carriers and equipment vendors; software-based applications; and companies selling components or intellectual property. Modern communication means telecommunication, which encompasses any communication over distance, through telephone, television, radio, wireless network, computer network, telemetry or other means but traditionally, the term referred to telephone services (Kazanjan 1988, Randolph et al. 1991). Traditional distinctions between sectors of this industry have become blurred through a process of convergence enabled by the production, storage, and transmission of more information and services in digital form resulting from the change in technology used for telecommunication (Lucky and Eisenberg 2006, Miller 2004, Travis 1991, Vaughan 2004).

The change in technology used in telecommunication affects every aspect of human life including simple voice telephone calls, access to the Internet, high speed data communications, satellite communication, surfing the World Wide Web, fax transmissions, video conferencing and cable television. As a result, both technology suppliers and service providers are increasingly in the business of providing telecommunication in all media simultaneously rather than

specializing in a particular type such as voice, video, or data (Ha and Thanh 2005, Lucky and Eisenberg 2006). Precisely, changes in communication systems created wide impact not only on society but also on the economy (Gandy, Jr. 2009). Large and small firms dominate in the telecommunication industry.

### **3.5 Conclusion**

This chapter examined the role of small businesses in industrialization and economic development of different countries. This investigation focused mainly on selected developed countries like England, Germany and Canada in general and the United States of America in particular. Although the role of small firms has been recognized as a passage for industrialization right from the period of industrial revolution the potential of small firms had been used for economic development of these countries and still they play a significant role in their economic development. More investigation has been carried out in this regard in the context of U.S. with the help of empirical evidences.

The investigation revealed that the potential of organizational flexibility, invention and innovation of small businesses are its strengths to compete with their larger counterparts. Small business invention potential enabled them to contribute to various inventions of the twentieth century such as the airplane, fiber optic examining equipment, the heart valve, the optical scanner, the pacemaker, the personal computer, the soft contact lens and zipper. Also small firms contribute significantly to the economic development of the country. Further, they contribute a major share of the GDP and create a large share of private employment. Their role in new innovation, technological inventions, early use of complex technologies, diffusion of new technologies, exploitation of international markets and managerial capability is very well recognized. Along with these potentials, small firms have various challenges from government policies, financial institutions and the global open market system.

## **Chapter 4**

### **Theoretical Foundation and Research Methodology**

#### **4.1 Introduction**

This chapter revolves around the discussion on theoretical foundation of the study and the research methodology. The discussion begins with background of the study in which attempt has been focused on small firm growth theory, competitive strategy, and business models. Significance of different business models that has been developed and tested in the context of large firms has been discussed. Subsequently, its role in the context of small firms is discussed in this section. Section three presents the process of developing research models for the current study. Separate models are developed for measuring impact of organizational and financial factors, value chain factors and market forces on firm performance. The fourth section describes the research methodology in which development of test instrument, target audience, survey design and sampling process, design and discussion of questionnaire, distribution of the test instrument and tool for data analysis are discussed. The fifth section discusses important concepts and its working definitions. The last section summarizes major observations.

#### **4.2 Theoretical Background**

As we have seen in the previous chapters small firms are the integral part of the economy and they play a vital role in the economy. Currently, small firms are not operating in an open economy and are forced to compete with all market forces. They have to compete with their small business competitors along with their counter parts in large business, which necessitates improving their competitive strategy. In order to improve the competitiveness, small firms must not only understand their problems but also need to know how to overcome market barriers. Although many factors are hypothesized to impact on the outcome of small business, there is no consistent pattern to the characteristics, which contribute to business competitiveness, success and growth (Audretsch et al. 2001, Gibb 1996, Street and Meister 2004, Van Gils 2000). Porter's value chain and competitive forces models, which has been used for measuring performance of large business, are used in this study as a framework for testing small firm performance. This

section is devoted mainly in discussing small firm theory and competitive strategy. The relevance of Porter's market forces and value chain models in the context of small business are also discussed in this section.

#### **4.2.1 Small Firm Growth Theory**

Several researchers have made their theoretical conclusions regarding small firm growth. It is argued that not all small firms are growth-oriented, and majorities are owner manager firm focused on day-to-day survival. Researchers like Storey (1994) categorized the major factors influencing small business growth into three groups such as starting resources (motivation, age, education, management experience, family history and training), the firm (age, sector, location, size, and ownership) and the strategy (training, market positioning, planning, and external equity) of the firm. However, these results are not tested empirically and show very little evidence to suggest that any particular trait leads to successful entrepreneurship (King and Man 1974, Smallbone and Wyr 2000, Walton 1987).

One approach regarding small firm growth theory is based on business management, where growth is taken as a function of the marketplace and focuses on the financial performance, as well as profitability and product (market) development (Penrose 1959). However, Jones (2000) states that organizational flexibility is the main factor that influences the growth of small business. According to him, the starting point for the SME must begin with the owner-manager establishing a broad strategic framework for the firm. According to Bone and Wyr (2000) small firm growth may be a function of employment generation. Sultan (2007) made almost the same observation. According to him some of the potential economic and social benefits of the small businesses are: creating jobs at low cost of capital; providing an opportunity to expand the entrepreneurial base; providing the required flexibility to adapt to market changes; providing support to large scale enterprises; and entering into market niches which are not profitable for larger enterprises.

Small family firms are a phenomenon in the small business sector, which are not likely to grow as fast as non-family firms. The SMEs, according to Jennings and Beaver (1997), must begin with the owner-manager establishing a broad strategic framework for the firm. In owner-manager firms, all the roles will either be performed by one person or by family members or friends, rather than on the basis of capability or education. The numerically dominant groups of small business are always likely to remain small-scale operations (Khanna and Rivkin 2001,



Storey 1994). Although medium family proprietors desired growth, their actual growth was lower than similar non-family firms. Management practices are less formal in family firms, and the gap between family and non-family firms in this area widened with growth (Jennings and Beaver 1997). Small family firms are less likely to pursue growth compared with similar non-family firms.

#### **4.2.2 Small Firm Competitive Strategy**

Competitiveness is the ability to achieve a targeted goal, which is essential for a firm to survive in the market. In other words, competitiveness is the means by which entrepreneurs can improve their firm's performance. The link between competitiveness and performance has long-term orientation rather than short-term. Hence, in order to improve competitiveness and performance, small firms need to understand their problems associated with competitiveness and methods to overcome it (Churchill and Lacobucci 2002, Khatri 1994, Man and Chan 2002, Nadim and Lussier 2010). The competitiveness is measured using subjective and objective measures. While the objective criteria includes return on investment, market share, profit and sales, subjective criteria includes enhanced reputation with customers, suppliers and competitors, and improved quality of delivered services (Audretsch 2001, Barney 2002, Gibb 1996, Narver and Slater 1990). The success of the firm depends on their capability to develop and implement competitive strategies to achieve so as to reach optimum level of subjective and objective goals. However, small firms have limitations to implement it in such ways that it is implemented in large industries.

The performance strongly depends on strategy choice of the firm (Roper 1999). Large corporations are gaining the competitive advantage over small and giant corporations ultimately dominating the entire economic landscape. The comparative advantage was generally attained through large-scale production, which facilitated low cost production through exploiting scale economies. This advantage would be due to scale economies in the production of new economic and technological knowledge. These scale economies would result from the organization of teams of highly trained specialists working on technological progress in a routinized fashion. The large corporation was thought to have both superior production efficiency and superior innovative efficacy (Audretsch and Thurik 1999, Schumpeter 1950). According to Schumpeter there is little room for small-scale experimental firms thriving on the uncertainty of technological advancement, whimsical markets and the individual energy of an obstinate entrepreneur. Only large industrial units were thought to be able to compete on global markets producing global

products. Precisely, large corporations are superior to small ones in nearly every aspect of economic behavior like productivity, technological advancement, compensation and job security. They enjoy convenience of mass production with the support of major societal institutions (Galbraith 1956).

Small firms' managerial structure is more flexible than the large firms, which is an advantage for them making changes in strategy and marketing without unnecessary time lag (Rothwell 1989). This flexible and independent managerial structure may be a more important measure of success for owner-managers of businesses than financial criteria such as growth in sales, profits and cash flow (Jennings and Beaver 1997). The theory of strategic niches suggests that small and large enterprises are not engaged in homogeneous activities. Rather, the activities of smaller firms can be distinguished from their larger counterparts as a result of strategic choices. Small firms will actually exhibit higher levels of profitability by occupying product niches in strategic groups that are inaccessible to their larger counterparts (Audretsch, Prince and Thurik 1998). Dynamic complementarity is an alternative suggested rather than competing small and large firms each other (Nooteboom 1994). In order to grow, small businesses must evolve their organization, incorporating changes to management structure, operational planning, control, and communication processes without compromising the firm's competitive advantage (Steinmetz 1969 and Sultan 2007).

Along with theoretical observations several researchers have developed models targeting small firm competitive strategy. Zairi (1996) presented a model to achieve competitiveness for small business through continuous process improvement, which is a two-staged model that provides push- and pull-forces. The first stage of his model identifies demand that includes: customer, global markets, shareholders, environment, technology and time; and the second stage of his model draws upon the firms' responsiveness to the above push factor, their strengths and core competences. In this model, the core competencies (teamwork, streamlined process, technology, measurement and a culture of continuous improvement) are the essence of the formulation of an organization's competitiveness.

The entrepreneurial competencies according to Man and Chan (2002) include the process dimension. It is argued that the entrepreneur should scan the external factors and focus on the firm's internal capabilities. Man and Chan stress the importance of links between competitiveness and performance as having a long term rather than a short-term orientation. The conceptual model they have developed to test SMEs competitiveness is presented in Figure 4.1.

# The SMEs' Competitiveness Model

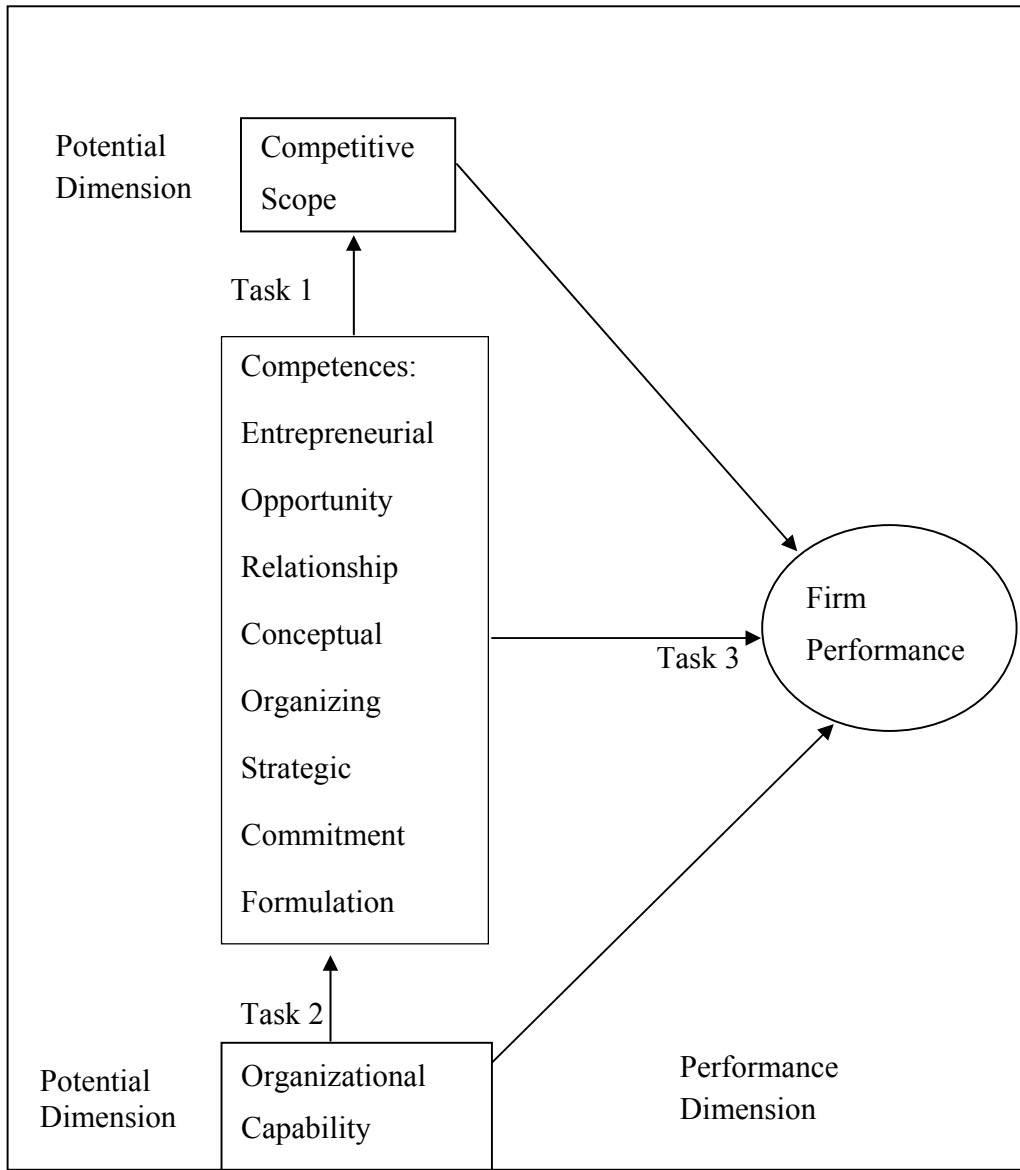


Figure 4.1 The framework for SMEs' Competitiveness Model

Source: Man and Chan 2002, Sultan 2007

Jones and Tilley (2003) developed a model for the competitive advantage in small firms, which is given below (Figure 4.2). It is argued that the SME must begin with the owner-manager to be effective. According to him organizational flexibility is the key source of competitive advantage for most

SMEs and their best measure of competitive advantage are value-added rather than profit, return on investment or market share.

### The Small Firm Competitive Advantage Model

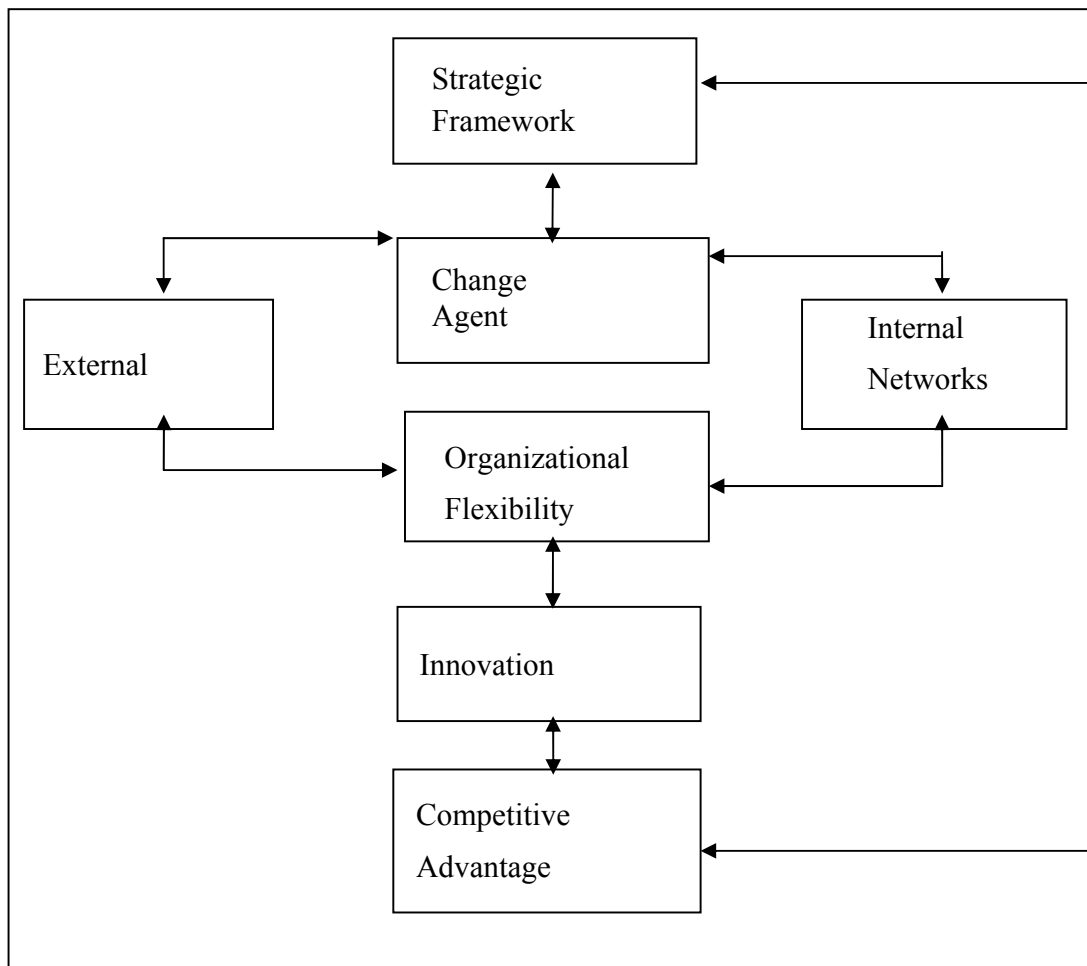


Figure 4.2 The framework for small firm competitiveness advantage model

Source: Jones and Tilley 2003

Porter (1980) has introduced three generic strategies to achieve competitive advantage in the market (Figure 4.3). The overall cost leadership; product differentiation and focus of target group are the three generic strategies. The cost leadership strategy requires aggressive decisions regarding efficient scale facilities. Large-scale production and subsequent cost reduction is required in this strategy. Second strategy, according to Porter, is to introduce differential unique product or services that are widely valued by the buyers. This differentiation can be introduced in different forms such as design or brand image, technology, featured dealer network or other dimensions. Differentiation leads to achieving high market share, which in turn can lead to gaining more revenue and profit. The final generic strategy focuses on a particular segment or group of a segment of the product line. While the previous two strategies are targeting the entire industry this one targets a segment of the market.

Generic Competitive Strategies

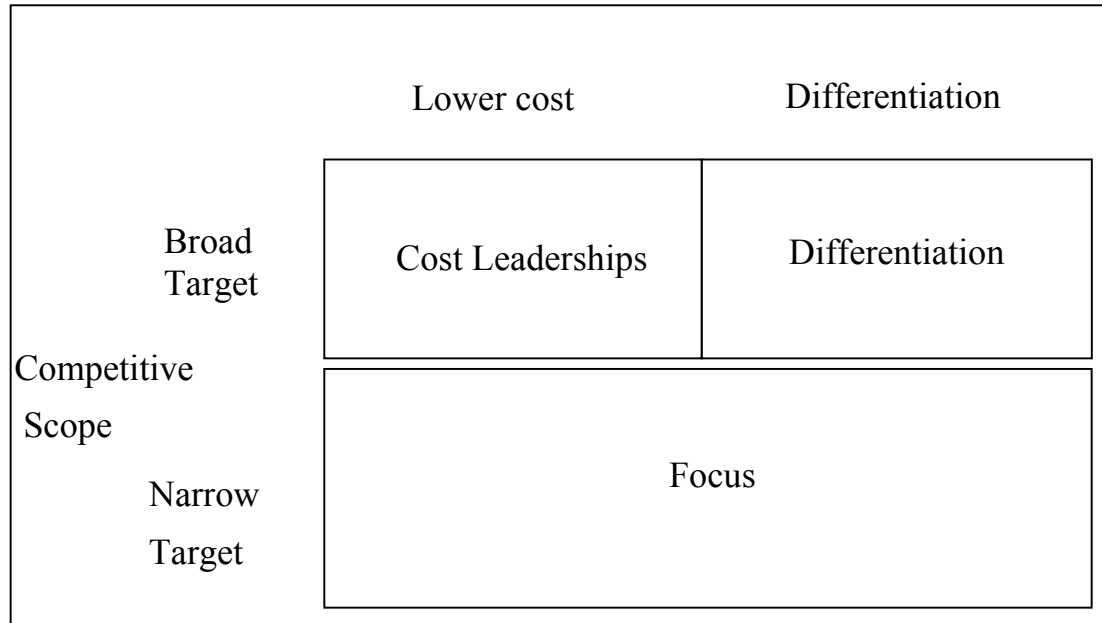


Figure 4.3 Three generic competitive strategies

Source: Michael Porter 1980

Large firms are the big players in the market and their ups and downs are taken as a problem for business development and economic growth. As a result, in general, business strategies developed targeting large firms' growth. Further, small firms are marginalized and their role in business and economic growth are not seen as well recognized.

### **4.2.3 Market Forces and Value Chain Factors**

The industrial structure has a strong influence in determining the competitive rules of the business as well as the strategies potentially available to the firm. Forces outside the industry are significant in market competition since outside forces usually affect all firms in the industry. Economists use the structure-conduct-performance paradigm to analyze the market performance because of the link between environment and strategies employed by the firm. The environment within which the firm operates or market structure, is then put into perspective in terms of the number of market players (buyers and sellers), barriers to entry, cost structure and product differentiation in relation to conduct that is illustrated in the pricing, product strategy, research and innovation (Kazem 2004, Porter 1980, 1985). While these market forces influence firm performances, value chain disaggregates firm into its strategically relevant activities in order to understand the behavior of costs and the existing and potential source of differentiation. The market forces and value chain models that have been developed by Porter are discussed in the following section.

#### **4.2.3.1 Michael Porter's Market Forces Model**

Porter is of the view that the state of competition in an industry depends on five basic forces, such as entry to the new competitors, threat of substitutes, bargaining power of buyers, bargaining power of suppliers and rivalry among the existing competitors. These market forces determine industries profitability because they influence the price, cost and the required investment of the firm in an industry. According to Porter the industry structure is relatively stable, but can change over time as an industry evolves, and the strength of the five competitive forces varies from one industry to another. The buyer's power influences the price that a firm can charge and influences cost and investment. The bargaining power of suppliers determines the costs of raw materials and other inputs. The intensity of rivalry influences prices as well as the costs of competing. The threat of entry places a limit on prices and shapes the investment required to deter entrants (Porter 1980). Due to these reasons the market forces model is still used for the analysis of industry and firm to measure the competitiveness (Chaffey 2002).

Managers use it to develop and implement long-term strategy for organizations so as to maintain competitive advantages in the long run. This model provides one simple approach to analyze industry structure, which can be used to compare the impact of competitive forces on their own organization with their impact on competitors. The state of competition in an industry depends on five competitive forces as shown in Figure 4.4.

Porter first developed a model connecting five forces, current competition, buyer power, seller power, new entry and substitute. Later on he added complementary product in this model. While the current competition gives the information about competition in the market, buyer power shows buyer bargaining power. In a perfect competitive market buyer need not have an advantage. However, monopsony, a situation in which only one buyer controls the entire market, has strong control over the market; price, quality etc. Supplier power is another factor that has some influence on product price and quality depending on number of suppliers. If it is a monopoly, a situation in which one supplier controls the entire market, he controls the market and price of the product. Substitute products influence the price of the product and market share. Profitable market attracts new entry, which leads to increased market size at the cost of current players and reduced price due to competition among the players in the market.

#### Market Forces Model

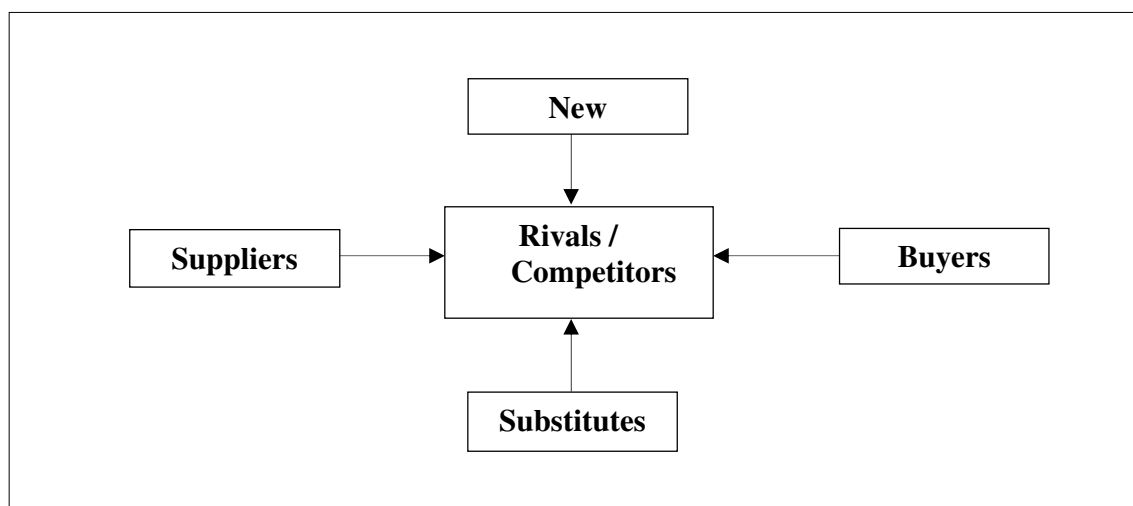


Figure 4.4 Michael Porter's competitive forces model

Source: Michael Porter 1980 Competitive Strategy, The Free Press, New York

#### **4.2.3.2 Michael Porter's Value Chain Model**

The value chain model draws the internal environment of a business unit, which indicates how the activities of the firm affect its competitor's efficiency and vice versa. The value chain describes the full range of activities, which are required to bring a product or service from conception, through the different phases of production, delivery to final consumer, and final disposal after use. Porter's value chain model is used widely in the business context, which is valuable for managers to develop and implement long-term strategy for organizations so as to maintain competitive advantages in the long run within the industry. The performed activities, when competing within a particular industry, can be divided broadly into primary activities and support activities. Primary activities are such as inbound logistics, operations, outbound logistics, sales and marketing, and services whereas support activities are those that provide purchased inputs, technology, human resources or the overall infrastructure functions supporting the other activities (Porter 1985). The importance of the value chain as a tool is that it shows the contribution from different functions of an organization in the value-adding process (Sultan 2007). A systematic way of examining all the activities a firm performs and how they interact is necessary for analyzing the sources of competitive advantage. The value chain disaggregates activities of the firm so as to understand the behavior of existing cost and the potential sources of differentiation. A firm gains competitive advantage by performing these strategically important activities better than its competitors (Porter 1985).



## Value Chain Model

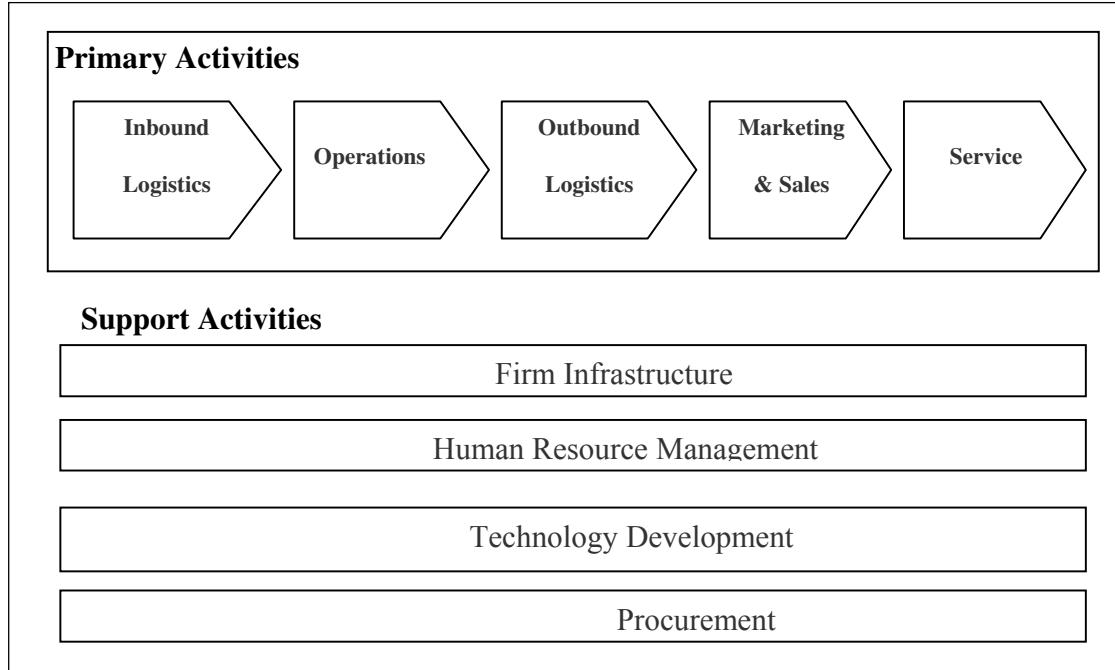


Figure 4.5 Porter's value chain model

Source: Michael Porter 1980 Competitive Strategy, The Free Press, New York

It is an effective tool to understand how each of internal business activities adds values to organizations by dividing a business into strategically relevant activities. Using the value chain to analyze costs to identify a firm's strengths and weaknesses is much more useful than traditional cost accounting protocol that most companies are still utilizing. The value chain also offers opportunities to reach better decisions. Competitive advantage may be obtained by optimizing and coordinating linked activities (Herger and Morris 1989). This helps to analyze the inner workings of competitor organizations in order to upgrade organizational performance. Every firm is a collection of activities that are performed to design, produce, market, deliver and support its product. Porter presented all these activities in a value chain, which is given in the Figure 4.5.

#### **4.2.4 Large Business Models and Small Business**

Although these two sets of business establishments are working in the same business environment, they have different capabilities to exploit market opportunities. The target of small as well as large firms is to achieve maximum success in the market. However, large firms are playing a very remarkable role in several sectors. Consequently, large firms received more attention than small firms. Further, several attempts have been made in analyzing various aspects of large firms and several models have been developed in its context. Porter developed value chain and competitive forces business model for large firms and tested empirically its significance in the context of large business.

One of the main criticisms against Porter's model is that it was developed on the economic situation in the eighties characterized by strong competition and relatively stable market structures. Now markets are highly influenced by technological progress, especially in technology and information technology. Technological innovations and dynamic market entrants from start-ups will completely change business models within a short time. Five forces model provides a good framework for analysis but does not really consider issues around implementing changes to reposition for strategic advantage. Another criticism is that this model overemphasizes the importance of industry structure as a determinant of company performance and underemphasizes the importance of differences between companies within an industry (Babbie 1990, Hill and Jones 1995).

Since survival, growth and profitability are some of the main goals of all industries; they are interested in evaluating future profit potential in the market. Large firms are capable of using different methods to achieve this goal. Porter's model is one of the tools that they use to evaluate and assess the market situation and business performance. However, no serious attempt has been made to evaluate the relevance of this model in small firms. This study is an attempt in this direction.

### **4.3 Development of Research Models**

The process of developing an analytical tool, regression model, to test the impact of various factors on firm performance is discussed in the outset of this section. Regression models, as usual, are developed connecting independent and dependent variables. However, selection of independent and dependent variables are important. A set of individual regression models has been developed using different performance indicators such as Market Share (MS), Return on Investment (ROI), Revenue per Employee (RPE), Value Added (VA), and Return on Management (ROM) as dependent variables. It is obvious from the literature review that the individual performance measures need not convey the real performance of the firm always. In order to overcome this limitation Composite Performance Index (CPI), which is developed using the weighted average of the five performance indicators, along with the individual measures are used to measure firm performance. Organizational and financial factors, value chain factors and market forces are three independent variables with several components. Operational flexibility, structural flexibility, strategic flexibility and financial flexibility are used as the proxies of organizational and financial factors. Inbound logistics, operations, outbound logistics, sales and marketing, services, infrastructure, human resources, technology development and procurement are proxies of value chain. Further, supplier power, buyer power, current competitors, new entry, substitute products and complementary products are proxies of market force. Separate models have been developed and are given below.

Model 1:

$$Y_{Ai} = f(\text{OF}, \text{SF}, \text{STF}, \text{FF})$$

The first set of models connect the firm performance with organizational and financial factors which is mathematically written as:  $Y_{Ai} = f(\text{OF}, \text{SF}, \text{STF}, \text{FF})$

Where  $Y_{Ai}$ 's ( $i = 1, 2, 3, 4, 5$  and  $6$ ) are performance measures which are composite performance indices; Market Share, Return on Investment, Revenue per Employee, Value Added and Return on Management and  $X$ 's are independent variables as follows (Figure 4.6).

OF: Operational Flexibility

SF: Structural Flexibility

STF: Strategic Flexibility

FF: Financial Flexibility

Conceptual framework for measuring influence of organizational and financial factors on firm performance

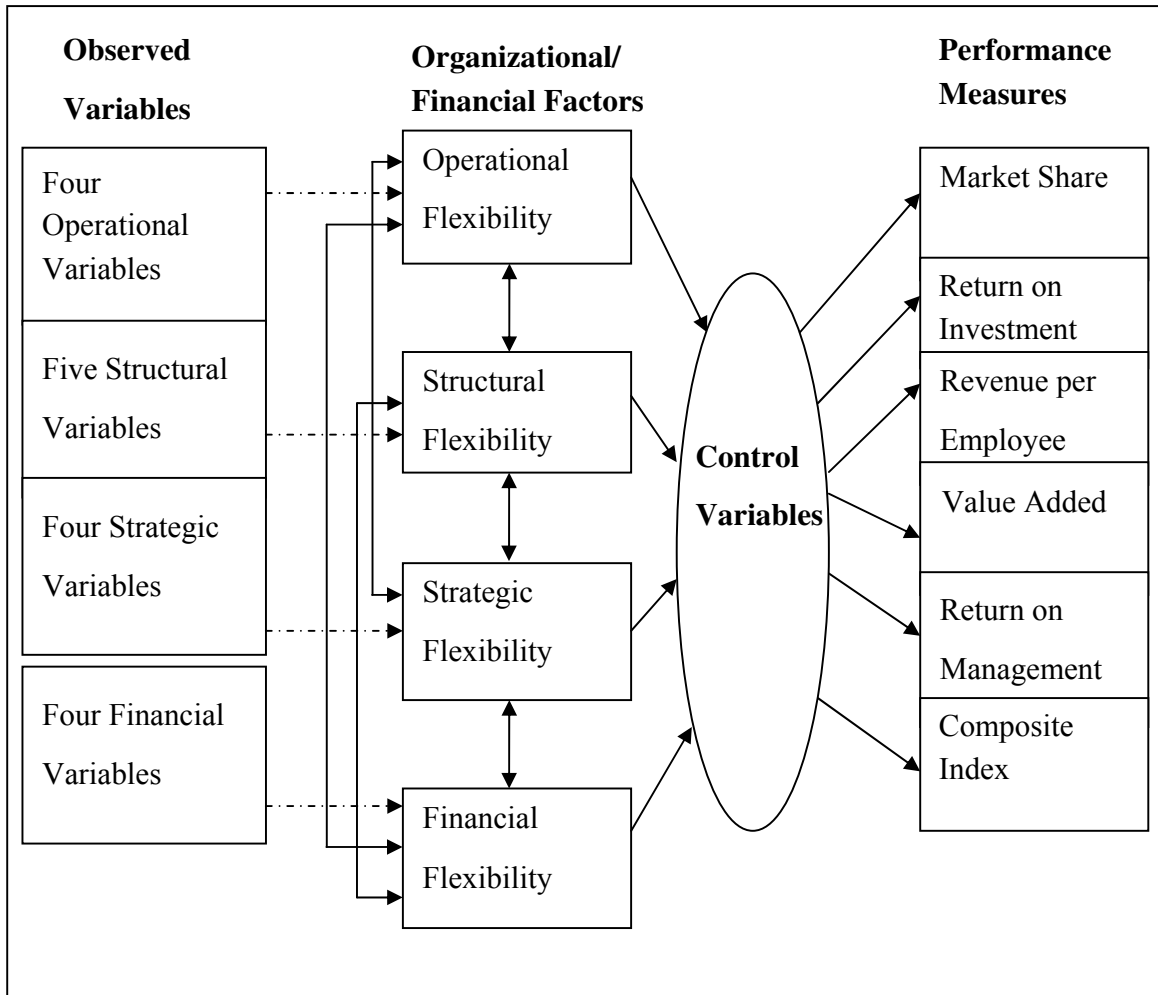


Figure 4.6: Model for measuring influence of organizational and financial factors on performance

Model 2:

$YBi = f(IL, OP, OL, SM, SR, IFR, HR, TD, PR)$  where  $YBi$ 's ( $i = 1, 2, 3, 4, 5$  and  $6$ ) are performance measures which are composite performance indices; Market Share, Return on Investment, Revenue per Employee, Value Added and Return on Management and IL, OP, OL, MS, SR, IFR, HR, TD, PR are independent value chain variables as follows (Figure 4.7).

IL: Inbound Logistics

MS: Market Share

OP: Operation Resources

OL: Outbound Logistics

SM: Sales and Marketing

SR: Services

IFR: Infrastructure

HR: Human Resources

TD: Technological Development

PR: Procurement

Conceptual framework for measuring influence of value chain factors on firm performance

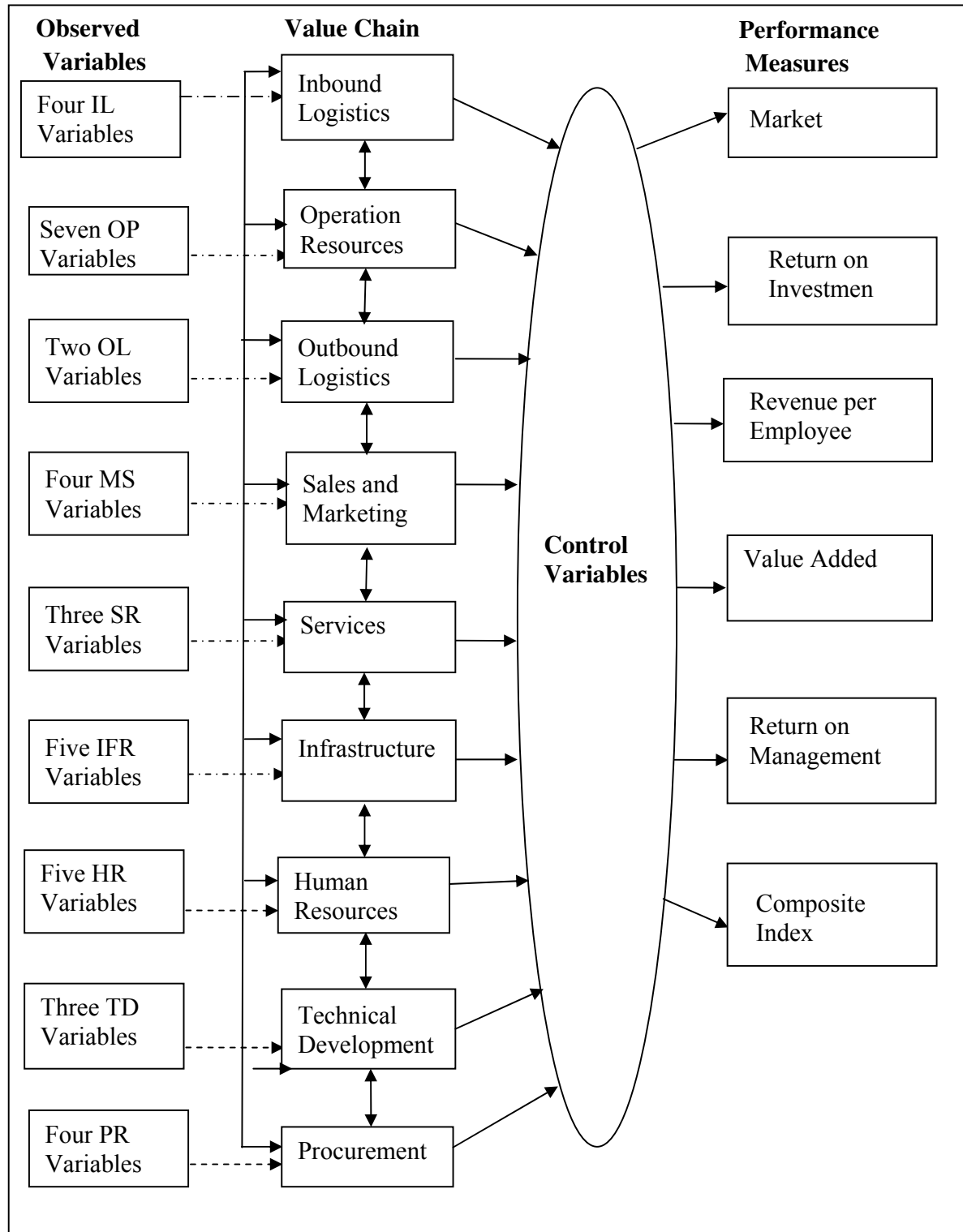


Figure 4.7 Model for measuring influence of value chain factors on performance

Model 3:  $Y_{Ci} = f(SP, BP, CC, NE, SBP, CP)$

YCi's (1, 2, 3, 4, 5 and 6) are performance measures, which are Market Share, Return on Investment, Revenue per Employee, Value Added, Return on Management and Composite Index. The independent market force variables SP, BP, CC, NE, SBP, CP are as follows (Figure 4.8).

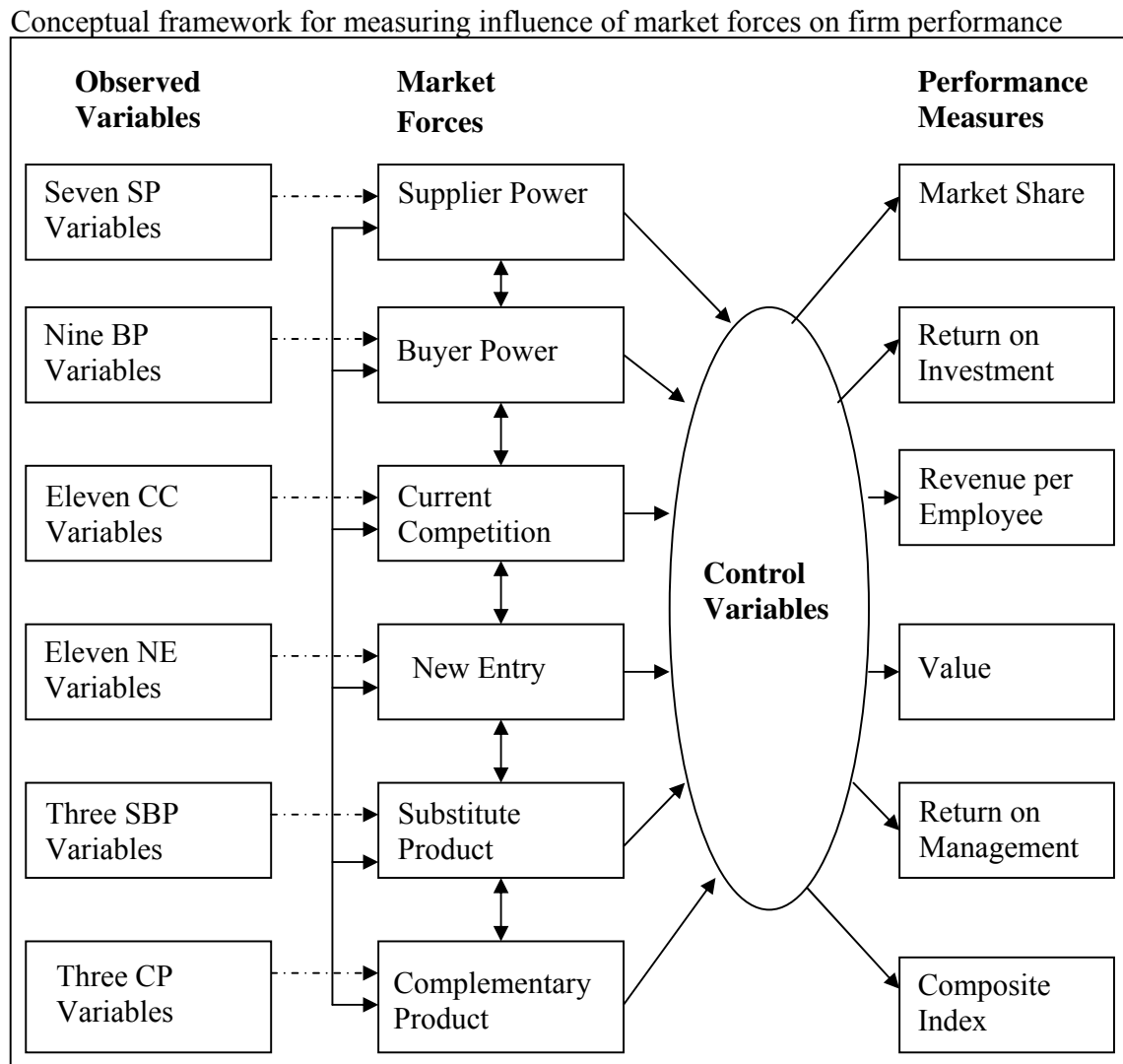


Figure 4.8 Model for measuring influence of Market forces on performance



- SP: Supplier Power
- BP: Buyer Power
- CC: Current Competition
- NE: New Entry
- SBP: Substitute Product
- CP: Complementary Product

### 4.3.1 Development of Composite Index

Researchers use different indicators to measure firm performance since there is no hard and fast rule that shows which indicator represents firm performance. Some researchers are seen to have used more than one variable to overcome limitations of the single performance indicator. In this study, we have developed a scientific method to measure performance developing a composite index along with the individual performance indicators. Composite index is developed by assigning proportionate weight to all individual performance indicators using five points Likert scale. Based on the discussion with respondents relative weight for each individual performance indicator is fixed from 5 to 1 in the following order; market share, value added, revenue on employees, return on investment, and return on management respectively. Composite index is defined as:

$$\begin{aligned}
 CI &= \sum Wi*Xi \\
 &= W1*MS+W2*VA+W3*ROE+W4*ROI+W5*ROM,
 \end{aligned}$$

where  $W_i$ 's are weights assigned each category based Likert scale and  $X_i$ 's are values of MS, VA, ROE, ROI, ROM

## 4.4 Research Methodology

This section focuses on the research methodology. While Section 4.4.1 deals with development of the test instruments; target audience, survey design, description of questionnaire and distribution the Section 4.4.2 presents the process of collecting and processing of data.

## **4.4.1 Development of the Test Instrument**

A test instrument was developed to gather data regarding performance of the firm from selected units, which are the primary resources for performance analysis using Porter's value chain and competitive forces model. Process of the development of the test instrument is given in the following section.

### **4.4.1.1 Target Audience**

The respondents for this survey are those who have immediate knowledge of, or access to, the information requested. The personnel with management functions; CEO, President, Vice-president, General Manager and others involved with the business activities within their organization and capable of providing required information, are selected. The target audience consists of a small fraction of the executives of the selected units who are directly controlling these firms.

### **4.4.1.2 Survey Design and Sampling Process**

The empirical investigation regarding small firm performance using entire units in the population is a difficult task due to time and resource constraints. Further, investigation of private enterprises is not easy since owners are not interested in sharing internal information with a third party due to the competitive reason. Small firms are large in numbers and every year large number of firms appears and disappears. Considering, all these facts, as a scientifically proven procedure, a multistage sampling procedure is used for the selection of units for detailed empirical analysis of the study (Saunders et al. 2000, Schaeffer and Presser 2003, Shurry et al. 2002).

The purposive sampling procedure is used for the selection of an industry in the first stage. Presence of the market forces, such as buyer power, current competition, supplier power, is the first condition for selection of the industry. Application of the advanced technology on different levels is used as another criterion for industry selection. The telecommunication components industry is selected since technology is current in industry and market forces are visible. In the second stage a random sampling process is used to select individual units from the industry. All the 3,732 units in the industry are numbered in serial order so as to make selection easier. Ten

per cent of the total of the 3,732, one out of ten firms, are selected from the list. There are 373 (10 percentage) units selected from the total population. Detailed distribution of the units based on industrial code is given in Table 4.1.

Table 4.1 Distribution of telecommunication components firms based on industrial code and number of employees

<b>SIC</b>	<b>Less 10</b>	<b>10-24</b>	<b>25-49</b>	<b>50-99</b>	<b>100-249</b>	<b>250-499</b>	<b>Total</b>	<b>Number Selected</b>
<b>3671</b>	12	20	15	8	15	13	83	<b>8</b>
<b>3672</b>	22	56	61	58	44	16	257	<b>26</b>
<b>3674</b>	139	194	157	138	156	77	861	<b>86</b>
<b>3675</b>	13	33	26	19	31	11	133	<b>13</b>
<b>3676</b>	15	26	20	25	33	14	133	<b>13</b>
<b>3677</b>	26	51	35	34	33	10	189	<b>19</b>
<b>3678</b>	63	120	125	91	110	49	558	<b>56</b>
<b>3679</b>	221	361	290	254	280	112	1,518	<b>152</b>
<b>Total</b>	<b>511</b>	<b>861</b>	<b>729</b>	<b>627</b>	<b>702</b>	<b>302</b>	<b>3,732</b>	<b>373</b>

#### 4.4.1.3 Design and Description of the Questionnaire

The next task was to develop the survey questions so as to get the maximum information from the respondents. Identifying information, the name of the university conducting the research and details of the student, is prominently displayed on the questionnaire to convey authenticity of the study. Detailed information regarding the purpose of the study is given in the front page of the survey schedule. The general format and structure of the survey was developed in such a way that the informants could answer the questions without much difficulty. The total number of survey questions was limited so as to encourage members of the target audience, the senior executives of the firms with limited spare time, to respond positively to the survey. Multiple-choice questions, using Likert five point scales, are given to avoid any confusion. All questions are framed as maximum point (5) when respondent fully agrees with the question and minimum point when fully disagrees with that question (Dillman 1991, Johnson and Scholes 1998, Neuman 2003). Detailed instructions regarding each question are provided separately.

The questions are organized into five different sections. Questions in Section A is designed to obtain respondent's title and function along with details regarding the size of the firm, number of employees, annual revenue and capital investment. While the questions in Section B are framed to collect information regarding organizational and financial factors Section C is developed to collect information regarding value chain factors. Questions in Section D are designed to collect information of market forces. The numbered questions in B, C and D are used control variables in empirical analysis. These variables are estimated from different indirect observable questions closely related to each question so as to avoid individual question bias. Section E is used to get level of performance of the firm. Respondents are asked to estimate level of performance according to the ranges, as opposed to providing the exact figures of the unit on one or more performance indicators. It was expected that respondents would be more amenable to providing an estimate than taking the time to look up or calculate the requested information. Finally, an opportunity was provided to give free comments on the survey. The last question gave them the opportunity to describe their views without any pressure. A brief definition of each measure was provided to help respondents provide requested information without much difficulty. An explanation of each question is given below.

Section A consists of five questions with intent to collect primary information relating to the respondents and firms. Questions 1 and 2, the respondent's title and function, permit characterization of that respondent as being within the target audience. The last option of these questions (others) gives them liberty to provide their own choices. Questions 3, 4 and 5 are instrumental to gather the information regarding size of the unit, annual revenue and capital investment respectively.

Section B consists of four questions to collect information to test operational flexibility, structural flexibility, strategic flexibility and financial flexibility of the firm. This information is collected through a set of indirect questions since private companies are unwilling to share inside business information to outsiders including researchers due to business reasons. Five points Likert scale is used in this question hence maximum possible value of each question is 5 and minimum is 1. Total points from all the direct question is used for further analysis.

The first question of Section B is used to obtain information to measure the influence of operational flexibility on firm performance, which has four direct questions (items). These questions are developed on the assumption that operational flexibility allows the firm to dispose excess production capacity, outsourcing operation, use temporary personnel and select different

supplies. The maximum value (5) of the question 'dispose an excess production capacity' indicates its strong influence of on operational flexibility and the minimum values indicates weak influence.

The second item is developed on the assumption that operational flexibility enables the firm to outsource more activities. Conversely, the maximum value (5) of the question outsourcing indicates firm has flexibility to outsource its operation. The same argument is used for the following questions too. The third item in this question 'use of temporary personnel' is used to measure operational flexibility of the firm to use temporary personal. The maximum value (5) indicates firm has the flexibility to use temporary personnel. The fourth question 'selection of different suppliers' is used to measure firm's operational flexibility in selecting different suppliers. The maximum value indicates that firm has flexibility to select different suppliers to increase the performance. The maximum possible value (20) of these four direct questions indicates strong operational flexibility and minimum value (4) indicates weak operational flexibility.

The second question is used to obtain information to measure structural flexibility of the firm performance, which includes five items. The items in this question are framed on the assumption that structural flexibility enables the firm 'work force enlargement', 'alteration of control system', 'creation of multifunctional team', 'conjoint manufacturing' and 'conjoint design'. The maximum value (5) for work force enlargement indicates that firm enjoys high level of structural flexibility and minimum value (1) indicates low-level structural flexibility. The maximum value alteration control system indicates strong structural flexibility. Similarly, the high values of creation of multifunctional team, 'conjoint manufacturing' and 'conjoint design' are indications of high degree of structural flexibility of the firm. On the other hand minimum values indicate that firm has least structural flexibility.

The third question of section B is used to obtain information regarding strategic flexibility. There are four direct questions in this question, which are developed on the assumption that structural flexibility enables the firm to make appropriate decision on 'fast strategic change', 'variety of strategic change' based on the requirements, 'control of the competitors' adopting appropriate strategy and 'control over commercial regulations' introducing appropriate for managing administrators. The maximum values for these items indicate that the firm has high degree of strategic flexibility and the degree of flexibility varies depending on the score points.

The fourth question of Section B is used to obtain information to financial flexibility of the firm. There are four direct questions in this question, which are developed on the assumption that the financial flexibility enables the firms to: 'use of uncommitted resources', make 'short payback of the capital invested', 'use of short-term contract' and to have the 'ability to access to financial resources'. The maximum points for each of these items are the indication of the financial flexibility of the firm. The total points from these direct questions are used for further analysis in examining influence of financial flexibility on performance.

Section C has been framed to obtain information on primary and supporting value chain activities of the firm, which has nine numbered questions. These questions are classified for collecting primary activity and secondary activities of small business following Porter's pattern for large firms. While the question on primary activity is inbound logistics, operation, outbound logistics, sales and marketing, and services, the questions on supporting activity are infrastructure, human resources, technology development and procurement. These questions are used as control variables in further empirical analysis. As in the previous cases, several closely associated direct questions are included in each numbered question. Detail of the items included in each question is given below.

The first question is used to obtain information regarding inbound logistics of the firm, which is used to measure influence of inbound logistics on firm performance. Direct questions ('receiving inventory', 'receiving inspection', 'inventory', and 'inventory distribution') are selected on the assumption that each of these items is closely related to inbound logistics. The maximum value (5) for receiving inventory indicates strong relationship of inbound logistics and receiving inventory where minimum value (1) indicates its weak relationship, while the maximum possible value of these items (20) indicates strong relationship of these items with inbound logistics and minimum possible value (4) indicates its weak relationship with inbound logistics. The second question, operation, is associated with activities of R&D, engineering, manufacturing processing, workflow, documentation and quality control. The maximum value for these items indicates its correlation with operation whereas minimum value indicates its weak correlation with operation.

The third question is used to obtain information regarding outbound logistics of the firm. Direct questions are selected on the assumption that the activities associated with finished goods inventory and packaging and shipping are closely related to outbound logistics. The maximum value for finished goods inventory indicates strong relationship of outbound logistics and finished goods inventory where minimum value indicates its weak relationship. The maximum value of these direct questions indicates strong relationship of these items with outbound logistics. The fourth question, sales and marketing, is used to obtain information regarding

activities related with providing a means by which buyers can purchase the product. Generally, advertising promotions and channel selections are closely associated with sales and marketing items. Considering nature of the telecommunication components business direct questions for this question are selected as ‘contact with customer management’, ‘work presentation’, ‘proposal preparation’ and ‘point of sales’. The maximum value of these questions indicates strong relationship between sales and marketing with these questions. The fifth question is used to obtain information regarding services, which has three direct questions such as ‘customer support’, ‘technical support’, and ‘repair services’. The maximum value of these items indicates strong relationship between services and the items in this question.

Questions six to nine of Section C are used to obtain information regarding supporting activities of the firms. The sixth question, infrastructure, consists of five direct questions such as general management, finance/accounting/payroll, data management, communications, and manufacturing resource planning system. Maximum value of these questions indicates strong correlation of infrastructure with these items and minimum indicates weak correlation. The question seven is used to obtain information regarding human resources management, which consists of five direct questions associated with activities involving hiring, training, compensation, benefits and evaluation. The maximum possible value of this question (25) indicates strong correlation of human resource management with these items of the question and minimum value (5) indicates least correlation. The question eight is used to obtain information regarding technological development of the firm that can be used to improve products and processes. Direct questions relating to three activities are R&D, evaluation, and dissemination. The maximum possible value indicates strong correlation of technology development with these items. The question nine, procurement, refers to the function of purchasing inputs used in the firm’s value chain not to the purchased inputs alone. The activities of procurement involve ‘purchasing’, ‘production evaluation’, ‘subcontracting management’ and ‘outsourcing management’. The maximum value of these questions indicates that procurement has close correlation to these variables and minimum value indicates least correlation.

Section D has been framed to obtain information regarding market forces such as supplier power, buyer power, current competitors, new entry, substitute products and complementary products. An indirect approach is used to obtain information regarding market forces from new entry, substitute products and complementary products by asking methods to defend new entry, presence of substitute products and complementary products. Several direct questions are used to get information regarding each of these market forces. Details of these questions are given below.

First question in this section is used to obtain information regarding supplier power in the market. Seven direct questions are selected to gather information regarding supplier power on the assumption the supplier power is closely associated with domination of few suppliers in the market, product differentiation, lack of close substitute, significance of volume of purchase, supply of intermediary product, threat of forward integration and built in switching cost. The maximum value for the question 'few suppliers dominate in this market' indicates as one of the reasons for strong supplier power and the minimum value indicates weak supplier power. The second item (question) examines supplier power resulting from highly differentiated product from a supplier. The maximum value for the differentiated product is an indication of strong supplier power and vice versa. The third question examines supplier power resulting from lack of close substitute product. Fourth item indicates power supplier when the supplier provides a significant share of total supply. The fifth question examines supplier power when the product is an important input for the buyer. The sixth item examines supplier's threat of forward integration. The higher value indicates higher degree of forward integration from the supplier. The last question examines influence of switching cost on supplier power. Higher value indicates high switching cost is advantage for supplier. The maximum possible value of this question (35) indicates strong supplier power, and minimum value (7) indicates weak supplier power.

The second question in this section is used to obtain information regarding buyer power which has nine direct questions such as few buyers in the market, undifferentiated product, close substitute product in the market, purchase with significant share of the total sales volume, buyer's low switching cost, buyer's low profit margin, buyers threat of backward integration, informed buyer, unimportant product to buyer. The maximum value for the question 'few buyers dominate in the market' indicates as one of the reasons for strong buyer power and the minimum value for weak buyer power. Maximum value of undifferentiated product indicates that undifferentiated is an advantage for the buyer. While the maximum possible value of these questions indicates higher buyer power the minimum value indicates weak buyer power.

The third numbered question is used to obtain details of current competition, which has eleven direct questions such as initiate a new business line, product differentiation, just-in-time delivery, delivery lead time, capital mobilization ability, price differentiation, cost leadership, service quality, ability to exploit niche market, ability to take risk to introduce new product, and workers commitment are used to get level of competition in the market. These negatively phrased questions indicate firm's ability to defend current competitors, which implies presence of current competition in the market. The maximum possible points from these questions indicate strong current competition in the current market, and minimum points indicate weak competition. The fourth numbered question is used to obtain information regarding competition



from new entry. Eleven direct questions influential to defend new entry of firms are used for this purpose. As in the previous case these questions are also negatively phrased and argument is almost similar. Ability of the firm to defend new entry in the market indicates that there was some degree of competition from new entry. The maximum values for these questions are taken as an indication of strong competition from new entry and minimum value as an indication of weak competition from new entry. The fifth numbered question is used to obtain degree of competition from substitute product. Three direct questions are used to measure firm's ability to defend substitute products. Answers to these negatively phrased questions indicate firm's ability to defend competition from substitute product, which implies presence of competition from substitute product. The maximum value indicates strong competition from substitute product and minimum value indicates weak competition from new entry. Sixth numbered question is used to measure competition from complementary product. Three negatively phrased direct questions are used in this purpose. Answers to these questions indicate that firm's ability to defend competition from complementary product, which implies there was certain degree of competition from complementary products.

Section E encompasses five questions targeting to measure performance of the selected sample units using Market Share (MS), Return on Investment (ROI), Revenue per Employee (RPE), Value Added (VA) and Return on Management (ROM). The respondent is asked to estimate the relative performance of their firms. Further, additional space is provided for comments, if any.

#### **4.4.1.4 Distribution of the Test Instruments**

A hard copy of the questionnaire has been used for collecting information from sample units. The copies of the questionnaire were mailed to 373 company executives, along with a stamped return envelope to send back the completed forms. The response rate was not encouraging; the rate of response was around ten per cent. Another set of reminders was mailed once again to remind them to complete the survey. Next stage, an attempt has been made to seek support from the local trade magazine editors to motivate small business owners to respond positively to the survey. Finally, we received 50 usable responses resulting from multi-level efforts to convince firm executives about the importance of the study.

## **4.4.2 Tools for Data Analysis**

Different statistical tools and software have been used for statistical analysis of the study. The data collected from the field survey first transferred into Excel spreadsheet as to manage it for further analysis. Further analysis has been carried out with the help of SPSS software. Reliability and consistency of the data was tested with the help of Cronbach's alpha, one of the popularly used statistical tools (Bates 1989, Berg 1989, Black 1999). The multiple regression analysis is another statistical tool that has been used to analyze the relationship between the set of independent variables and dependent performance indicators. Relevance of the consistency reliability test and performance analysis is given in the following section. The result of the analysis is given in Chapter 5.

### **4.4.2.1 Consistency and Reliability Test**

Several steps were taken to ensure accuracy, consistency and dependability of the study. Consistency and reliability of data were tested to ensure accuracy, consistency, and dependability of the data prior to initiating detailed analysis (Backstrom and Hursh-Cesar 1981). Cronbach's alpha, a commonly used tool, tests the stability of individual measurement items across replications from the same source of information. It determines the internal consistency or average correlation of items in the survey instrument to gauge its reliability. For internal consistency and construct validity, Cronbach's alpha should have a value of at least 0.70 (Nunally 1978). Items total correlation coefficients of each variable with the control variables were further examined. Any variable having item correlation coefficient less than 0.30 would be disregarded to enter in the model for performance analysis. Detailed discussion on empirical analysis is given in Chapter 5.

### **4.4.2.2 Performance Analysis**

Multiple regression analysis is a flexible and adaptable multivariate technique that can be used to examine the relationship between a single dependent variable and a set of independent variables (Hair et al. 1998). Although this is often done in practice, it is not a statistically valid technique, since Likert scale questions do not possess a normal probability distribution. Hence, reliability of the test instrument has been tested before proceeding with testing the hypotheses using regression.

The multiple regression equation takes the form  $Y = a_0 + a_1*x_1 + a_2*x_2 + \dots + e$ , where Y is the dependent variable, 'a's are the regression coefficients for the corresponding x (independent) variables,  $a_0$  is the constant or intercept, and e is the error term reflected in the residuals. The standardized version of the b coefficients is the beta weights and the ratio of the beta coefficients is the ratio of the relative predictive power of the independent variables. Associated with multiple regressions is  $R^2$ , multiple correlations, which is the per cent of variance in the dependent variable, explained collectively by all of the independent variables.

The dependent and independent variables selected for this study were introduced in Chapter 3. Table 5.4 presents the variables and associated coding from the survey instrument. The dependent variables consist of measures of performance as developed from review of the literature and feedback from respondents. The composite index and individual performance indicators, Market Share (MS), Return on Investment (ROI), Revenue per Employee (RPE), Value Added (VA) and Return on Management (ROM) are dependent variables in regression analysis.

## **4.5 Concepts and Definitions**

This section describes various concepts and definitions used in the thesis. Some of the concepts and definitions are general in use. However, some definitions and concepts have different meanings and interpretations in different places and different context. For example there is no general norm for definition of small business. Different criteria such as number of workers employed or capital investment are used in different countries to define small business. A specified working definition is provided in this section to overcome such conflict.

### **4.5.1 Small Business Definition**

Different researchers, authors and government agencies in one country itself use different criteria to define small firms. While dealing with international situations, the problem will be more difficult. Broadly speaking, there are two broad approaches to define Small and Medium-Sized Enterprises (SMEs); the first approach is to differentiate small from large on the basis of some quantitative measures; and the second approach attempts to define small industry in terms of functional criteria. According to Peterson et al. (1986) both quantitative and qualitative measures are used in defining the small business. These definitions vary according to the geographic area and purpose of the study. Quantitative measures are the most popular tools to define the SMEs

such as the number of employees and the annual turnover. In the European Union, the firms with less than 250 employees are considered SME. However, in the United States the firms with less than 500 employees are regarded as small business (OECD 2000c). Structure of the business such as the number of employees (Kohn 1997, Vinten 1999), financial performance (Calof 1993); firms age (Feindt, Jeffcoate and Chappell 2002), comparisons with other similar organizations in its field or industry (Alvarez and Barney 2002; Gartner 1985, Street and Cameron 2007) are also used to define small firms.

The United States Small Business Administration (SBA 2009a) defines a small business as one, which is independently owned and operated, is not dominant in its field of operation, and employs fewer than 500 employees. Although the SBA places a 500-person cap on the number of employees in their definition of a small business, an alternative criterion may be more appropriate. According to Headd and Kirchhoff (2009), in U.S. median employer firm size is four, and the average firm size is 23 employees respectively. Many government agencies and researchers define a small organization as one having fewer than 100 employees (Evatt et al. 2005). Adapting definitions in the literature and taking the U.S. Census Bureau's data into consideration, this dissertation defines a small business as one which is not dominant in its field of operation and which has fewer than 100 employees. This number of employees is large enough to encompass the U.S. SBA's definition as well as the average firm size based on the Census Bureau's statistics (Huang 2011).

#### **4.5.2 Working Definition of Small Business**

Considering ambiguity of definition of small firms, we have adopted a commonly used definition from the U.S. Small Business Administration. The working definition of a small business in this study is a firm with less than 500 employees.

#### **4.5.3 Competitive Advantage**

Competitive advantage is 'The set of unique features of a company and its products that are perceived by the target market as significant and superior to the competition' (Lamb, Hair and McDaniel 2008:19).

#### **4.5.4 Competitor Analysis**

Competitor analysis is ‘the process of identifying key competitors; assessing their objectives, strategies, strengths and weaknesses, and reaction patterns; and selecting which competitors to attack or avoid’ (Kotler and Armstrong 2006).

#### **4.5.5 Operation Performance**

The term operation performance is generally used to express the results of activities of an organization (firm or business) over a given period of time, which is mainly depending on organizational flexibility, value chain efficiency and competitive advantage on market forces.

#### **4.5.6 Performance**

Performance depicts effectiveness of firm operation, which can be measured using different indicators depending on the requirement. Market Share (MS), Return on Investment (ROI), Revenue per Employee (RPE), Value Added (VA) and Return on Management (ROM) are the indicators used in this study to measure firm performance.

#### **4.5.7 Market Share (MS)**

Market share is the contribution of the firm to the total sales (TS) in the market. Market share of the  $i^{\text{th}}$  firm can be written as

$$MS_i = TS_i / \sum TS_i$$

#### **4.5.8 Return on Investment (ROI)**

Return on investment is used to measure the efficiency of an investment; the benefit (return) of an investment is divided by the cost of the investment, which is written as:

$$ROI = \frac{\text{Total benefit from Investment} - \text{Cost of Investment}}{\text{Cost of Investment}}$$

#### **4.5.9 Revenue per Employee (RPE)**

Revenue per employee measures the average revenue generated by each employee of a company, which is an important ratio that looks at a company's sales of a period in relation to the average number of employees in the same period. In general, relatively high revenue per employee is a positive sign that suggests the company is finding ways to squeeze more sales (revenue) out of each of its workers. It is calculated using the formula:

$$\text{RPE} = \frac{\text{Total Revenue}}{\text{Number of Employees}}$$

#### **4.5.10 Value Added (VA)**

Value added is used to describe addition of value to a commodity at each stage of its manufacture. The value added at each stage of processing will be equal to the value of the product. In other words value added is the increase in the value of goods and services as a result of the production process, which indicates performance of an industry, firm or an economy. Sales less cost of material input is used as the best representation of value added which can be written as:

$$\text{VA} = \text{Value of Production} - \text{Value of Intermediate Goods}$$

#### **4.5.11 Return on Management (ROM)**

Revenue less costs divided by revenue. It can be written as:

$$\text{ROM} = (\text{TR} - \text{TC}) / \text{TR}$$

Where TR and TC are total revenue and total costs respectively.

#### **4.5.12 Telecommunication Components Industry**

Telecommunication industry can be classified into the network equipment and the consumer premises equipment sectors. Network equipment includes equipment that the telecommunication

service provider must employ to connect ultimate users so they can communicate with each other minus the human network interface equipment.

## **4.6 Conclusion**

This chapter devoted to develop the theoretical foundation and research methodology. The small firm growth theory and competitive strategy have been investigated in the context of the current research. Further, an attempt has been made to examine relevance of business models developed in the context of large firm in small firm study. Small firms' complete model developed by Man and Chan (2002) and Jones (2000) are examined in the current context. Further an attempt has been made to examine application of Porter's generic model, market forces and value chain models in this study. Based on this investigation, separate models are developed for measuring influence of organizational and financial factors, value chain factors and market forces on firm performance. A detailed discussion on research methodology is carried out in this chapter. Details on development of test instrument, design and discussion of questionnaire and tools for data analysis are discussed in this chapter. Details of the concepts and terms used in the thesis also explained in this chapter.

## **Chapter 5**

### **Findings and Discussion**

#### **5.1 Introduction**

This chapter focuses on empirical analysis based on the primary data collected from filed survey. The discussion proceeds in three broad sections. The Section 5.2 revolves around descriptions of the data, which includes demographics of the respondents, and distribution of firms based on capital investment, annual revenue and number of employees. The Section 5.3 deals with detailed data analysis and discussion, which is subdivided into three subsections. While the first subsection (5.3.1) examines influence of organizational and financial factors on firm performance the second (5.3.2) tests influence of value chain factors on performance. The third subsection (5.3.3) is confined to the investigation regarding the influence of market forces on firm performance. In the outset, consistency reliability of the data is tested, which is followed by the causality analysis. The causality analysis examines causal relationship between small firm performance, and different variables associated with organizational and financial factors; value chain factors; and market forces. The Section 5.4 verifies hypotheses of the study and the Section 5.4 recapitulates major findings of the study.

#### **5.2 Discussion of the Data**

The general discussion regarding the primary data collection from filed survey is carried out in this section. The demographics of the respondents, classification of firms based on capital investment and annual revenue, corresponding to number of employees are discussed. Further, description of each variable that has been used in this study, question corresponding to each variable, ranges of the values are also given. This discussion begins with demographics of the respondents, which is given in Table 5.1. Respondent's job titles indicate that fifty four per cent of the respondents are CEOs (President or Chairman of the firm), ten per cent Directors and fourteen per cent Vice Presidents. Further, four per cent are Project Managers, two per cent each Department Head and CFO and six per cent others. Analysis on their functional categories reveals that 28 per cent of the respondents are working in the corporate level while others are



working in the function level of R&D, finance, engineering, administration, manufacturing, and marketing

. Table 5.1 Selected Demographics Reported by Respondents

Job Title	Count and Percentage within Job Function	Respondents Job Function (count and percentage)							Total
		Corporate	R&D	Finance	Engineering	Administration	Manufacturing	Marketing & Sales	Corporate
<b>CEO/President/Chairman</b>	Count	14	3	2	2	3	3	0	27
	%	100.0	100.0	50.0	25.0	75.0	60.0	0	54.0
<b>Director</b>	Count	0	0	0	2	0	0	3	5
	%	0	0	0	25.0	0	0	25.0	10.0
<b>VP</b>	Count	0	0	0	2	1	0	4	7
	%	0	0	0	25.0	25.0	0	33.3	14.0
<b>GM</b>	Count	0	0	0	0	0	2.0	1	3
	%	0	0	0	0	0	40.0	8.3	6.0
<b>Project Manager</b>	Count	0	0	0	1	0	0	1	2
	%	0	0	0	12.5	0	0	8.3	4.0
<b>Dept. Head</b>	Count	0	0	0	0	0	0	1	1
	%	0	0	0	0	0	0	8.3	2.0
<b>CFO</b>	Count	0	0	2	0	0	0	0	2
	%	0	0	50.0	0	0	0	0	4.0
<b>Others</b>	Count	0	0	0	1	0	0	2	3
	%	0	0	0	12.5	0	0	16.7	6.0
<b>Total</b>	<b>Count</b>	<b>14</b>	<b>3</b>	<b>4</b>	<b>8</b>	<b>4</b>	<b>5</b>	<b>12</b>	<b>50</b>
	<b>%</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

The distribution of the firms based on its capital investment and annual revenue is given in Table 5.2. The capital investment-wise classification indicates that fifty four per cent of the firms

belong to the size class less than \$5 million investment and seventy four per cent in the category of capital investment less than \$10 million. However, six per cent of the firms belong to the size class of greater than \$20 million capital investment. The distribution of the firms corresponding to capital investment and annual revenue reveals that 11.1 per cent of the companies generating \$20 million or more annual revenue belong to the size class of \$5 million capital investment and more than sixty per cent of the companies with less than \$15 million capital investment generate \$20 million as annual revenue. However, 22.2 per cent of the companies with \$20 million or more capital investment generate \$20 million or more annual revenue. It implies that the annual revenue need not directly relate to the capital investment of the firm.

Table 5.2 Distribution of firms corresponding to capital investment and annual revenue

Capital Investment in \$ Million	% Within Annual Revenue (Revenue in \$ Million)					% to Total
	0-0.99	1-4.99	5-9.99	10-19.99	20 or more	
<b>0 – 4.99</b>	42.9	85.0	50.0	33.3	11.1	<b>54.0</b>
<b>5 - 9.99</b>	28.6	5.0	50.0	16.7	22.2	<b>20.0</b>
<b>10-14.99</b>	14.3	5.0	0.0	50.0	33.3	<b>16.0</b>
<b>14-19.99</b>	0.0	5.0	0.0	0.0	11.1	<b>4.0</b>
<b>20 or more</b>	14.3	0.0	0.0	0.0	22.2	<b>6.0</b>
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

Distribution of firms corresponding to the number of workers and annual revenue is given in Table 5.3. The result of the analysis indicates that about fifty per cent of firms belong to the size class of less than fifty employees and about 90 per cent of the companies belong to the category of less than 300 employees. However, only two per cent of companies fell in the range of 401 to 499 employees. While the 57.1 per cent of the companies with less than 50 employees generates only \$1 million annually, the 66 per cent of companies with less than 200 employees generate \$20 million or more annual revenue.

Table 5.3 Distribution of firms corresponding to number of employees and annual revenue

Number of Employees	% Within Annual Revenue (Revenue in \$ Million)					% to Total
	0-0.99	1-4.99	5-9.99	10-19.99	20 or more	
<b>Less than 50</b>	57.1	90.0	25.0	0.0	11.1	<b>50.0</b>
<b>51-100</b>	28.6	5.0	75.0	50.0	22.2	<b>28.0</b>
<b>101-200</b>	0.0	5.0	0.0	33.3	33.3	<b>12.0</b>
<b>201-300</b>	0.0	0.0	0.0	0.0	22.2	<b>4.0</b>
<b>301-400</b>	0.0	0.0	0.0	16.7	11.1	<b>4.0</b>
<b>401-499</b>	14.3	0.0	0.0	0.0	0.9	<b>2.0</b>
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

The detailed description of each variable corresponding to survey questions, coded values and ranges of values for each question from the survey instrument, is presented in Table 5.4. Organizational and financial factors consist of four independent variables viz. organizational flexibility, structural flexibility, strategic flexibility and financial flexibility. These variables are coded as b1, b2, b3 and b4. Each of these variables consists of many items, and is coded with five-point Likert scale varying 1 to 5 depending on relative importance. Value chain factors consist of nine independent variables viz. inbound logistics, operation, outbound logistics, market & sales, services, infrastructure, human resources, technology development and procurement. These variables are coded as c1, c2, c3, c4, c5, c6, c7, c8 and c9, and consist of several items (questions) to get maximum possible information from the informants. Market forces consist of six independent variables viz: supply power, buyer power, current competition, new entry, substitute products and complementary products which are coded as d1, d2, d3, d4, d5 and d6 respectively. Each of these variables is derived from set of items (questions) with five point Likert scales. Lastly the composite and individual performance indices are given. These variables are coded as e, e1, e2, e3, e4 and e5 respectively.

Table 5.4 Variables and Coding

Sl. No.	Variables	Survey Question	Coded Values	Corresponding Values in the Range of
1	Operational Flexibility	b.1	1-5	4 to 20 in b1
2	Structural Flexibility	b.2	1-5	5 to 25 in b2
3	Strategic Flexibility	b.3	1-5	4 to 20 in b3
4	Financial Flexibility	b.4	1-5	4 to 20 in b3
5	Inbound Logistics	c.1	1-5	4 to 20 in c1
6	Operation	c.2	1-5	7 to 35 in c2
7	Outbound Logistics	c.3	1-5	2 to 10 in c3
8	Sales & Marketing	c.4	1-5	4 to 20 in c4
9	Services	c.6	1-5	3 to 15 in c5
10	Infrastructure	c.6	1-5	5 to 25 in c6
11	Human Resources	c.7	1-5	5to 25 in c7
12	Tech: development	c.8	1-5	3 to 15 in c8
13	Procurement	c.9	1-5	4 to 20 in c9
14	Supplier Power	d.1	1-5	7 to 35 in d1
15	Buyer Power	d.2	1-5	9 to 45 in d2
16	Current Competition	d.3	1-5	11to 55 in d3
17	New Entry	d.4	1-5	11 to 55 in d4
18	Substitute Product	d.5	1-5	3 to 15 in d5
19	Complementary Product	d.6	1-5	3 to 15 in d6
20	Weighted Index of Performance (CPI)	e	1-5	1 to 5 in e
21	Market Share (MS)	e.1	1-5	1 to 5 in e1
22	Return on Investment (ROI)	e.2	1-5	1 to 5 in e2
23	Revenue per Employee (RPE)	e.3	1-5	1 to 5 in e3
24	Value Added (VA)	e.4	1-5	1 to 5 in e4
25	Returned on Management (ROM)	e.5	1-5	1 to 5 in e5

## **5.3 Data Analysis and Discussion**

The empirical analysis proceeds in three different sections. While the first section examines influence of organizational and financial factors on firm performance, the second examines that of value chain factors on performance. The third section investigates influence of market forces on performance. Before performing the detailed analysis reliability and consistency is carried out using Cronbach's alpha. A variable with Cronbach's alpha 0.70 or greater is the stipulated condition for selecting it for further analysis. The item total correlation, the correlation between each item and the total score, is also taken into consideration for deleting an item from any variable. The models that have been developed are refined eliminating insignificant observed variables. Subsequently, regressions have been run using control variable to test influence of each variable on firm performance.

### **5.3.1 Causality Analysis between Performance and Organizational and Financial Factors**

The main goal of this analysis is to examine influence of operational flexibility, structural flexibility, strategic flexibility and financial flexibility on firm performance with the help of regression analysis. The correlation between performance and different variables associated organizational and financial factors are tested before conducting causality analysis. The analysis begins with the test of internal consistency reliability of operational flexibility, structural flexibility, strategic flexibility and financial flexibility. The test result is given in Table 5.5.

The four initial scale items of operational flexibility are flexibility in disposing excess production capacity, outsourcing, using of temporary personnel and selecting different suppliers. The Cronbach's alpha value of operational flexibility consisting of these four items was only 0.57. An inspection of the test result indicated that the scale reliability could be improved by elimination of excess production capacity (b11) and outsourcing (b12). A reanalysis with these two items removed from the final scale indicated that scale reliability measurably improved (Cronbach's alpha 0.75), and reached conventional standards for scale reliability. The final scale used to measure influence of operational flexibility on firm performance consisted of the sum total of the responses across the flexibility in using temporary personnel and selection of different suppliers. The reliability of the scale to measure structural flexibility is examined next. The five initial scale items of structural flexibility are workforce enlargement, alteration of control system, creation of multifunctional team, conjoint manufacturing, and conjoint design.

The Cronbach's alpha for these items was 0.50. An inspection of the test result indicated that the scale reliability could be improved by elimination of workforce enlargement (b21), and creation of multifunctional team (b23). A reanalysis with the remaining three items indicated that scale reliability measurably improved (Cronbach's alpha 0.73), and reached conventional standards for scale reliability. The final scale used to measure structural flexibility consisted of the sum total of the responses across the scale items of alteration of control system (b22), conjoint manufacturing (b24) and conjoint design (b25). The initial scales analysis in strategic flexibility consisting of four items demonstrated the accepted level of reliability with Cronbach's alpha coefficient 0.78 which is at the stipulated level. The last component of organizational and financial factors is financial flexibility, which consists of four scale items. The Cronbach's alpha of financial flexibility consisting of these four scale items was 0.51, which is improved above the conventional standard with the reanalysis by removing two items. The final scale used to measure financial flexibility of the company consisted of two items; use of short-term contract (b41) and ability to access to financial resources (b42). Some of the items with items total correlation greater than 0.30 are also removed so as to improve reliability level. The models that have been developed and presented in Chapter 4 are revised eliminating insignificant observed variables based on above analysis. The revised model for analyzing influence of organizational and financial factors on firm performance is presented in Figure 5.1.

Table 5.5 Results of internal consistency reliability test of organizational and financial factors

<b>Control Variables</b>	<b>Number of Items</b>	<b>Item</b>	<b>Mean</b>	<b>SD</b>	<b>Cronbach's Alpha</b>	<b>Items Total Correlation</b>
<b>Operational Flexibility (b1)</b>	4 (2)	b11 (-)	2.74	1.030	0.57 (0.75)	0.100
		b12 (-)	3.28	1.262		0.467
		b13	3.16	0.934		0.130
		b14	3.42	0.859		0.490
<b>Structural Flexibility (b2)</b>	5(3)	b21 (-)	3.14	0.904	0.50 (0.73)	-0.209
		b22	3.04	0.989		0.264
		b23 (-)	3.84	0.817		0.238
		b24	3.00	1.030		0.611
		b25	3.12	1.020		0.600
<b>Strategic Flexibility (b3)</b>	4	b31	3.80	0.833	0.708	0.454
		b32	3.58	0.785		0.466
		b33	3.38	1.067		0.479
		b34	3.36	0.851		0.604
<b>Financial Flexibility (b4)</b>	4(2)	b41 (-)	3.70	0.886	0.51 (0.70)	0.087
		b42 (-)	3.56	0.705		0.215
		b43	3.52	0.735		0.527
		b44	3.82	0.825		0.445

Revised model for measuring influence of organizational and financial factors on firm performance

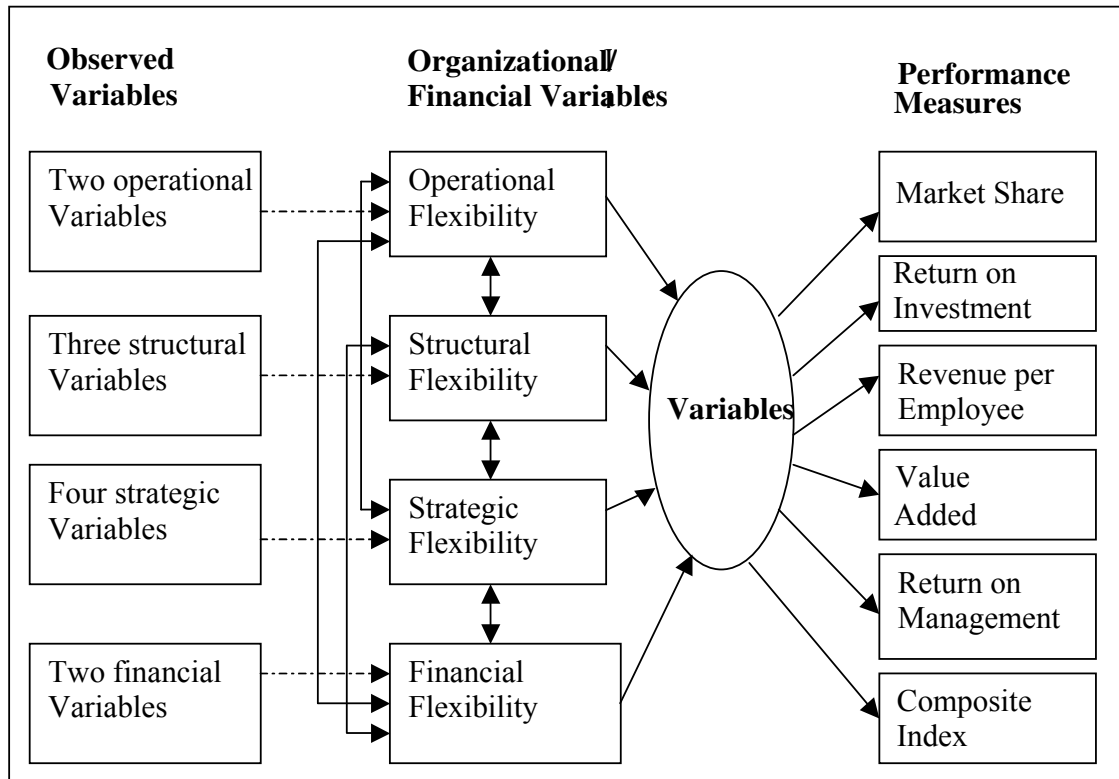


Figure 5.1 Model for measuring influence of organizational and financial factors on performance

The revised model for measuring firm performance using organizational and financial factors is mathematically written as:

$$Y_{Ai} = f(OF, SF, STF, FF)$$

$Y_{Ai} = f(OF, SF, STF, FF)$  where  $Y_{Ai}$ 's ( $i = 1, 2, 3, 4, 5$  and  $6$ ) are performance measures; Composite Performance Indices; Market Share, Return on Investment, Revenue per Employee, Value Added and Return on Management; and independent variables are as follows:

OF: Operational Flexibility

SF: Structural Flexibility

STF: Strategic Flexibility

FF: Financial Flexibility



The next attempt is to examine descriptive statistics and inter-correlation between various performances. The details of the descriptive statistics and results of the inter-correlation analysis are given in Table 5.6.

Table 5.6 Descriptive statistics and inter-correlation coefficients of organization and financial factors

Sl. No.	Item Description	Mean	S D	N	Inter-correlation Coefficients					
					CPI	MS	ROI	RPE	VA	ROM
1	CPI	3.28	0.46	50						
2	MS	3.44	0.64	50						
3	ROI	3.42	0.86	50						
4	RPE	3.38	0.73	50						
5	VA	3.12	0.59	50						
6	ROM	3.20	0.67	50						
7	Operational Flexibility	6.58	1.61	50	0.08	0.12	-0.09	-0.07	0.03	0.23
8	Structural Flexibility	9.16	2.44	50	0.02	0.11	-0.12	-0.10	-0.10	0.08
9	Strategic Flexibility	14.20	2.60	50	0.52	0.22	0.34	0.16	0.45	0.30
10	Financial Flexibility	7.34	1.36	50	0.68	0.41	0.45	0.36	0.33	0.37

The mean scale values of all performance measures are greater than three. Value added has the lowest mean value (3.12) with stand error 0.59 and market share has the highest value (3.44) with standard error 0.64. The results of inter-correlation analysis reveal the correlation between various components of organizational financial factors and different performance measures. While the composite performance index correlated highly with strategic flexibility (0.52) and financial flexibility (0.68) it is correlated with operational flexibility (0.08) and structural flexibility (0.02) nominally.

The next attempt is to examine correlation of individual performance measures with the components of organizational and financial factors. Market share correlated with all the four components of organizational and financial factors; operational flexibility (0.12), structural flexibility (0.11), strategic flexibility (0.22), and financial flexibility (0.41). Return on investment is correlated negatively with two components and positively with other two, operational flexibility (-0.09), structural flexibility (-0.12), strategic flexibility (0.34), and financial flexibility (0.45). The pattern of correlation of RPE is almost similar; operational flexibility (-0.07), structural flexibility (-0.10), strategic flexibility (0.16) and financial flexibility (0.36). The correlation coefficients of value added (VA) and components of organizational financial factors are; operational flexibility (0.03), structural flexibility (-0.10), strategic flexibility (0.45) and financial flexibility (0.33). Finally, correlation between return on management (ROM) and components of organizational factors are; operational flexibility (0.23), structural flexibility (0.08), strategic flexibility (0.30), and financial flexibility (0.37). The analysis reveals the correlation between firm performance and various factors of organizational factors. However, a detailed regression analysis is required to verify its causality.

Separate regression models have been used to test causality between firm performance indicators and organizational and financial factors. The composite index and individual performance measures are used as controlled variables. Goodness of fit of the regression model with composite index as dependent variable and financial flexibility, structural flexibility, operation flexibility and strategic flexibility as independent variables is tested first. Subsequently tested, goodness of fit of models with individual performance indicators; MS, ROI, RPE, VA and ROM as dependent variables keeping the same set of independent variables. Summary results of the goodness of fit test are given in Table 5.7.

Table 5.7 Model Summaries

Model	Dependent Variables	R Square	Adjusted R Square	Durbin Watson	F	Sig
1	Composite Performance Index	0.518	0.475	2.074	12.10	.000*
2	Market Share	0.181	0.108	1.923	2.48	0.057
3	Return on Investment	0.256	0.190	2.086	3.87	0.009
4	Revenue per Employee	0.151	0.075	2.423	2.00	0.111
5	Value Added	0.252	0.186	1.975	3.80	0.010
6	Return on Management	0.206	0.135	2.044	2.91	0.032

\* Significance at 5 per cent level

The model with composite index as performance indicators reveals that 47.5 per cent variation in firm performance is explained by the variations in financial flexibility; structural flexibility, operation flexibility and strategic flexibility. The coefficient of determination (R<sup>2</sup>) is 0.518 (F = 12.10) with significance level (0.000). It is evident from the above information that this model is a good fit for measuring causality between performance and organizational and financial factors. The model with market share as dependent variable indicates that 10.8 per cent variation in performance is explained by the variation of financial flexibility, structural flexibility, operation flexibility and strategic flexibility. The coefficient of determination (R<sup>2</sup>) is 0.181 (F = 2.48) with significance level (0.057). The model with return on investment as performance measure with the same set of independent variables indicates that 19 per cent variation in performance is explained by the aforesaid set of variables. The coefficient of determination (R<sup>2</sup>) is 0.256 (F = 3.87) with significance level (0.009). The model with revenue per employee as performance indicator reveals that 8 per cent variation in performance is explained by the variation in financial flexibility, structural flexibility, operation flexibility and strategic flexibility. The coefficient of determination (R<sup>2</sup>) is 0.151 (F = 2.00) with significance level (0.111). The model with value added as performance measure reveals that 19 per cent of variations in performance is explained by the variation in independent variables. The coefficient of determination (R<sup>2</sup>) is 0.252 (F = 3.80) with significance level (0.010). Finally, the model with return on management as independent variable reveals that 14 per cent variations in firm performance is explained by financial flexibility, structural flexibility, operation flexibility and strategic flexibility. The coefficient of determination (R<sup>2</sup>) is 0.206 (F = 2.48) with significance level (0.032).

The results of the above test of goodness reveal that the model with composite index is a good fit, rather than models with individual performance indicators. Models with ROI, VA and ROM are significant at 5 per cent probability level. Typically, the model could not be fit for the data if the level of significance is greater than five. Although the further analysis focuses mainly on composite performance index analysis with individual indicators is also carried out simultaneously. The Durbin Watson value closer to two indicates that there will be no first order serial correlation.

The final step of the empirical analysis in this phase is examining the causal relationship between performance and various factors of organizational and financial factors with the help of regression analysis. Regression has been carried out for each performance measures using operational flexibility, structural flexibility, strategic flexibility and financial flexibility as control variables. A summary result of the regression analysis is given in Table 5.8.

The regression analysis using composite performance index as controlled variable and operational flexibility, structural flexibility, strategic flexibility and financial flexibility as control variables is examined first. The results indicate that the coefficients of strategic flexibility (0.26) ( $t = 2.199$ ) and financial flexibility (0.56) ( $t = 4.688$ ) are positively and significantly different from zero at 0.05 per cent level. The positive coefficient indicates positive impact of independent variable on dependent variable, which implies strategic flexibility and financial flexibility influence firm performance. In other words increase in strategic flexibility and financial flexibility lead to increase in performance and vice versa. The coefficient of operational flexibility (0.067) and structural flexibility (-0.062) are not significantly different from zero which implies that the current evidences are not strong enough to make any specific conclusion regarding the influence of operational flexibility and structural flexibility on performance. Based on the above results, the first hypothesis that organizational and financial factor will have no influence on firm performance is rejected. Results of the regression using individual performance measures will be discussed after presenting important graphs associated with this analysis.

Table 5.8 Summary result of regression analysis showing influence of organizational financial factors on firm performance

Models	Performance Indicators	Organizational Financial Factors (Standardized Coefficients)			
		Operation Flexibility	Structural Flexibility	Strategic Flexibility	Financial Flexibility
1	Composite Index	0.067 (.624)	-0.062 (-.575)	0.263* (2.199)	0.555* (4.688)
2	Market Share	0.084 (.606)	0.067 (.479)	0.036 (0.230)	0.381* (2.467)
3	Return on Investment	-0.078 (-.584)	-0.147 (-1.101)	0.180 (1.212)	0.377* (2.562)
4	Revenue per Employee	-0.072 (-.510)	-0.106 (-.744)	-0.008 (-0.051)	0.376* (2.390)
5	Value Added	0.079 (.592)	-0.180 (-1.343)	0.418* (2.812)	0.131 (.885)
6	Return on Management	0.222 (1.619)	-0.008 (-.059)	0.183 (1.194)	0.269 (1.768)

+Values in the parentheses are t value

\* Values are significant at 5% probability level

## Histogram

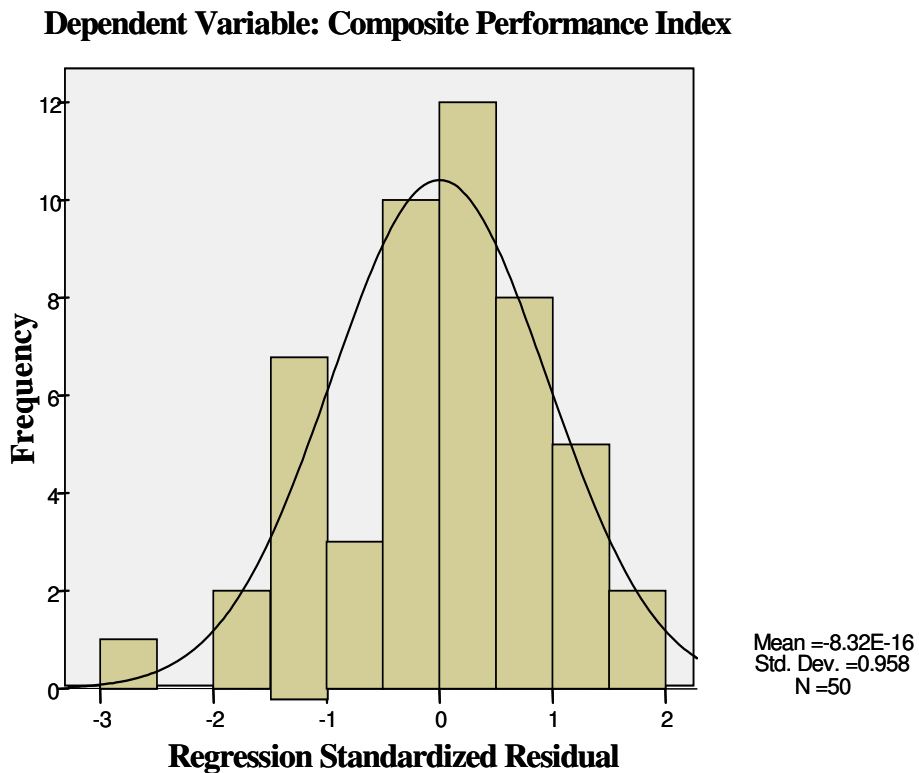


Figure 5.2 Standardized residual graph of composite performance

The fitted normal distribution onto a histogram of residuals gives a visual sense of adherence of residuals to the normal assumption. The histogram (Figure 5.2) and the P-P plot (5.3) of the standardized residual suggest that the residual is probably normally distributed. Figure 5.4 is the plot for the standardized predicted variable and the standardized residuals, which indicate no sign of heteroskedasticity.

**Normal P-P Plot of Regression Standardized Residual**

**Dependent Variable: Composite Performance Index**

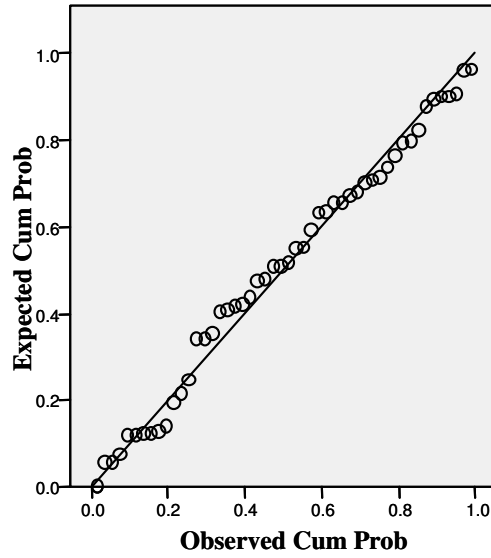


Figure 5.3 Plot of cumulative probability of composite performance

**Scatter plot**

**Dependent Variable: Composite Performance Index**

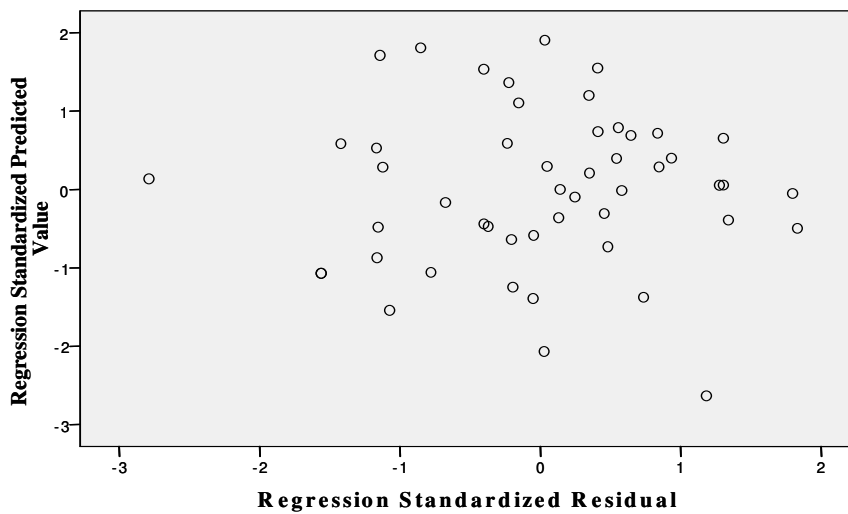


Figure 5.4 Standardized residuals plot of composite performance

The next attempt is to analyze causal relationship between individual performance measures, and organizational and financial factors. The regression results with market share as the controlled variable and operational flexibility, structural flexibility, strategic flexibility and financial flexibility as control variables indicate that the coefficient of financial flexibility (0.38) ( $t = 2.467$ ) is positively and significantly different from zero, which implies that financial flexibility influences firm performance. The coefficients of operational flexibility (0.084), structural flexibility (0.067), and strategic flexibility (0.036) are not significant. The analysis with return on investment as dependent variable indicates significant influence of financial flexibility, (0.377) ( $t = 2.56$ ), on firm performance. The coefficient of operational flexibility, structural flexibility and strategic flexibility is not significant and hence there is no evidence of its influence on performance. The result of the regression using revenue per employee indicates influence of financial flexibility (0.376) ( $t = 2.39$ ) on performance. However, there is a limitation to make any conclusion regarding this regression coefficient due to the problem of model fit. The results of the regression using value added as performance measure indicates that coefficient of strategic flexibility (0.418) ( $t = 2.81$ ) is positively and significantly different from zero which implies influence of strategic flexibility on firm performance. However, coefficients of operational flexibility, structural flexibility, and financial flexibility are not significantly different from zero. Finally, the results of the regression using return on management as performance indicator does not give any indication regarding influence of operational flexibility, structural flexibility, strategic flexibility and financial flexibility on firm performance.

The histogram of standardized residuals of market share (Figure 5.5), return on investment (Figure 5.6), revenue per employee (Figure 5.7), value added (Figure 5.8) and return on management (Figure 5.9) suggests that the residual is probably normally distributed.



### Histogram

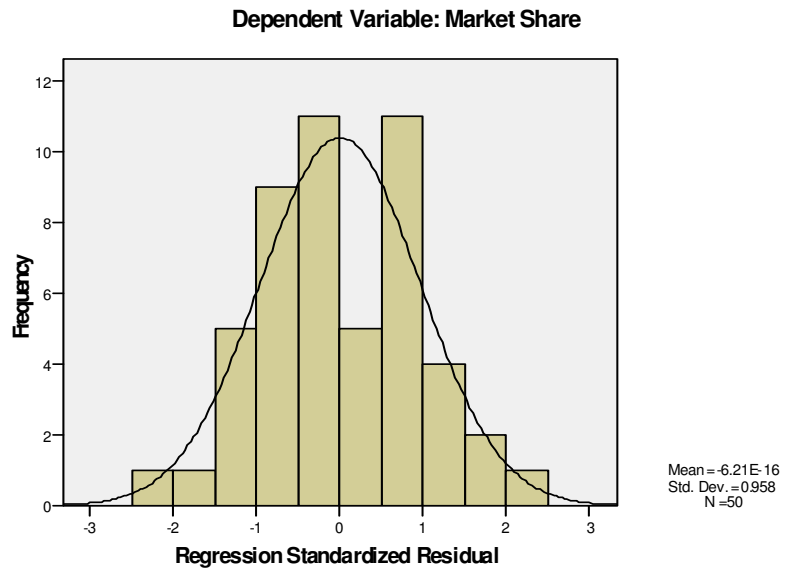


Figure 5.5 Standardized residuals graph of market share

### Histogram

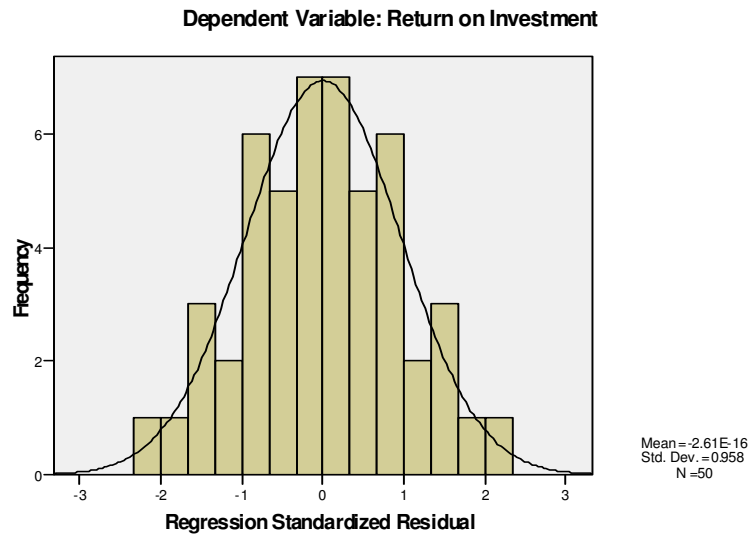


Figure 5.6 Standardized residual graph of return on investment

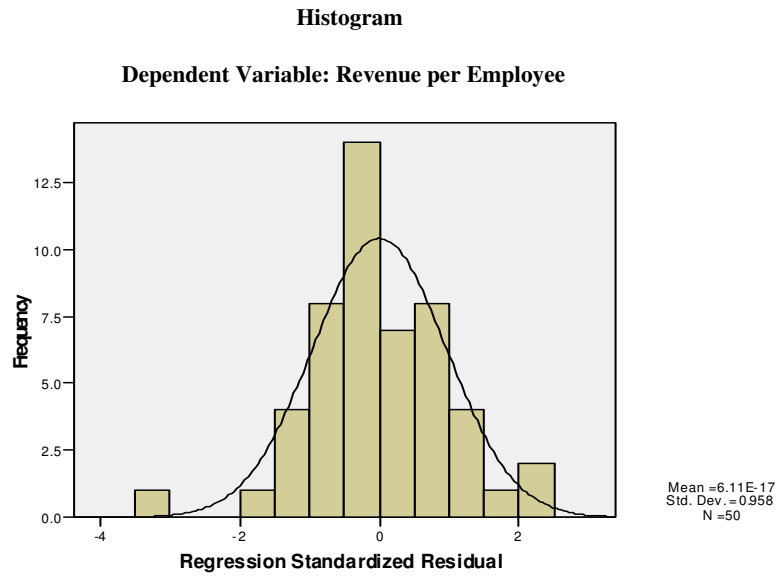


Figure 5.7 Standardized residual graph of revenue per employee

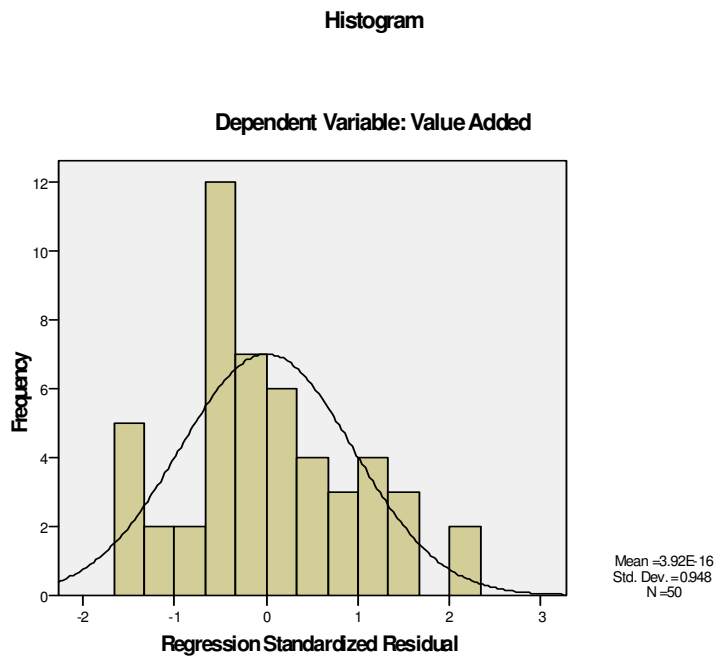


Figure 5.8 Standardized residual graph of value added

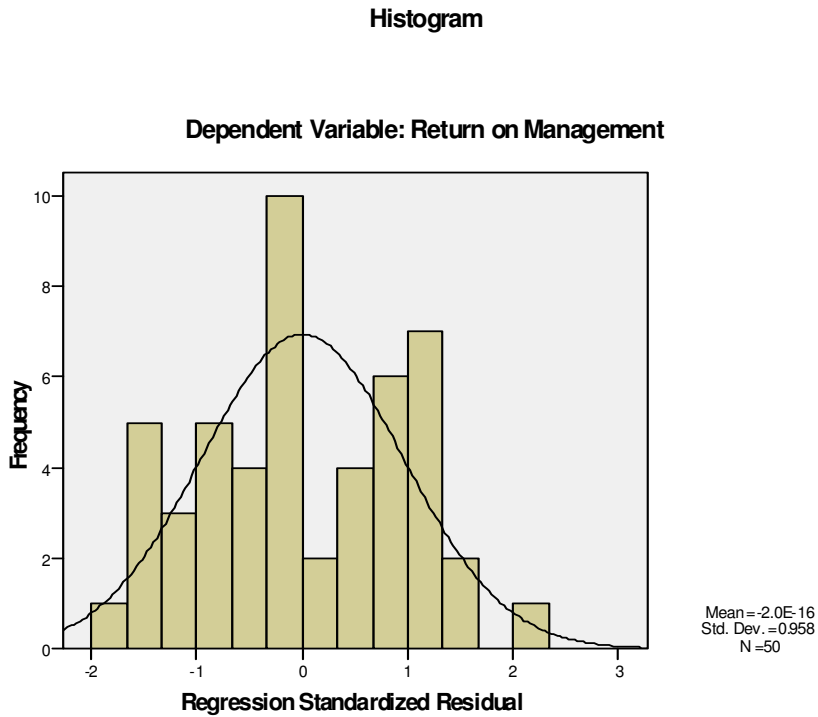


Figure 5.9 Standardized residual graph of return on management

### 5.3.2 Analysis of Value Chain Factors

The causality between firm performance and value chain factors is analyzed in this section. The main task is to examine influence of inbound logistics, operations, outbound logistics, sales and marketing, services, infrastructure, human resources, technical development and procurement on performance. The internal consistency and reliability of these variables are tested using Cronbach's alpha coefficients before conducting detailed analysis. The test results are given in Table 5.9.

Table 5.9 Results of internal consistency reliability test of value chain factors

<b>Control Variables</b>	<b>Number of Items</b>	<b>Item</b>	<b>Mean</b>	<b>SD</b>	<b>Cronbach's Alpha</b>	<b>Items total correlation</b>
<b>Inbound Logistics (c1)</b>	4 (2)	c11 (-)	3.58	0.950	0.60 (0.75)	0.45
		c12 (-)	3.74	0.986		0.19
		c13	3.74	0.965		0.42
		c14	3.42	1.01		0.49
<b>Operation (c2)</b>	7(5)	c21 (-)	4.26	0.78	0.67 (0.71)	0.22
		c22 (-)	4.48	0.71		0.38
		c23	4.52	0.61		0.39
		c24	4.16	0.77		0.27
		c25	4.32	0.71		0.51
		c26	4.18	0.75		0.41
		c27	4.40	0.67		0.53
<b>Outbound Logistics (c3)</b>	2(0)	c31 (-)	3.58	1.03	0.40	0.25
		c32 (-)	3.86	0.88		0.25
<b>Sales &amp; Marketing (c4)</b>	4(3)	c41	4.54	0.68	0.60 (0.70)	0.42
		c42	4.08	0.69		0.49
		c43	3.84	0.96		0.46
		c44 (-)	3.06	1.24		0.28
<b>Services (c5)</b>	3(0)	c51 (-)	4.62	0.60	0.66	0.41
		c52 (-)	4.58	0.67		0.41
		c53 (-)	3.54	1.37		0.47
<b>Infrastructure (c6)</b>	5	c61	4.36	0.69	0.71	0.34
		c62	3.86	0.90		0.46
		c63	3.92	0.80		0.53
		c64	4.18	0.74		0.53
		c65	3.74	1.0		0.50

Control Variables	Number of Items	Item	Mean	SD	Cronbach's Alpha	Items total correlation
<b>Human Resources (c7)</b>	5	c71	4.24	0.74	0.74	0.28
		c72	4.32	0.87		0.43
		c73	3.70	0.81		0.70
		c74	3.58	0.88		0.56
		c75	3.74	0.97		0.58
<b>Tech: development (c8)</b>	3(0)	c81 (-)	4.30	0.71	0.54	0.32
		c82 (-)	3.84	0.74		0.44
		c83 (-)	3.60	0.86		0.30
<b>Procurement (c9)</b>	4(0)	c91 (-)	4.12	0.82	0.47	0.23
		c92 (-)	4.02	0.77		0.10
		c93 (-)	3.50	0.93		0.50
		c94 (-)	3.40	1.07		0.27

The reliability of the scale to measure inbound logistics is tested first. The initial scale items of inbound logistics are receiving inventory, receiving inspection, inventory and inventory distribution, which has the Cronbach's alpha 0.60. An inspection of the test results indicates that the scale reliability could be improved by eliminating two items, receiving inventory (c11) and receiving inspection (c12). A reanalysis with these two items removed from the final scale indicates that the reliability measurably improved (Cronbach's alpha 0.75), and reached conventional standards for scale reliability. Thus, the final items used for measuring inbound logistics consisted of the scale items, inventory (c13) and inventory distribution (c14). The operation has seven initial scale items consisting of research and development, engineering, manufacturing, processing, workflow, records and documentation and quality control with Cronbach's alpha 0.67. A reanalysis by removing two items (R&D (c21) and engineering (c22)) from the final scale indicates that reliability could be improved above the conventional standards. The initial scale items of outbound logistics consisted of two items, which has Cronbach's alpha value 0.40. This is removed from further analysis since its item total correlations are also below the standard limit. The fourth component of value chain factor is sales and marketing & sales, which consisted of four scale items with Cronbach's alpha 0.60. Further analysis indicates that the Cronbach's alpha of sales and marketing & sales could be improved from 0.60 to 0.70 by

eliminating a scale item 'point of sale' (c44). The initial scale items of services consisting of three items; customer support, technical support and repair services; has Cronbach's alpha 0.66 which is removed from further analysis since these items did not meet the stipulated conditions. None of the scale items from infrastructure and human resources is removed since its Cronbach's alphas are above the stipulated levels, (0.71) and (0.74) respectively. The technology development consisting of three scale items with Cronbach's alpha 0.54 and procurement consisting of four scale items with Cronbach's alpha 0.47 are removed from further analysis since these components did not meet the stipulated conditions. The item total correlation of almost all the deleted items is less than 0.30, which is used as one of the conditions for eliminating item. The models that have been developed are revised removing the insignificant variables based on above analysis. The revised model connecting firm performance and value chain factors is presented in Figure 5.10. Revised model for measuring influence of value chain factors on firm performance

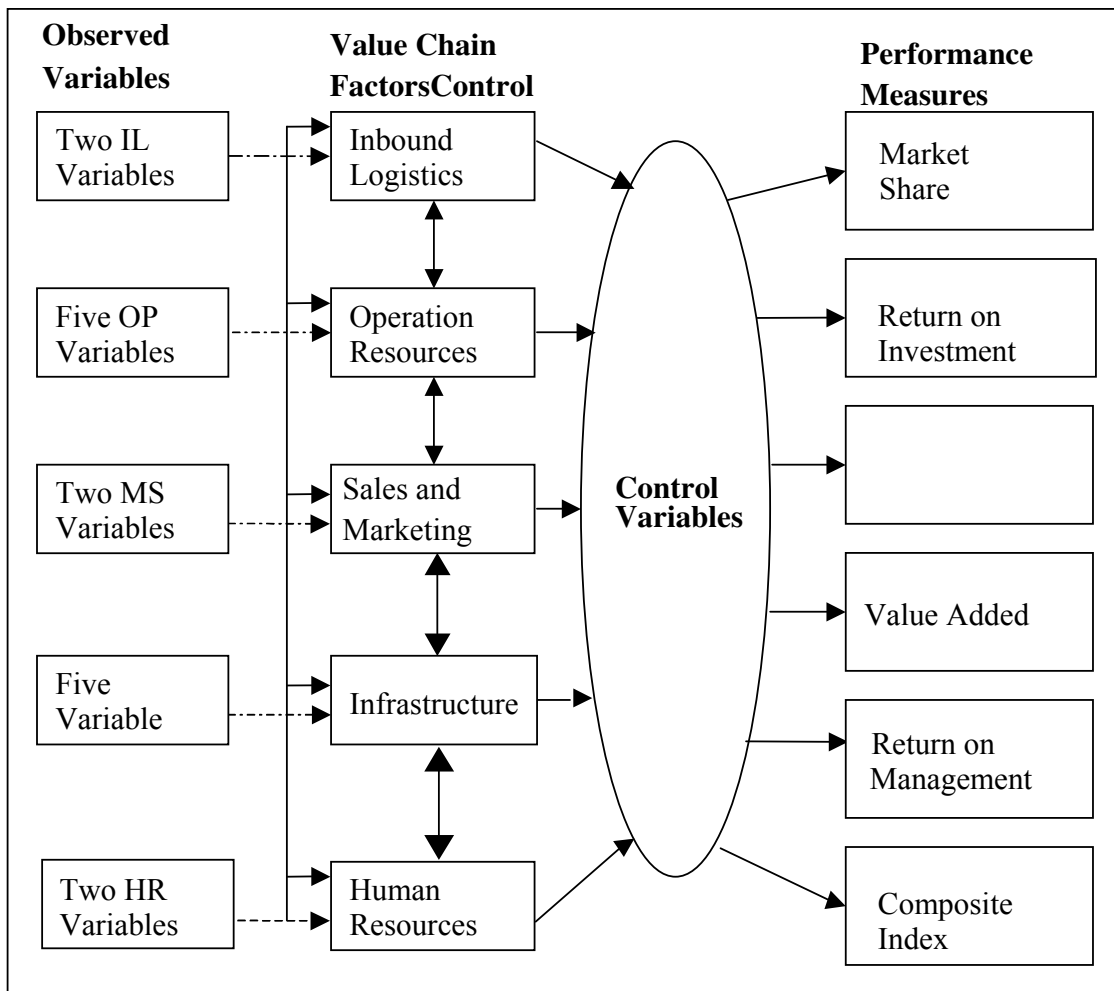


Figure 5.10 Revised model for measuring influence of value chain factors on firm performance

$Y = f(\text{value chain factors})$

The revised model for measuring firm performance using value chain factors is mathematically written as:

$YBi = f(\text{IL, OP, SM, IFR, HR})$  where  $YBi$ 's ( $i = 1, 2, 3, 4, 5$  and  $6$ ) are performance measures which are composite performance indices; Market Share, Return on Investment, Revenue per Employee, Value Added and Return on Management and IL, OP, SM, IFR, HR are independent value chain variables as follows.

IL: Inbound Logistics

OP: Operation Resources

SM: Sales and marketing

IFR: Infrastructure

HR: Human Resources

The correlation between firm performance and value chain factors is examined before conducting detailed analysis of causal relationship of these variables. The details of correlation analysis are given in Table 5.10.

The correlation between various performance measures and value chain factors is examined in this section. The results of the correlation analysis composite performance index and value chain factors indicate positive correlation of various value chain factors with inbound logistics (0.08), operations (0.52), sales and marketing (0.29), infrastructure (0.16), HR (0.24) and composite performance index, which implies that changes in any one of these variables may lead to a change in firm performance. The correlation results of the analysis with market share (MS) as performance measure indicate positive correlation of value chain factors inbound logistics (0.03), operations (0.35), sales and marketing (0.08), infrastructure (0.02), HR (0.08) with various value chain factors. It is apparent from the above results that operation is more correlated with Market Share (MS) than other variables. The results of the analysis indicate negative correlation with

inbound logistics (-0.14) and positive correlation with operations (0.43), sales and marketing (0.33), infrastructure (0.12) and HR (0.16) with return on investment (ROI). Revenue per employee (RPE) is correlated positive with all value chain factors; inbound logistics (0.18), operations (0.36), sales and marketing (0.22), infrastructure (0.06), HR (0.15). The results of the analysis with value added also indicate its positive correlation with value chain factors; inbound logistics (0.20), operations (0.01), sales and marketing (0.26), infrastructure (0.25) and HR (0.38). Finally, the results of the analysis indicate its positive correlation with inbound logistics (0.37), sales and marketing (0.22), infrastructure (0.15), HR (0.23) and a negative correlation with operations (-0.06) with return on management (ROM). Precisely, the above analysis clearly indicates the correlation between value chain factors and firm performance. However, further correlation analysis is not sufficient to make the conclusion regarding causality between performance and value chain factors, which is done with the help of a detailed regression analysis with the help of separate regression models.

Table 5.10 Correlation between performance measures and value chain factors

Sl. No.	Item Description	Mean	S D	N	Correlation Coefficients					
					CPI	MS	ROI	RPE	VA	ROM
1	Inbound Logistics	7.16	1.77	50	0.08	0.03	-0.14	0.18	0.20	0.37
2	Operations	21.58	2.40	50	0.52	0.35	0.43	0.36	0.01	-0.06
3	Sales and marketing	15.52	2.48	50	0.29	0.08	0.33	0.22	0.26	0.22
4	Infrastructure	20.06	2.85	50	0.16	0.02	0.12	0.06	0.25	0.15
5	HR	19.58	3.01	50	0.24	0.08	0.16	0.15	0.38	0.23

The goodness of fit of the regression line to the set of data used in each model is tested before conducting regression analysis. The model with composite index as dependent variable and inbound logistics, operations, sales and marketing, infrastructure and human resources as



independent variables is tested first. Subsequently goodness of fit of the models was tested with individual performance indicators as dependent variables by keeping the same independent variables. Summary results of goodness of fit are given in Table 5.11.

Table 5.11 Model Summary

<b>Models</b>	<b>R Square</b>	<b>Adjusted Square</b>	<b>R</b>	<b>Durbin-Watson</b>	<b>F</b>	<b>Sig</b>
<b>Composite Performance Index</b>	0.320	0.243		1.863	4.148	0.004
<b>Market Share</b>	0.130	0.031		1.795	1.309	0.277
<b>Return on Investment</b>	0.308	0.229		2.104	3.908	0.005
<b>Revenue per Employee</b>	0.197	0.106		2.238	2.158	0.076
<b>Value Added</b>	0.183	0.090		2.092	1.970	0.102
<b>Return on Management</b>	0.209	0.119		2.158	2.326	0.059

The regression model with composite performance index as controlled variable indicates that 24.3 per cent of the variations in firm performance are explained by the variation in inbound logistics, operations, sales and marketing, infrastructure and human resource. The coefficient of determination (R<sup>2</sup>) is 0.320 (F = 4.148) with significance level (0.004). Subsequently models with individual performance measures were analyzed. The regression model with Market Share as dependent variable indicates that only 3 per cent of total variation in performance is explained by the value chain factors. The determination coefficient (R<sup>2</sup>) is 0.130 (F = 1.309) with significance level (0.277). The model with ROI as performance measure indicates that the value chain factors explain 23 per cent of the variation in firm performance. The determination coefficient (R<sup>2</sup>) is 0.308 (F = 3.908) with significance level (0.005). The third regression model with RPE as dependent variable explains 10 per cent of variation in firm performance. The determination coefficient (R<sup>2</sup>) is 0.197 (F = 2.158) with significance level (0.076). The fourth model with VA as performance measure indicates that 9 per cent of variation in firm performance is explained by the value chain factors. The coefficient of determination (R<sup>2</sup>) is 0.183 (F = 1.970) with significance level (0.102). Finally, the regression line with ROM as controlled variable indicates that 12 per cent of variation in firm performance is explained by inbound logistics, operations, sales and marketing, infrastructure and human resource. The determination coefficient (R<sup>2</sup>) is 0.209 (F = 2.326) with significance level (0.059). Durban Watson value of all except market share is very close to 2, which indicates presence of no first order serial correlation. It is evident from the above analysis the regression model with

composite index is a good fit for the set of data used in the study. However, analysis with other models is also performed for the sake of comparison. The next attempt is to carry out regression analysis using these models. Summary result of regression analyzing is given in Table 5.12.

Table 5.12 Summary Result of Regression analysis showing influence of value chain factors on firm performance

Model	Performance Indicators	Value Chain Factors (Standardized Coefficients)				
		Inbound Logistics	Operations	Sales and Marketing	Infrastructure	Human Resources
1	Composite Performance Index	0.020 (.156)	0.485* (3.721)	0.248 (1.393)	-0.209 (-1.107)	0.103 (.605)
2	Market Share	-0.005 (-.032)	0.357* (2.416)	0.066 (0.327)	-0.145 (-0.681)	0.043 (0.226)
3	Return on Investment	-0.197 (-1.542)	0.412* (3.130)	0.399* (2.223)	-0.213 (-1.117)	-0.018 (-0.105)
4	Revenue per Employee	0.142 (1.030)	0.331* (2.338)	0.261 (1.352)	-0.278 (-1.357)	0.075 (0.408)
5	Value Added	0.159 (1.148)	-0.114 (-.798)	0.089 (.457)	-0.048 (-0.233)	0.369 (1.988)
6	Return on Management	0.362 (2.654)	-0.17 (-1.206)	0.19 (.993)	-0.108 (-0.530)	0.178 (0.976)

+Values in the parentheses are t value

\* Values are significant at 5% probability level

The result of the regression analysis using composite performance index as a performance measure indicates positively significant influence of operations (0.485) ( $t = 3.721$ ) which implies any change in operations influence performance of the firm. However, other variables show any indication of its significant influence on performance. The properties of the estimators have also been verified prior to examining regression results of the individual performance measures. The

residuals do not reveal any departure from normality. The fitted normal distribution onto a histogram of residuals gives a visual sense of adherence of residuals to the normal assumption. The histogram (Figure 5.11) and the P-P plot (5.12) of the standardized residual suggest that the residual is probably normally distributed. Figure 5.13 is the plot for the standardized predicted variable and the standardized residuals, which indicate no sign of heteroskedasticity.

### Histogram

**Dependent Variable: Composite Performance Index**

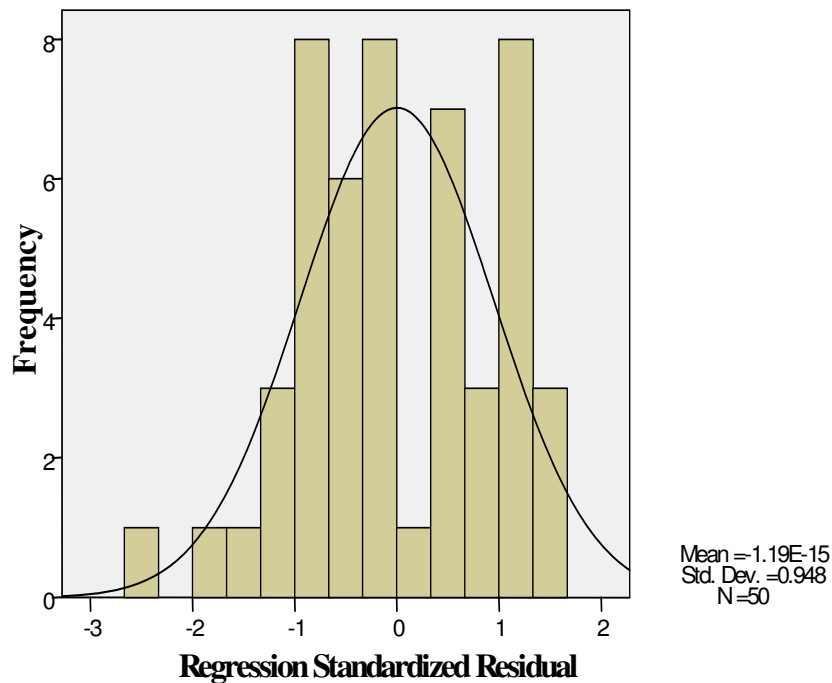


Figure 5.11 Regression Standardized Residuals

## Normal P-P Plot of Regression Standardized Residual

Dependent Variable: Composite Performance Index

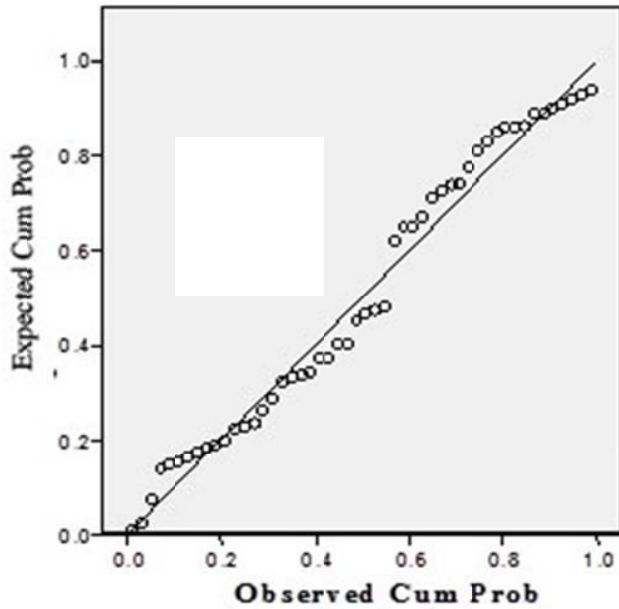


Figure 5.12 Plot of cumulative probability of composite performance

## Scatter plot

Dependent Variable: Composite Performance Index

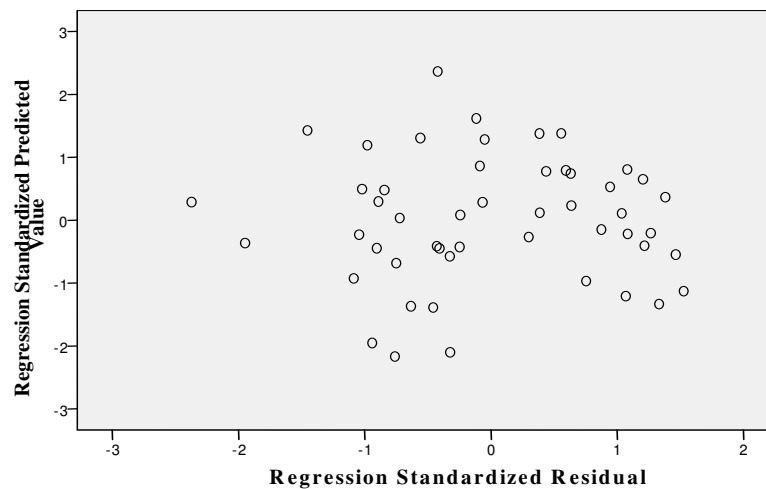


Figure 5.13 Standardized residuals graph of composite performance

The next attempt is to examine result of the regression analysis with individual performance indicators (Table 5.12). The regression results with market share as controlled variable and inbound logistics, operations, sales and marketing, infrastructure, and human resources as control variables indicate positively significant influence of operation (0.357) ( $t = 2.416$ ) on firm performance. However, inbound logistics (-0.005), sales and marketing (0.066), infrastructure (0.145) and human resources (0.043) do not show any significant influence on performance. The regression with ROI as performance measure indicates positively significant impact of operations, (0.412) ( $t = 3.13$ ) and sales and marketing (0.399) ( $t = 2.223$ ) on performance which implies that an increase in operations or sales and marketing leads to increased firm performance. However, coefficients of inbound logistics, infrastructure, and human resources do not show any sign of significant influence on performance. The result of the regression with RPE as performance measure indicates influence of operations (0.331) ( $t = 2.338$ ) on performance. However, coefficients of other variables are not significant. Finally, the results of the regression analysis with VA and ROM as performance measures are not enough to make any conclusion regarding influence of value chain factors on firm performance.

### **5.3.3 Analysis of Market Forces**

The causality between firm performance and market forces on performance is discussed in this section. Supplier power, buyer power, current competition, new entry, substitute product and complementary product are the control variables used in this analysis. The internal consistency and reliability of these variables are tested using Cronbach's alpha coefficients before conducting the detailed analysis. The test results are given in Table 5.13.

The reliability consistency of the scale items of supplier power is examined first. The initial scale items for supplier power with the items supplier domination, product differentiation, lack of substitute products, proportionate share of supply, intermediary product, forward integration and built-in switching costs has the Cronbach's alpha 0.62, which is improved above the conventional standard with the reanalysis by removing product differentiation (d12). Thus, the final scale used to measure supplier power consisting of six items has the Cronbach's alpha (0.70) at the conventional standard. The initial scale items of buyer power with the items buyer domination, undifferentiated product, substitute product, purchase volume, low switching costs, low profit margin, backward integration, informed buyer, unimportant to buyer's product has the Cronbach's alpha 0.39. An inspection of the data analysis indicated that the scale

Table 5.13 Results of internal consistency reliability test of market forces

Control Variables	Number of Items	Item	Mean	SD	Cronbach's Alpha	Items Total Correlation
<b>Supplier Power (d1)</b>	7 (6)	d11	3.32	1.06	0.62 (0.70)	0.45
		d12 (-)	3.46	0.91		0.12
		d13	3.78	0.86		0.51
		d14	3.42	1.11		0.27
		d15	3.88	0.94		0.44
		d16	2.78	0.99		0.25
		d17	3.08	0.90		0.35
<b>Buyer Power (d2)</b>	9 (7)	d21 (-)	3.26	0.99	0.39 (0.71)	0.07
		d22	2.82	0.92		0.51
		d23	2.94	0.91		0.34
		d24	3.10	0.93		0.24
		d25	2.76	0.92		0.27
		d26	2.52	0.93		0.42
		d27	2.62	0.83		0.15
		d28	3.50	1.07		0.31
		d29 (-)	2.52	2.98		0.24
<b>Current Competitors (d3)</b>	11 (9)	d31	3.52	1.02	0.68 (0.71)	0.54
		d32	3.94	0.91		0.46
		d33	3.42	0.93		0.35
		d34	3.90	0.95		0.26
		d35	3.34	0.94		0.43
		d36	3.40	0.90		0.30
		d37	3.42	0.84		0.28
		d38 (-)	4.14	0.70		0.17
		d39	4.34	0.82		0.30

Control Variables	Number of Items	Item	Mean	SD	Cronbach's Alpha	Items Total Correlation
		d310	3.96	0.86		0.42
		d311 (-)	4.22	0.84		0.06
<b>New Entry (d4)</b>	11 (10)	d41	3.20	0.90	0.69 (0.72)	0.34
		d42	3.22	0.87		0.36
		d43	3.08	0.80		0.33
		d44	3.68	0.82		0.45
		d45 (-)	3.32	0.94		0.03
		d46	3.28	1.05		0.09
		d47	3.12	0.94		0.34
		d48	2.88	1.17		0.43
		d49	2.74	1.00		0.30
		d410	3.56	0.97		0.62
		d411	3.42	1.03		0.55
<b>Substitute Product (d5)</b>	3 (0)	d51 (-)	3.82	1.06	0.52	0.31
		d52 (-)	3.24	1.15		0.33
		d53 (-)	3.86	0.95		0.36
<b>Complementary Product (d6)</b>	3	d61	3.62	0.94	0.80	0.75
		d62	3.58	1.03		0.64
		d63	3.52	0.99		0.56

reliability could be improved by elimination of buyer domination (d21) and unimportant to buyer's product (d29). The reanalysis with these two items removed from the final scale indicates that scale reliability measurably improved and Cronbach's alpha (0.71) reached above the conventional standards for scale reliability. The initial scale items of current competition with the items new business line, product differentiation, just-in-time delivery, delivery lead-time, capital mobilization ability, price differentiation, cost leadership, service quality, ability to exploit niche market, ability to take risk to introduce new product and workers commitment has the Cronbach's alpha 0.68. A reanalysis with two items, service quality (d38) and workers commitment (d311), removed from the final scale indicates that scale reliability measurably

improved and Cronbach's alpha reached above conventional standards (0.71) for scale reliability. The initial scale items of new entry with eleven items have 0.69. A reanalysis with one item, (d45), removed from the final scale indicates that scale reliability measurably improved and Cronbach's alpha (0.72) reached above conventional standards. The initial scale items of substitute product contain three items with Cronbach's alpha 0.52. There was no indication of increasing this Cronbach's alpha with reanalysis and hence it is removed from further analysis. Finally, the initial scales analysis of complementary product demonstrates the accepted level of reliability, as the Cronbach's alpha is 0.80, which is above the conventional standard. Based on the results of the above analysis the model that has been developed for illustrating the causality between performance and market forces is revised and presented in Figure 5.14.

Revised model for measuring influence of market forces on firm performance

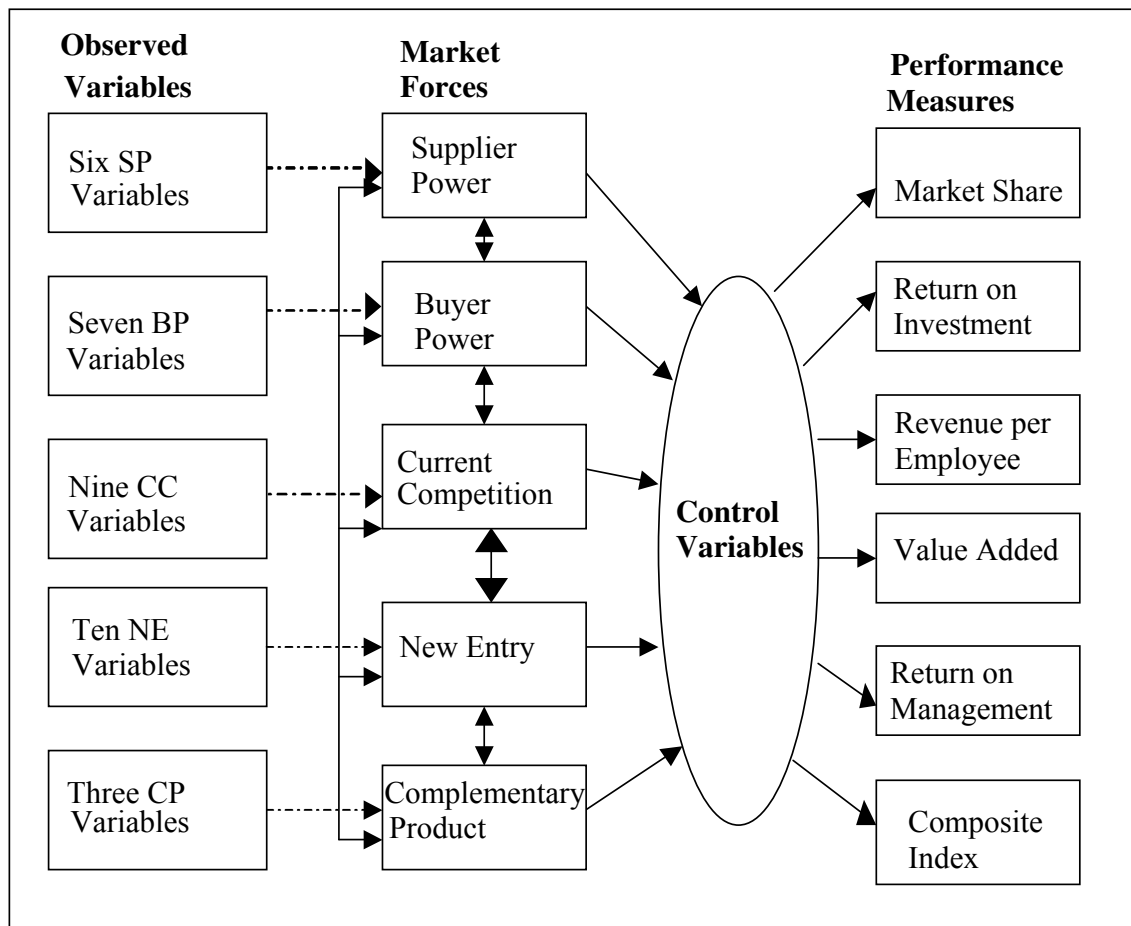


Figure 5.14 Revised model for measuring influence of market forces on firm performance



$Y = f(\text{market forces})$

$Y_{Ci} = f(\text{SP, BP, CC, NE, CP})$  where  $Y_{Ci}$ 's ( $i = 1, 2, 3, 4, 5$  and  $6$ ) are performance measures which are Composite Performance Indices; Market Share, Return on Investment, Revenue per Employee, Value Added and Return on Management and SP, BP, CC, NE and CP are market forces.

SP: Supplier Power

BP: Buyer Power

CC: Current Competition

NE: New Entry

CP: Substitute Product

The descriptive statistic for market forces and inter-correlation between performance indices and market forces are given in Table 5.14.

Table 5.14 Descriptive Statistics various performance indicators and market forces with related inter-correlation values

Sl. No.	Item Description	Mean	S D	N	Correlation Coefficient					
					CPI	MS	ROI	RPE	VA	ROM
1	Supplier Power	20.3	3.55	50	-0.55	0.41	0.54	0.32	0.31	-0.20
2	Buyer Power	20.3	3.92	50	-0.43	-0.35	-0.19	-0.32	-0.31	-0.41
3	Current Competitors	33.2	4.50	50	0.70	0.40	0.58	0.33	0.33	0.23
4	New Entry	32.2	5.50	50	0.75	0.38	0.49	0.42	0.59	0.40
5	Complementary Products	10.7	2.52	50	0.22	0.13	0.19	0.15	0.16	-0.50

The results of the inter-correlations between composite performances index and market forces reveal negative correlation of supplier power (-0.55) and buyer power (-0.43) with composite performance indices. The results also indicate that firm performance is strongly correlated with new entry (0.75) and current competition (0.70), which implies that the firm performance increases when the competitors are strong or new competitors enter in to the market. Further investigation reveals that all individual performance indicators correlated positively with current competition and new entry, which indicates that firm performance increases when competition increases or new firms enter in to the market. Although the complementary product is also positively correlated with all individual performance measures it is not strong as in the previous cases. As in the case of organizational and financial factors and value chain factors the results of the analysis indicates correlation between firm performance and market forces. However, further analysis is required to know the causality between firm performance and market forces, which is done using regression analysis.

Goodness of fit of the model with composite index as controlled variable and supplier power, buyer power, current competition, new entry, and complementary product as control variables is tested first. Goodness of the models with individual performance indicators (market share, return on investment, revenue per employee, value added and return on management) as dependent variables with the same independent variables are tested subsequently. Summary results of goodness of model fit are given in Table 5.15.

Table 5.15 Model Summary and Significance

<b>Models</b>	<b>R Square</b>	<b>Adjusted R Square</b>	<b>Durbin-Watson</b>	<b>F</b>	<b>Significance Level</b>
<b>Composite Performance Index</b>	0.717	0.684	1.616	22.254	.000*
<b>Market Share</b>	0.293	0.212	2.142	3.642	.008
<b>Return on Investment</b>	0.432	0.368	1.480	6.695	.000*
<b>Revenue per Employee</b>	0.233	0.146	2.309	2.669	.034
<b>Value Added</b>	0.387	0.317	1.737	5.546	.000*
<b>Return on Management</b>	0.326	0.249	2.060	4.247	.003

\* Significant at 1% probability level

The model with composite index as performance indicator indicates that supplier power, buyer power, current competition, new entry and complementary product explain 68.4 per cent of the variations in firm performance. The determination coefficient (R<sup>2</sup>) is 0.717 (F = 22.254) with level of significance (0.000). The model with market share as performance indicator with the same set of control variables indicates that 21 per cent of the variation in performance is explained by supplier power, buyer power, current competition, new entry, and complementary product. The determination (R<sup>2</sup>) is 0.293 (F = 3.642) with level of significance (0.008). The model with return on investment as independent variable with the same set of control variables indicates that 36.8 per cent variation in dependent variable is explained by the independent variables. The coefficient of determination (R<sup>2</sup>) is 0.432 (F = 6.695) with level of significance (0.000). The model with revenue per employee as performance measure indicates that 15 per cent of the variation in performance is explained by supplier power, buyer power, current competition, new entry, and complementary product. The coefficient of determination (R<sup>2</sup>) is 0.233 (F = 2.669) with level of significance (0.034). The fourth model with value added as dependent variable indicates that the control variables explain 32 per cent of the variation in firm performance. The determination coefficient (R<sup>2</sup>) is 0.387 (F = 5.546) with level of significance (0.000). The last model with return on management as performance measure indicates that 25 per cent of variation in firm performance is explained by the variation of the above set of market forces. The determination coefficient (R<sup>2</sup>) is 0.326 (F = 4.247) with level of significance (0.003). Durban Watson value of all except market share is very close to 2, which indicates no sign of first order serial correlation. It is apparent that the regression model with composite performance index, ROI and VA will be good fit for analyzing influence of market forces on firm performance. However, as in the previous cases, the model with composite performance index as the performance measure is seen as the best fit for analyzing firm performance.

Separate regressions have been run to verify causal relationship between market forces and firm performance. As in the previous cases the analysis proceeded in two phases. While the first phase analysis causality between composite index as dependent variable and supplier power, buyer power, current competition, new entry and complementary product as independent variables, the second phase analyzes that of causality between individual performance indicators as dependent variables keeping the same dependent variables. Summary result of regression analyzing is given in Table 5.16.

Table 5.16 Summary Result of Regression analysis showing influence of Market forces on operational performance of firms

Models	Performance Indicators	Market Force Indicators (Standardized Coefficients)				
		Supplier Power	Buyer Power	Current Competition	New Entry	Complementary Products
1	Composite Performance Index	-0.149 (-1.505)	-0.258* (-2.994)	0.358* (3.308)	0.393* (3.454)	-0.105 (-1.188)
2	Market Share	-0.239 (-1.525)	-0.267 (-1.961)	0.239 (1.400)	0.050 (.278)	-0.109 (-.779)
3	Return on Investment	-0.339* (-2.410)	-0.026 (-0.213)	0.389* (2.540)	0.064 (.397)	-0.055 (-0.443)
4	Revenue per Employee	-0.091 (-0.554)	-0.217 (-1.530)	0.093 (0.519)	0.262 (1.401)	-0.035 (-0.241)
5	Value Added	0.023 (0.155)	-0.175 (-1.377)	-0.104 (-0.655)	0.631* (3.769)	-0.011 (-0.084)
6	Return on Management	0.007 (0.047)	-0.398* (-2.991)	-0.018 (-0.109)	0.377* (2.15)	-0.253 (-1.86)

+Values in the parentheses are t value

\* Values are significant at 5% probability level

The results of the analysis indicate that coefficients of current competition (0.358) ( $t = 3.58$ ) and new entry (0.393) ( $t = 3.454$ ) are positively significant at 5 per cent probability level which implies that there is a positive relationship between performance and current competition, and new entry. Further, the buyer power (-0.258) ( $t = 2.994$ ) is negatively significant which implies there is an inverse relationship between performance and buyer power. However, results do not give any indication regarding influence of supplier power and complementary product on performance. The properties of the estimators have also been verified prior to examining regression results of individual performance measures.

The fitted normal distribution onto a histogram of residuals gives a visual sense of adherence of residuals to the normal assumption. The histogram (Figure 5.15) and the P-P plot (Figure 5.16)

of the standardized residual suggest that the residual is probably normally distributed. Figure 5.17 is the plot for the standardized predicted variable against the standardized residuals, which indicates no sign of heteroskedasticity.

**Histogram**

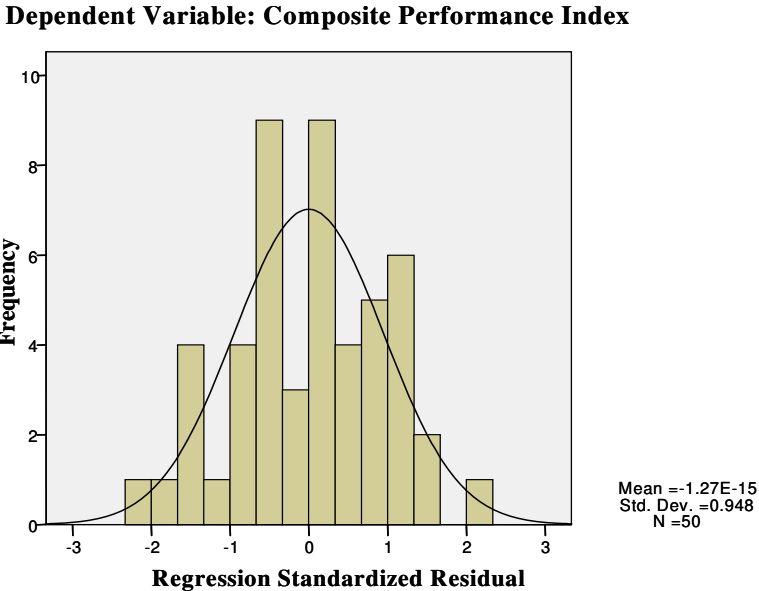


Figure 5.15 Graph of standardized residuals graph of composite performance

## Normal P-P Plot of Regression Standardized Residual

Dependent Variable: Composite Performance Index

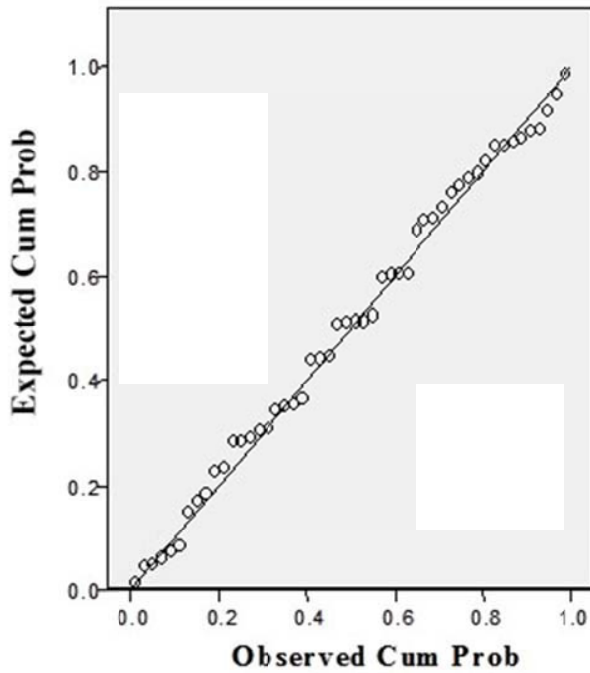


Figure 5.16 Plot of cumulative probability of composite performance

Scatter plot

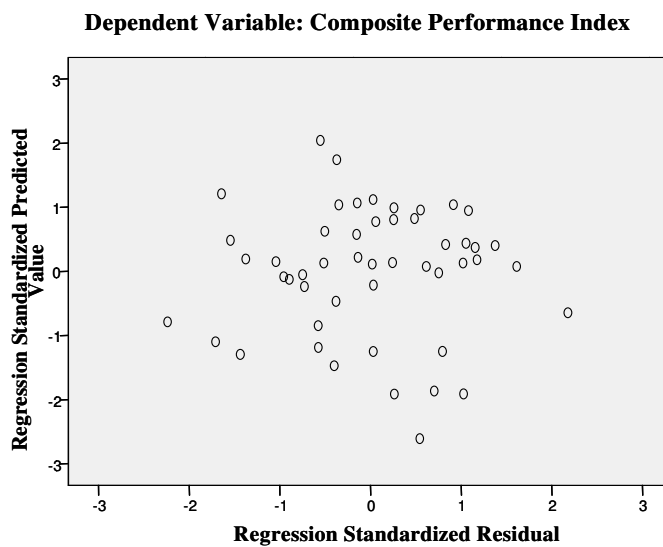


Figure 5.17 Standardized residuals plot of composite performance

The results of the regression analysis using individual performance measures are examined next. The results of the regression using Return on Investment (ROI) as performance indicator reveals that the coefficient of current competition (0.239) ( $t = 2.54$ ) is positively significant at 5 per cent probability level which implies that there is a positive relationship between performance and current competition. This result agrees with the analysis with composite performance index. Supplier power (-0.339) ( $t = -2.410$ ) is negatively significant, which implies there is an inverse relationship between performance and supplier power. The results of analysis using Market Share (MS) and Revenue per Employee (RPE) as performance measures are not good enough to make any conclusion regarding its influence on performance since the coefficients are not significant. The results of the regression using Value Added (VA) as performance measure indicate positive influence of new entry on performance (0.631) ( $t = 3.769$ ) at 5 per cent probability level, which implies increase in new entry leads to increase performance.

#### **5.4 Hypothesis Verification**

The final step of the study is to verify the hypotheses of the study. The first hypothesis is used to test the causality between firm performance and organizational and financial factors. Causal relationship between performance and operational flexibility, structural flexibility, strategic flexibility and financial flexibility on operation performance of small firms has been tested. The test has been carried out using different performance measures. In the outset, test has been carried out using composite performance index and organizational financial factors. Causality between performance and organizational and financial factors using individual performance indicators have been tested subsequently.

Organizational and financial factors will have no influence on firm performance

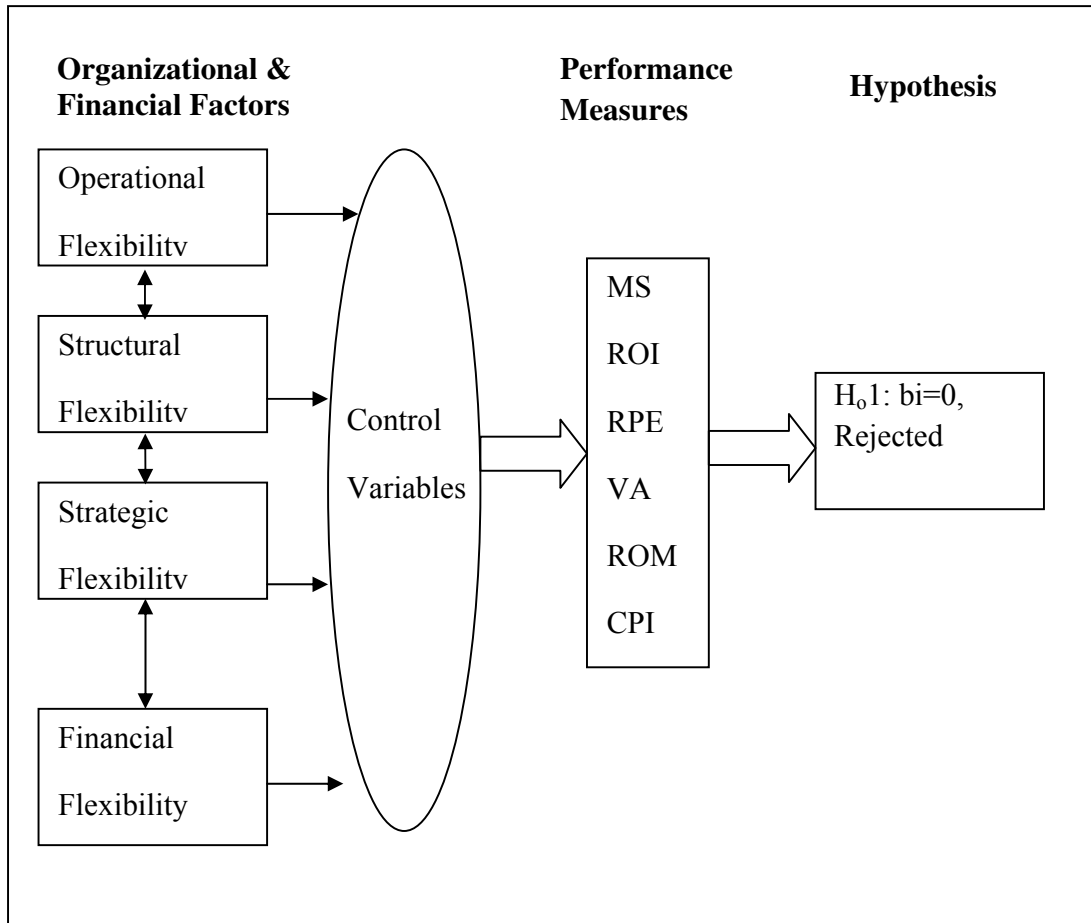


Figure 5.18 Diagrammatic representation of first hypothesis

The first hypothesis tests the causality between performance and organizational performance. The results of the test using composite performance index rejected the hypothesis that organizational and financial factors will have no impact on performance of the small firms ( $F = 12.10$ ,  $P < 0.01$ ). The test with individual performance indicators also provides almost similar results, which are given as market share ( $F = 2.48$ ,  $P = 0.057$ ), return on investment ( $F = 3.87$ ,  $P = 0.01$ ), revenue per employee ( $F = 2$ ,  $P = 0.11$ ), value added ( $F = 3.80$ ,  $P = 0.01$ ) and return on management ( $F = 2.91$ ,  $P = 0.03$ ).

The second hypothesis tests the causality between firm performance and value chain factors. The result of test using composite performance index rejected the hypothesis that value chain factors will have no influence on firm performance ( $F = 4.148$ ,  $P < 0.004$ ). The results of the tests with



individual performance indicators are, market share ( $F = 1.309$ ,  $P = 0.277$ ), return on investment ( $F = 3.908$ ,  $P = 0.005$ ), revenue per employee ( $F = 2.158$ ,  $P = 0.076$ ), value added ( $F = 1.970$ ,  $P = 0.102$ ) and return on management ( $F = 2.326$ ,  $P = 0.059$ ), not enough to draw a clear conclusion about impact of value chain factors on operation performance of the small firms.

Value chain factors have no influence on firm performance

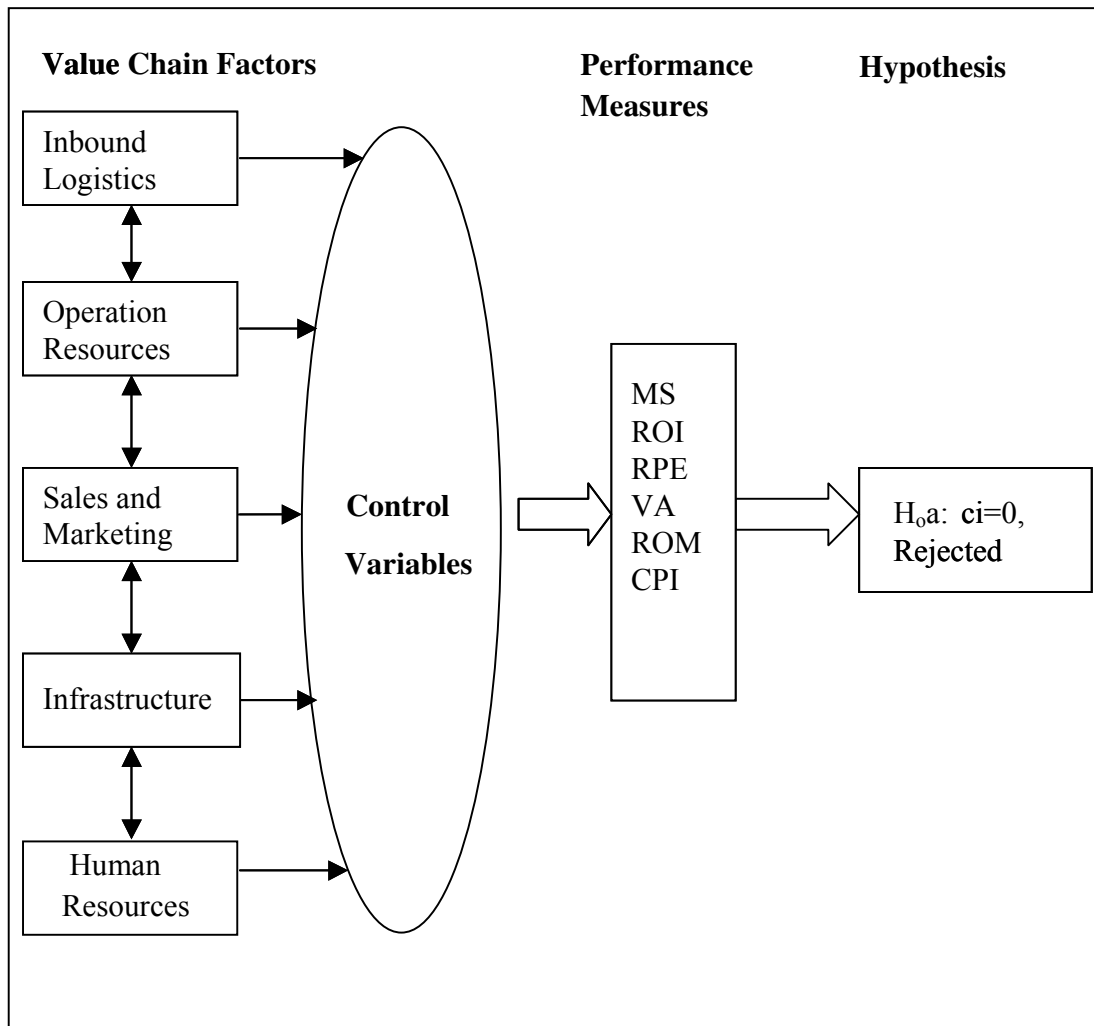


Figure 5.19 Diagrammatic representation of second hypothesis

The third hypothesis tests the causality between market forces and operational performance. The result of the test with composite index as performance indicator rejected the hypothesis that the

market forces will have no influence on firm performance ( $F = 22.254, P < 0.01$ ). The analysis with individual performance measures gives mixed results. The return on investment ( $F = 6.695, P < 0.01$ ) and value added ( $F = 5.546, P < 0.01$ ) reinforce the first finding. However, results of the tests with other three individual performance indicators are not sufficient to make any conclusion regarding influence of market forces on firm performance.

Market forces have no influence on firm performance

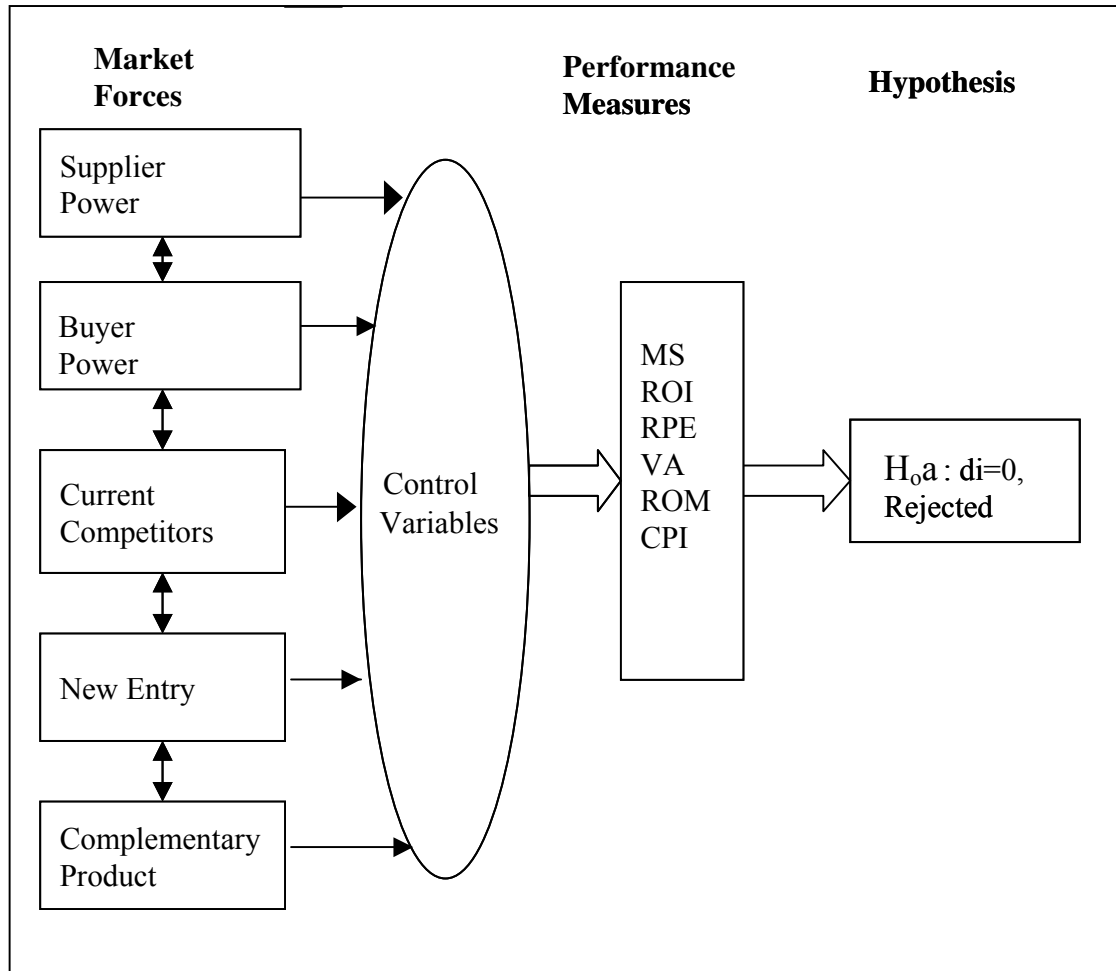


Figure 5.20 Diagrammatic representation of third hypothesis

## 5.5 Conclusion

The analysis of the data indicates that about half of the respondents belong to the category of Chief Executive officers of their firms. Further analysis regarding functional nature of the informants reveals that about 28 per cent of the respondents are working in the corporate level while others are working in the functional levels of R&D, finance, engineering, administration, manufacturing, and marketing. The detailed investigation regarding capital investments and revenue indicates that seventy four per cent of the companies are in the categories of investment less than \$10 million. Further, capital investment of the 67 per cent of the companies is less than \$15 million which generates the annually revenue of \$20 million or more. Fifty per cent of firms are with less than fifty employees. However, two per cent of the firms belong to category of the class range 401 to 499 employees. Furthermore, about ninety per cent of the small businesses are in the categories with less than two hundred employees.

The internal consistency reliability test of organizational and financial factors indicates that the reliability of operational flexibility could be improved by removing excess production capacity and outsourcing (Table 5.5). The reliability of the scale to measure structural flexibility is improved by workforce enlargement and creation of multifunctional team. The result of the scale to measure strategic flexibility consisting of four variables indicates that scale used is reliable. The result of test of financial flexibility indicates that the reliability could be improved at the standard level by removing two components from the initial analysis. The results of the test of value chain factors indicate that the scale used to measure HR is reliable (Table 5.9). The results of the test indicate that scale reliability of inbound logistics and operations could be improved by removing two components each and that of sales and marketing could be improved by removing one component. Outbound logistics, services, technical development and procurement are removed from further analysis since these variables could not achieve the conventional standard. The result of the consistency test of market forces indicates that the scale to measure complementary product is reliable and consistent (Table 5.13). The results indicate that reliability of the scale to measure supplier power and new entry could be improved at the level of conventional standard by removing one item each. The reliability of the scale of buyer power and current competition could be improved by deleting two items each. However, substitute product is removed from further analysis since the scale measure was not reliable.

Selected variables based on reliability consistency test are used for further analysis. The correlation between performance and other variables are examined first. The results of analysis of correlation, various performance measures, and organizational and financial factors indicate

strong correlation of composite performance index with strategic flexibility and financial flexibility (Table 5.6). Correlation analysis of individual performance measures also indicates almost same results; strategic flexibility and financial flexibility correlates strongly with individual performance indices viz. MS, ROI, RPE, VA and ROM. The analysis of correlation between performance measures, and value chain factors indicate strong correlation of composite performance index with operations, sales and marketing, and HR (Table 5.10). However, inbound logistics and infrastructure are not correlated strongly with performance. Result of the analysis with individual performance measures indicates multiple results. The results of the inter-correlation analysis of performance measures and market forces indicate a strong positive correlation of composite performance index with current competition and new entry (Table 5.14). However, supplier power and buyer power are negatively correlated with composite performance index. The analysis using individual performance measures does not indicate the same trend.

The analysis of correlation is a necessary condition to understand relationship between firm performance and various variables associated with organizational and financial factors, value chain factors and market forces but not a sufficient condition to assess causality of these variables, which is done with the help of regression analysis. Separate models have been developed for regression analysis. While the first model is employed to analyze the causal relationship between firm performance and organizational and financial factors, the second and third models are used for examining the causal relationship between firm performance and value chain factors, and firm performance and market forces respectively. The goodness of fit of these models has been tested before conducting detailed analysis.

The goodness of fit of model measuring causality between firm performance and organizational financial factors indicates (Table 5.7) that model with composite index as performance measure is a good fit rather than models with individual performance measures such as MS, ROI, RPE, VA, and ROM. About 32 per cent (Table 5.11) of the variations in composite performance index are explained by the value chain factors. The second attempt was to examine goodness of fit of model measuring causal relation between firm performance and value chain factors. In this case also the model with composite index as performance indicator is a good fit compared to other models with individual performance indicators. Finally, an attempt has been made to examine goodness of fit of model measuring causality between firm performance and market forces. Results indicate (Table 5.15) that about 72 per cent of the variation in firm performance is explained by the market forces, which indicates that the model with composite index as the performance measure is a good fit compared to other models with individual performance indicators.

The result of the regression analysis (Table 5.8) using composite index as performance measure indicates positive and significant influence of strategic flexibility and financial flexibility on firm performance. In other words, there is a positive relationship between performance and strategic flexibility and financial flexibility. However, influence of operation flexibility and structural flexibility on performance is not significant. The results of the further analysis with MS, ROI, and RPE as performance measures indicate positive and significant influence of financial flexibility on firm performance. However, influence of operational flexibility, structural flexibility and strategic flexibility on performance is insignificant. The result of the analysis using VA as performance measure indicates positive and significant influence of strategic flexibility on firm performance. However, result of the analysis with ROM as performance measure shows no significant influence of organizational or financial factors on firm performance.

The result of the analysis using composite index as the performance measure indicates positive and significant influence of operations resources on firm performance (Table 5.12). In other words, performance and operations are directly related. However, results show no indication regarding significant influence of inbound logistics; sales and marketing, infrastructure and human resources indicate no significant influence on performance. The results of the analysis using MS and RPE as the performance measures indicate positive and significant influence of operations resources whereas the results give no indication regarding significant influence of inbound logistics, sales and marketing, infrastructure and human resources on firm performance. The result of analysis using ROI as performance measure reveals positive and significant influence of operations resources, and sales and marketing. Further, the results of the analysis using VA and ROM as performance indicators give no sign of significant influence of value chain factors on firm performance.

The results of the analysis examining the influence of market forces on firm performance using composite index as performance measure indicate positive significant influence of current competition and new entry, and negative significant influence of the buyer power on firm performance (Table 5.16). Precisely, there is a positive relationship between performance, and current competition and new entry, which implies the firm performance increases when current competition is higher or the new entry increases. However, there is an inverse relationship between performance and buyer power, which implies firm performance decreases when buyer power increases. The results of the analysis using ROI as performance indicator reveal positively significant influence of current competition and negatively significant impact of supplier power. However, results indicate no significant influence of buyer power, new entry and complementary

product. The result of the analysis using VA as performance measure reveals positively significant impact of new entry. However, other variables indicate no significant influence on firm performance. The results of the analysis with ROM as the performance measure reveals positively significant influence of new entry and negative significant influence of buyer power on performance. However, models with MS and RPE as performance measures indicate no significant influence of the market forces variables on firm performance.

Analysis is carried for examining influence of organizational and financial factors, value chain factors and market forces on small firm performance using composite performance indices and individual performance measures. The model with composite performance index is a model fit for measuring influence of various factors on firm performance. Further, this model is more appropriate compared to other models with individual performance measures. The results of the analysis reveal that the model with composite performance index is the appropriate indicator of firm performance rather than individual performance indicators such as market share, return on investment, revenue per employee or return on management. The regression analysis using composite performance indices clearly indicates influence of various factors on performance. The influence of organizational and financial factors (positive and significant influence of strategic flexibility and financial flexibility), value chain factors (positive and significant influence of operations resources) and market forces (positive and significant influence of current competition and new entry influenced, and negative and significant influence of buyer power) on firm performance is apparent.

## Chapter 6

### Conclusion and Recommendations

Small businesses had been an integral part of American economy and culture right from the formation of the first colonies in the 16<sup>th</sup> century. They played an important role in the renewal process that pervaded American market economy by which millions, including women; minorities and immigrants enter the economic and social mainstream of American society. On the economic side, small businesses employ half of the private sector work force, produce about half of private sector output, fill niche markets, innovate and contribute to the competition in free markets. On the human side, small businesses give individuals a chance to achieve their own versions of the American dream. It provides employment opportunities to individuals and demographic groups who might otherwise be shut out of the labor market. Small businesses contribute a significant share of export and provide half of the real GDP along with their contribution to workforce. Their role in new innovation, technological inventions, early use of complex technologies, diffusion of new technologies, exploitation of international market and managerial capability is very well recognized. Precisely, American business was small business in the pre-industrial revolution age.

The purpose of this study is to analyze the operation performance of small business with special emphasis on the small telecommunication components sector in the United States by developing a research method based on the relationship between operation performance of small firms with managerial behavior, value chain factors, and market forces. The study proceeded in two phases: the first phase focused on the analysis of secondary data and the second phase on the analysis of primary data collected from the field by administering a survey. While the first phase answers the questions on potential and challenges of small businesses, the second phase examines factors influencing performance of small businesses in which attempt has been made to reveal and explain influences of each element of the above factors on operation performance of small business. While the observations regarding potential and challenges of small businesses are presented in 6.1, the major findings of the empirical analysis are summarized in Section 6.2, which is followed by the test results of hypotheses in Section 6.3. Subsequently are presented the concluding observation in Section 6.4, academic significance in Section 6.5, business significance in Section 6.6, and discussions on limitations of the study in Section 6.7. Finally, recommendations for the future research are presented in Section 6.8.

## **6.1 Potential and Challenges of Small Firms**

Studies of small business in selected developing as well as the developed countries have been reviewed to identified potentials and major challenges of small businesses. It is observed from the review that small firms played a significant role in the industrialization of the developed countries like England, Germany and Canada in general and the United States of America in particular. The potentials of small firms have been used for economic development of these countries even before industrial revolution and still they play a significant role in their economic development. The organizational flexibility and structural flexibility enable small firms to take effective strategic decisions on time, which in turn enable them to compete with their larger counterpart. These are some of the reasons for the critical inventions made by the small businesses. Small firms contributed significantly in various inventions of the twentieth century such as the airplane, fiber optic examining equipment, the heart valve, the optical scanner, the pacemaker, the personal computer, the soft contact lens and zipper. Along with these potentials small firms face various challenges especially during the period of globalization.

Small firms face certain degree of challenges from financial institutions, government policies and resource constraints. Financial constraint is the most important challenge that faces small businesses in the United States of America. Currently, this problem is more important than ever since small firms are now forced to compete with their larger counterparts in international market as well as the domestic. Generally, small firms are not able to employ skilled labor force due to the financial constraints leading to compromise to exploit the potentials of economies of scale. Regulatory policies of the government are another challenge that faces small firms. Small businesses face disproportionately higher compliance costs per employee than their larger counterparts when complying with federal regulations. The new health insurance policy and subsequent increase in premium forced small business owners to make changes to the coverage they offer to their workers, including sharing the cost of coverage with their employees, pursuing lower cost options such as consumer-driven plans, or choosing not to offer health coverage at all. Outsourcing of business activities to the less developed countries is another challenge to the small businesses in the United States of America.

## **6.2 Empirical Analysis**

The main goal of empirical analysis is to realize the influence of various factors on firm performance using primary data collected from field survey. The analysis instigated with



demographics of the respondents and reliability consistency test of the data, which is followed by the detailed empirical analysis using regression analysis. Regression analysis has been carried out using composite index and individual performance measures separately. Details of the analysis are presented in the following five separate Sections. While the results of demographics are presented in Section 6.2.1, that of internal consistency reliability is given in Section 6.2.2. The results of the analysis examining correlation between different variables with performance measures are presented in Section 6.2.3 and results of the test of goodness of model fit are given in Section 6.2.4. The main result of the analysis examining causal relationship between firm performance and market forces, value chain factors, and organizational and financial factors is given in Section 6.2.5.

### **6.2.1 Demographics**

The demographic details of the respondent revealed their capability to provide information regarding their firms. About half of the respondents were Chief Executive Officers of their firms. In the functional categories, 28 per cent of the respondents are working in the corporate level while others are working in the functional level of R&D, finance, engineering, administration, manufacturing, and marketing. Further investigation of the primary data regarding capital investments and annual revenue revealed that seventy four per cent of the companies are in the categories with investment less than \$10 million. Further, more than sixty six per cent of the companies with investment less than \$15 million make more than \$20 million yearly. Distribution of firms, according to the number of workers and revenue, revealed that fifty per cent of the companies are with less than fifty employees, whereas only two per cent of the companies fell in the range of 401 to 499 employees. Data revealed that about ninety per cent of the small businesses are in the categories with less than two hundred employees.

### **6.2.2 Results of Internal Consistency Reliability Tests**

The internal consistency reliability has been tested using Cronbach's alpha before carrying out detailed imperial analysis. In general, the higher Alpha, 0.70 or more, is the indication of the reliability test. Following the standard criteria, variables with Cronbach's alpha 0.70 or more is included in the model. Number of items in each variable has been finalized based on this condition. Cronbach's alpha will generally increase when the correlations between the items increase, which indicates the internal consistency reliability of the test. Some of the items from certain variables have been deleted so as to get stipulated Cronbach's alpha. The analysis has

been carried out for examining internal consistency reliability of organizational and financial factors, value chain factors and market forces. The summary results of the analysis are given below.

The internal consistency reliability of organizational and financial variable has been tested first. The results of the test indicate (Table 5.5) that Cronbach's alpha for operational flexibility consisted of two scale items 0.75, structural flexibility consisted of three items 0.73, strategic flexibility consisted of four items 0.71 and financial flexibility consisted of two items 0.70. The internal consistency reliability of value chain factors has been tested next. The result of the test indicates (Table 5.9) that Cronbach's alpha of inbound logistics consisted of two scale items is 0.75 and that of operations with five items, sales and marketing with three items, infrastructure with five items and human resources with five items are 0.71, 0.70, 0.71 and 0.74 respectively. The internal consistency reliability test results of market forces indicate (Table 5.13) that Cronbach's alpha for supplier power with six-scale items is 0.70 and that of buyer power with seven-scale items, current competition with nine items and new entry with 10 items are 0.71, 0.71 and 0.72 respectively.

### **6.2.3 Results of the Correlation Test**

The correlations between firm performances with different control variables have been carried out next. The correlation between organizational and financial factors with each performance measures is tested first, which is followed by the correlation analysis between performance, and value chain factors and market forces. The results of the correlation analysis of various performance measures, and organizational and financial factors indicate strong correlation of composite performance index with strategic flexibility and financial flexibility (Table 5.6). The analysis with individual performance measures also indicates almost the same results; strategic flexibility and financial flexibility correlates strongly with individual performance indices viz. MS, ROI, RPE, VA and ROM. Apparently, this is an indication of correlation between performance and organizational and financial factors. The analysis of correlation between performance measures, and value chain factors indicate strong correlation of composite performance index with operations, sales and marketing, and HR (Table 5.10). However, inbound logistics and infrastructure are not correlated strongly with performance. The result of the analysis with individual performance measures indicates multiple results. The results of the analysis of performance measures and market forces indicate a strong positive correlation of composite performance index with current competition and new entry (Table 5.14). However, supplier power and buyer power are negatively correlated with composite performance index.

The analysis using individual performance measures does not indicate the same trend. It is evident from the above analysis that value chain factors and market forces are also strongly correlated with performance. Although the correlation analysis is good enough to know the relationship between performance and other variables it is insufficient to get causal relationship between performance and these variables, which is possible with detailed regression analysis. Separate models have been developed as part of the analysis of causality, which is explained in the next section.

## **6.2.4 Test of Goodness of Model Fit**

Three models have been developed to examine the influence of various factors on firm performance. While the causality of organizational and financial factors and firm performance is tested using the first model that of value chain factors and market forces with firm performance is tested using second and third models respectively. Goodness of fit of these models has been tested before conducting detailed analysis. The goodness of fit of models measuring causality between firm performance and organizational financial factors indicates (Table 5.7) that model with composite index as performance measure is a good fit rather than models with individual performance measures such as MS, ROI, RPE, VA and ROM for measuring influence of organizational and financial factors on performance. The analysis indicates that about 48 per cent of the variations in performance are explained by the variations in organizational and financial factors.

Goodness of model fit for measuring causality performance and value chain factors model with composite index as performance indicator is a good fit compared to other models with individual performance indicators. The result indicates that about 32 per cent (Table 5.11) of the variations in composite index are explained by the value chain factors. Finally, an attempt has been made to examine goodness of fit of model measuring causality between performance and market forces. Results indicate that about 72 per cent (Table 5.15) of the variations in performance is explained by the market forces which indicate that the model with composite index as the performance measure is a good fit compared to other models with individual performance indicators. Precisely, models with composite performance index as performance indicator is a good fit for measuring influence of various factors on firm performance. Further analysis is mainly focused on this model. However, models with individual performance indicators are also performed for the continuity and comparison.

## 6.2.5 Main Results

This study attempted to answer the questions: 1. whether organizational and financial factors have any influence on operation performance of small businesses. 2. Whether the value chain factors have any impact on firm performance and 3. Whether market forces have any influence on operation performance of small firms. Detailed empirical analysis based on firm level data collected using a sample survey revealed that all these three factors have significant impact on operation performance of small business. Main results of the analysis are presented in three levels. The causality of performance and organizational factors is analyzed first, which is followed by the analysis of causality between performance and value chain factors. Finally, the relationship between performance and market forces is analyzed. The analysis has been carried out using different models. The models differ from one to another depending on indicators used for measuring firm performance. An investigation on potentials and challenges of small firms has been carried in the outset with the help of previous research on small business, which is used to develop the detailed empirical analysis.

The influence of organizational and financial factors on firm performance has been analyzed using different models. The result of the analysis using the model with composite index as the performance measure indicates positive and significant influence strategic flexibility and financial flexibility on firm performance (Table 5.8). The result indicates that the firm performance and strategic flexibility and financial flexibility are directly related. However, there is sign of influence from operation flexibility and structural flexibility on firm performance. Further analysis with models using MS, ROI and RPE as performance measures indicates positive and significant influence of financial flexibility on firm performance. However, influence of operational flexibility, structural flexibility and strategic flexibility on performance is insignificant. The result of the analysis using VA as performance measure indicates positive and significant influence of strategic flexibility on firm performance. However, the result of the analysis with ROM as performance measure shows no significant influence of organizational or financial factors on firm performance. Precisely, some of the components of organizational and financial factors influence firm performance.

The next attempt was to measure influence of value chain factors on firm performance. The result of the analysis using the model with composite index as the performance measure indicates positive and significant influence of operations resources on firm performance (Table 5.12). In other words firm performance and operations resources are directly related. However, there is no indication regarding significant influence of inbound logistics, sales and marketing,

infrastructure and human resources on performance. Further analysis with MS and RPE also indicates positively significant influence of operations resources on performance. Analysis with these models also indicates any influence of inbound logistics, sales and marketing, infrastructure and human resources on firm performance. The result of analysis using ROI as performance measure reveals positive and significant influence of operations resources, and sales and marketing. Results of the further analysis using VA and ROM as performance indicators give no sign of significant influence of value chain factors on firm performance. The above result indicates causality between firm performance and value chain factors. Finally, an attempt has been made to examine causality between firm performance and market forces. The result of the analysis using the model with composite index as the performance measure indicates positive and significant influence of current competition and new entry, and negative significant influence of the buyer power on firm performance (Table 5.16). The result indicates that firm performance related directly with current competition and new entry. Further, performance is inversely related to buyer power. The results of the analysis using ROI as performance indicator reveal positively significant influence of current competition and negatively significant impact of supplier power. However, results indicate no significant influence of buyer power, new entry and complementary product. The result of the analysis using VA as performance measure reveals positively significant impact of new entry. However, other variables indicate no significant influence on firm performance. The results of the analysis with ROM as the performance measure reveal positively significant influence of new entry and negative significant influence of buyer power on performance. However, models with MS and RPE as performance measures indicate no significant influence of the market force variables on firm performance.

### **6.3 Test Results of Hypotheses**

Based on the main objective of the study three hypotheses have been developed in the beginning of this study. The final step in this study is to verify hypotheses with the help of the empirical results. The hypotheses are tested in the order that was presented in Chapter 1.

**The analysis disproved the first hypothesis:** The first null hypothesis was that the organizational and financial factors (operational flexibility, structural flexibility, strategic flexibility) would have no significant impact on performance of small firms. The results of the analysis using the composite index as performance measures disproved the null hypothesis. Results of the analysis with individual performance indicators are also providing almost similar evidences, but not as strong as the results with the composite index.

**The analysis disproved the second hypothesis:** The second null hypothesis was that the value chain factors (inbound logistics, operation, outbound logistics, sales and marketing, service, HR, infrastructure, technology development, and procurement) would have no significant impact on performance of small firms. Results of the test with composite index as a performance indicator disproved the null hypothesis that the value chain factors have no significant influence on performance. However, results of the analysis with individual performance indicators are not providing enough evidences to draw a clear conclusion regarding impact of various value chain factors on firm performance.

**The analysis disproved the third hypothesis:** The third null hypothesis was that market forces (supplier power, buyer power, current competition, new entry, substitute product and complementary product) would have no significant impact on the performance of small firms. Results of the test using composite index disproved the null hypothesis and accepted the alternative hypothesis that these factors may have influence on firm performance. Results of the analysis with individual performance indicators are not good enough to reach the same conclusion.

## **6.4 Concluding Observations**

The main objective of the study was to examine the relationship between performance and organizational and financial factors, value chain factors and market forces. It is apparent from the above analysis that firm performance is directly related with several organizational and financial factors. The relationship between small firm performance and value chain factors is also evident from the analysis. Besides, small performance and market forces are closely related. This study empirically tested application of Porter's market forces and value chain models in analyzing influence of market forces and value chain factors on small firm performance that has been developed by Porter for analyzing influence of market forces and value chain factors on performance large business. Results of the study also indicate that composite performance index developed is a better measure than individual performance indicators.

## **6.5 Academic Significance of the Study**

The current study has academic significance for two reasons. Current study tested the application of Porter's market forces and value chain models in analyzing influence of market forces on small firm performance. Also this study used a composite performance measure to overcome

limitation of using individual performance indicators to measure firm performance. Porter's value chain and market forces models have been developed to study performance of large business. However, no serious attempt has been made in testing its relevance in analyzing small business performance. The current study empirically verified application of these models in small business and focused mainly on telecommunication components sector for identifying all value chain and market forces since the telecommunication sector is a fast growing and technology driven industry in which all these forces are evident. This study is good enough to give indications to researchers about the importance of using Porter's model in small business studies. Unlike several other studies, current study developed a composite performance measure to examine small firm performance. The performance analysis using composite performance index along with individual indicators is academically important since the current study helps the researchers to know the significant difference of these two measures.

## **6.6 Business Significance of the Study**

The current study is significant not only for the academic arena but also for small business. This study gives several indications to identify the potentials and challenges of small businesses, which enables them to develop an effective business strategy to overcome the challenges exploiting potential. Organizational and structural flexibility are identified as the potential of the small firms, which is nearly absent in their large counterpart, enables them to make timely strategic decisions. Current study further indicates the various factors influencing firm performance, which enables small firms; exploit these factors so as to increase the total performance of the firm. Precisely, identification of various factors influencing performance enables small firms more activities effectively such as inventions and innovations. As small and large firms are not mutually exclusive as far as economic development is concern, the growth of small firm influences the growth of its large counterpart. Precisely, this study is significant to explain the growth of large firms as well as small firms.

## **6.7 Limitations of the Study**

The researcher is aware of limitations and obstacles of the current study. Any research related to the private business in the United States is difficult since the private business owners are not willing to share their internal information to the outsiders due to their competition with firms with similar nature. The size of the small firm was another limitation to carry out a study in the small business sector. Small businesses are large in size. The high rate of opening and closing

phenomenon of the firm was another limitation in this sector. Hence the selection process as well as collecting data from the selected sample itself is a difficult task. The response rate of the filed survey was low (13.40% of the selected samples), which is of course one of the limitations of the study. However, the scientifically proven sampling process that is used for the study is good enough to extend the result to the entire population of small business.

## **6.8 Scope for Future Research**

Over the course of the research, there were a number of issues that were touched upon and that are of relevance to the topic studied yet entailing further elaboration to lie beyond the scope of the current study. It is worthwhile for future research to develop into such issues to gain a different perspective and a more elaborated understanding of the performance of small businesses especially small businesses in the United States. The following are some of the issues that have been identified for further research to reinforce the current study.

1. Future research needs to cover other sectors, which will enables comparison of inter-sectoral difference in performance since the current research has confined to the small telecommunication components industry of the United States.
2. The relevance of the model shall be tested comparing analyzing data from more than one country.
3. Practical application of Porter's Value Chain and Competitive Force model shall be tested simultaneously in small and large business since current study is confined to small business.



# Appendix I

**PROF. DANIEL BAIER  
CHAIR, PLANNING AND INNOVATIONS MANAGEMENT  
COTTBUS UNIVERSITY, GERMANY**



Christina R.  
Doctoral Candidate  
Cottbus University  
Germany  
Email: [CSR@yahoo.com](mailto:CSR@yahoo.com)

**Small Telecommunication Components Companies in the U.S.:**

**Performance Analysis Survey**

**An Academic Research Program**

Small companies play an important role in the U.S. economy and contribute a significant share of the national income. However, no serious attempt has gone to analyze potential, challenges and operation performance of these companies. The current research is an endeavor in this direction.

**YOUR ASSISTANCE IN THIS RESEARCH IS VALUED AND VERY MUCH APPRECIATED.**

**Please return your completed questionnaire in the enclosed pre-paid envelope to:**

Christina R.  
54 Hillcrest Drive  
Upper Saddle River, NJ 07458



Department of Innovations Management

Date

Dear

I am a doctoral candidate in Department of Planning and Innovations Management, University of Cottbus, Germany. I am writing to ask your help in an academic study for performance analysis of small telecommunication components companies in the US. This survey is part of my doctoral dissertation thesis. The primary objective of this research is to analyze the impact of market forces on performance of small companies.

Success of my study depends heavily on your response. All individual responses will remain confidential and anonymous. When you return your survey, your name and firm will be deleted from the mailing list. You will not be contacted again. All of your survey answers are treated as completely confidential. No company-specific or individual response will be disclosed.

I look forward to your response. Please return your completed questionnaire in the enclosed pre-paid envelope. Completing this questionnaire should take approximately twenty minutes of your time. I would be happy to share the research findings with you at the completion of my study, which may greatly benefit your company too. If you have any questions or comments about this study, please contact me at [CSR@yahoo.com](mailto:CSR@yahoo.com) or 201-657-8325 (Cell). Thank you very much for helping me in this effort.

Sincerely,

Christina R.  
54 Hillcrest Drive  
Upper Saddle River, NJ 07458

**E-mail:**

**Company Name:**

## Section A: Primary Information

I. Which of the following best describes your job title?

(Circle appropriate number, Questions I.-V.)

1. CEO/President
2. Director
3. Vice President
4. General Manager
5. Project Manager
6. Section /Department Head
7. CFO
8. Others-Please specify

II. Which of the following best describes your functional area?

1. Corporate
2. R&D
3. Finance
4. Engineering
5. Administration/Operation
6. Manufacturing
7. Marketing/Sales
8. Human Resources
9. Customer Service
10. Others-Please specify

III. What is the total number of Employees in your organization?

1. Less than 50
2. 51-100
3. 101-200
4. 201- 300
5. 301- 400
6. 401-499

IV. What was the approximate annual revenue of your organization in 2005?

1. Less than \$1 million
2. \$1 million to \$ 4.99 million
3. \$5 million to \$9.99 million
4. \$10 million to \$19.99 million
5. Greater than or equal to \$20 million

V. What is your approximate capital investment?

1. Less than \$5 million
2. \$5 million to \$9.99 million
3. \$10 million to \$14.99 million
4. \$15 million to \$19.99 million
5. Greater than or equal to \$20 million

## Section B: Organizational and Financial Factors

- 1. Operational Flexibility:** The following is the list of factors that may be influential to the operational flexibility of this company. Please rate the factors according to their importance. Circle the appropriate response, where 1 = strongly disagree and 5 = strongly agree

	Strongly Disagree			Strongly Agree	
Dispose an excess production capacity	1	2	3	4	5
Outsourcing	1	2	3	4	5
Use of temporary personnel	1	2	3	4	5
Selection of different suppliers	1	2	3	4	5

- 2. Structural Flexibility:** The following is the list of factors that may be influential to the structural flexibility of this company. Please rate the factors according to their importance. Circle the appropriate response, where 1 = strongly disagree and 5 = strongly agree

	Strongly Disagree			Strongly Agree	
Work force enlargement	1	2	3	4	5
Alteration of control system	1	2	3	4	5
Creation of multifunctional team	1	2	3	4	5
Conjoint manufacturing	1	2	3	4	5
Conjoint design	1	2	3	4	5

- 3. Strategic Flexibility:** The following is the list of factors that may be influential to the strategic flexibility of this company. Please rate the factors according to their importance. Circle the appropriate response, where 1 = strongly disagree and 5 = strongly agree

	Strongly Disagree			Strongly Agree	
Fast strategic change	1	2	3	4	5
Variety strategic change	1	2	3	4	5
Control of the competitors	1	2	3	4	5
Control over commercial regulations	1	2	3	4	5

4. **Financial Flexibility:** The following is the list of factors that may be influential to the financial flexibility operation of this company. Please rate the factors according to their importance. Circle the appropriate response, where 1 = strongly disagree and 5 = strongly agree

	Strongly Disagree			Strongly Agree	
The use of uncommitted resources	1	2	3	4	5
Short payback of the capital invested	1	2	3	4	5
Use of short-term contract	1	2	3	4	5
Ability to access to financial resources	1	2	3	4	5

### Section C: Value Chain Factors

1. **Inbound logistics:** The following is the list of factors that may be influential to the inbound logistics of this company. Please rate the factors according to their importance. Circle the appropriate response, where 1 = strongly disagree and 5 = strongly agree

	Strongly Disagree			Strongly Agree	
Receiving inventory	1	2	3	4	5
Receiving inspection	1	2	3	4	5
Inventory	1	2	3	4	5
Inventory distribution	1	2	3	4	5

2. **Operation:** The following is the list of factors that may be influential to the operation of this company. Please rate the factors according to their importance. Circle the appropriate response, where 1 = strongly disagree and 5 = strongly agree

	Strongly Disagree			Strongly Agree	
R & D	1	2	3	4	5
Engineering	1	2	3	4	5
Manufacturing	1	2	3	4	5
Processing	1	2	3	4	5
Workflow, processes, methodology	1	2	3	4	5
Records, documentation, publications	1	2	3	4	5

Product assurance/QA/QC inspection	1	2	3	4	5
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- 3. Outbound Logistics:** The following is the list of factors that may be influential to the outbound logistics of this company. Please rate the factors according to their importance. Circle the appropriate response, where 1 = strongly disagree and 5 = strongly agree

	Strongly Disagree			Strongly Agree	
Finished goods inventory	1	2	3	4	5
Packaging and shipping	1	2	3	4	5

- 4. Marketing and Sales:** The following is the list of factors that may be influential to the marketing and sales of this company. Please rate the factors according to their importance. Circle the appropriate response, where 1 = strongly disagree and 5 = strongly agree.

	Strongly Disagree			Strongly Agree	
Contact with customer management	1	2	3	4	5
Work presentation	1	2	3	4	5
Proposal preparation	1	2	3	4	5
Point-of sales	1	2	3	4	5

- 5. Services:** The following is the list of factors that may be influential to the services of this company. Please rate the factors according to their importance. Circle the appropriate response, where 1 = strongly disagree and 5 = strongly agree

	Strongly Disagree			Strongly Agree	
Customer support	1	2	3	4	5
Technical support	1	2	3	4	5
Repair services	1	2	3	4	5

- 6. Infrastructure:** The following is the list of factors that may be influential to the infrastructure operation of this company. Please rate the factors according to their importance. Circle the appropriate response, where 1 = strongly disagree and 5 = strongly agree.

	Strongly Disagree			Strongly Agree	
Management/executive/decisions system	1	2	3	4	5
Finance/accounting/payroll	1	2	3	4	5

Data management	1	2	3	4	5
Communications	1	2	3	4	5
Manufacturing Resources Planning System	1	2	3	4	5

7. **Human Resources:** The following is the list of factors that may be influential to the human resource operation of this company. Please rate the factors according to their importance. Circle the appropriate response, where 1 = strongly disagree and 5 = strongly agree.

	Strongly Disagree			Strongly Agree	
Hiring	1	2	3	4	5
Training	1	2	3	4	5
Compensation management	1	2	3	4	5
Benefits administration	1	2	3	4	5
Appraisals and evaluations	1	2	3	4	5

8. **Technology Development:** The following is the list of factors that may be influential to the technology development of this company. Please rate the factors according to their importance. Circle the appropriate response, where 1 = strongly disagree and 5 = strongly agree.

	Strongly Disagree			Strongly Agree	
R&D	1	2	3	4	5
Evaluation	1	2	3	4	5
Transfer/dissemination	1	2	3	4	5

9. **Procurement:** The following is the list of factors that may be influential to the procurement of this company. Please rate the factors according to their importance. Circle the appropriate response, where 1 = strongly disagree and 5 = strongly agree.

	Strongly Disagree			Strongly Agree	
Purchasing	1	2	3	4	5
Production evaluation	1	2	3	4	5
Subcontracting management	1	2	3	4	5
Outsourcing management	1	2	3	4	5

## Section D: Market Forces

1. **Supplier Power:** The following is the list of factors that may be influential to the bargaining power of your suppliers. Please rate the factors according to their importance. Circle the appropriate response, where 1 = strongly disagree and 5 = strongly agree

	Strongly Disagree		Strongly Agree		
Few suppliers dominate in this market	1	2	3	4	5
Product differentiation	1	2	3	4	5
Lack of close substitute to the product	1	2	3	4	5
Purchased volume is insignificant share of total supply	1	2	3	4	5
The product is an important input for the buyer	1	2	3	4	5
Supplier poses threat of forward integration	1	2	3	4	5
Built in switching costs	1	2	3	4	5

2. **Buyer Power:** The following is the list of factors that may be influential to the bargaining power of your buyer. Please rate the factors according to their importance. Circle the appropriate response, where 1 = strongly disagree and 5 = strongly agree.

	Strongly Disagree		Strongly Agree		
Few buyers dominate in this market	1	2	3	4	5
Undifferentiated Product	1	2	3	4	5
Close substitute for the current product	1	2	3	4	5
Purchased volume is significant share of total sales quantity	1	2	3	4	5
Buyer's low switching cost	1	2	3	4	5
Buyer's low profit margin	1	2	3	4	5
Buyer's threat of backward integration	1	2	3	4	5



Fully informed buyer	1	2	3	4	5
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Product is unimportant to buyers product/service	1	2	3	4	5
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- 3. Current Competitors:** The following is the list of factors that may be influential to defend current competitors. Please rate the factors according to their importance. Circle the appropriate response, where 1 = strongly disagree and 5 = strongly agree.

	<b>Strongly Disagree</b>			<b>Strongly Agree</b>	
Initiate a new business line	1	2	3	4	5
Product differentiation	1	2	3	4	5
Just-in-time delivery	1	2	3	4	5
Delivery lead-time	1	2	3	4	5
Capital mobilization ability	1	2	3	4	5
Price differentiation	1	2	3	4	5
Cost leadership	1	2	3	4	5
Service quality	1	2	3	4	5
Ability to exploit niche market	1	2	3	4	5
Ability to take risk to introduce new innovative products	1	2	3	4	5
Workers (employees) commitment	1	2	3	4	5

- 4. New Entry:** The following is the list of factors that may be influential to defend new entry. Please rate the factors according to their importance. Circle the appropriate response, where 1 = strongly disagree and 5 = strongly agree.

	<b>Strongly Disagree</b>			<b>Strongly Agree</b>	
Expanding existing capacity (Economies of Scale)	1	2	3	4	5
Combining multi-product lines at a single location (Economies of Scope)	1	2	3	4	5
Close substitute for the current product	1	2	3	4	5
Product differentiation	1	2	3	4	5

Capital requirement-makes it difficult for new competitors to enter market	1	2	3	4	5
High switching costs-makes it expensive for buyers to switch to new suppliers	1	2	3	4	5
Access to distribution channel	1	2	3	4	5
Patency protection defends against new competitors	1	2	3	4	5
Government procurement policy – limited to small business defends	1	2	3	4	5
Proprietary product technology	1	2	3	4	5
Cost Advantage	1	2	3	4	5

- 5. Substitute Products:** The following is the list of factors that may be influential to defend substitute products. Please rate the factors according to their importance. Circle the appropriate response, where 1 = strongly disagree and 5 = strongly agree.

	Strongly Disagree			Strongly Agree	
Product differentiation	1	2	3	4	5
Process differentiation	1	2	3	4	5
Service differentiation	1	2	3	4	5

- 6. Complementary Products:** The following is the list of factors that may be influential to defend complementary products. Please rate the factors according to their importance. Circle the appropriate response, where 1 = strongly disagree and 5 = strongly agree.

	Strongly Disagree			Strongly Agree	
Increase sales volume	1	2	3	4	5
Developing forward integration	1	2	3	4	5
Reducing competition	1	2	3	4	5

## Section E: Performance Indicators

The following are statements that relates to the performance level of your company over the last year. Please rate the factors according to their importance. Circle the appropriate response, where 1 = strongly disagree and 5 = strongly agree.

**Strongly Disagree**

**Strongly Agree**

1. Market Share (MS) increased remarkably compared to previous year (Percentage of total market held by organization)

1      2      3      4      5

2. Return on Invest (ROI) was excellent compared to previous year (Total return on investment)

1      2      3      4      5

3. Revenue per Employee (RPE) increased remarkably compared to previous year (Sales or revenue by the total employees)

1      2      3      4      5

4. Value Added (VA) increased remarkably compared to previous year (Sales less cost of material input)

1      2      3      4      5

5. Return on Management (ROM) increased remarkably compared to previous year (Revenue less costs divided by revenue)

1      2      3      4      5

**Space for Additional Comments:**

Please give your comments, if any, which are not covered by the above questions.

## Appendix II

Sl.No	A1	A2	A3	A4	A5	B1	B11	B12	B13	B14
1	3	5	5	4	3	9	3	1	2	3
2	1	5	1	2	1	11	2	3	1	5
3	1	1	1	2	1	12	2	2	5	3
4	1	1	2	1	5	11	1	4	3	3
5	6	7	1	2	1	10	2	3	4	1
6	2	7	2	1	1	10	4	2	2	2
7	1	2	1	2	1	14	2	5	4	3
8	1	1	2	3	1	8	1	1	3	3
9	1	2	1	2	1	13	3	4	3	3
10	1	1	1	3	2	14	3	5	1	5
11	4	6	5	5	5	12	3	2	4	3
12	1	1	2	3	2	5	1	1	2	1
13	1	4	1	2	3	13	3	3	3	4
14	1	1	3	4	3	16	4	3	4	5
15	1	6	2	2	1	12	4	2	3	3
16	4	6	2	3	2	9	1	2	3	3
17	1	1	2	3	2	12	2	3	3	4
18	1	1	1	2	2	9	3	2	1	3
19	1	5	1	2	1	9	3	1	1	4
20	1	3	1	1	3	16	3	5	5	3
21	1	1	3	5	1	13	2	4	3	4
22	7	3	4	5	4	13	2	3	4	4
23	1	6	1	1	2	17	4	5	3	5
24	3	4	1	2	1	16	3	5	4	4
25	1	1	1	2	1	12	2	2	4	4
26	1	3	1	2	1	10	3	3	1	3
27	1	6	1	1	1	13	4	3	2	4
28	3	7	1	2	1	15	3	4	4	4
29	1	1	2	3	1	17	2	5	5	5
30	7	3	2	3	1	10	2	2	2	4
31	1	5	1	2	1	12	5	2	2	3
32	1	1	2	4	3	16	3	5	3	5

33	2	7	3	5	3	11	3	2	2	4
34	5	4	1	2	1	12	2	3	3	4
35	3	7	1	3	1	15	4	5	4	2
36	8	4	2	4	1	13	2	3	4	4
37	3	7	3	4	1	12	2	4	3	3
38	1	2	1	2	1	14	3	3	4	4
39	1	1	1	2	4	14	2	4	5	3
40	1	4	1	1	1	20	5	5	5	5
41	8	7	3	5	5	11	3	4	2	2
42	2	7	2	5	3	11	1	4	3	3
43	1	1	2	4	2	16	3	4	5	4
44	3	4	6	1	2	12	3	3	2	4
45	2	4	4	5	2	12	2	2	4	4
46	5	7	1	5	3	16	3	5	3	5
47	3	7	2	5	2	14	3	5	2	4
48	2	4	1	2	1	14	5	4	2	3
49	8	7	3	2	1	12	4	4	1	3
50	4	7	1	2	1	12	2	3	4	3

Sl. No	B34	B4	B41	B42	B43	B44	C1	C11	C12	C13	C14	C2
1	4	15	4	4	4	3	10	3	4	2	1	32
2	3	12	3	2	3	4	9	2	1	3	3	26
3	4	16	4	4	4	4	16	3	5	5	3	31
4	1	11	3	1	2	5	13	3	2	5	3	25
5	3	12	2	4	3	3	11	2	2	4	3	29
6	4	17	4	4	4	5	14	3	3	4	4	34
7	4	18	5	4	4	5	18	5	5	5	3	30
8	1	10	2	3	2	3	20	5	5	5	5	24
9	3	16	4	3	4	5	12	3	3	2	4	28
10	2	15	4	4	3	4	17	4	4	5	4	35
11	3	16	4	4	3	5	11	3	4	2	2	28
12	3	14	1	5	3	5	8	1	5	1	1	33
13	2	15	4	4	4	3	12	2	4	3	3	26
14	3	18	4	4	5	5	15	2	4	5	4	33
15	2	14	4	4	3	3	18	5	5	4	4	31
16	1	11	5	2	1	3	12	3	4	3	2	28
17	2	14	4	4	2	4	12	4	3	3	2	32
18	3	15	4	3	3	5	14	4	4	3	3	30
19	2	12	3	3	2	4	16	4	4	4	4	27
20	1	15	5	2	5	3	15	3	4	4	4	29
21	3	15	4	3	4	4	14	4	4	3	3	31
22	2	20	5	5	5	5	13	2	2	5	4	31
23	3	15	3	3	4	5	19	5	5	5	4	29
24	2	13	3	4	3	3	12	3	4	3	2	29
25	1	15	4	2	4	5	18	4	5	5	4	33
26	5	17	4	5	3	5	15	4	3	4	4	30
27	4	14	4	3	4	3	18	5	4	4	5	30
28	4	15	3	4	4	4	15	4	3	4	4	32
29	5	15	5	3	2	5	13	5	4	2	2	24
30	2	15	4	4	3	4	13	3	3	4	3	30
31	4	14	3	3	4	4	12	4	3	3	2	32

32	3	14	3	4	4	3	14	3	3	3	5	35
33	2	15	3	3	4	5	18	4	4	5	5	31
34	4	14	4	3	3	4	18	5	5	4	4	34
35	3	12	3	3	3	3	13	4	2	4	3	27
36	3	15	4	4	3	4	15	4	5	3	3	32
37	5	13	2	4	4	3	15	3	3	5	4	31
38	4	13	4	2	3	4	13	4	3	3	3	32
39	4	14	3	3	3	5	16	4	4	4	4	31
40	3	16	5	2	4	5	13	3	3	4	3	32
41	4	13	4	3	3	3	15	4	4	4	3	23
42	3	14	4	3	3	4	14	4	3	4	3	32
43	3	14	3	4	4	3	14	3	4	3	4	31
44	4	17	4	4	4	5	18	4	5	4	5	33
45	3	12	4	3	2	3	18	4	5	4	5	28
46	5	18	5	4	4	5	17	5	3	4	5	35
47	3	16	4	4	4	4	15	4	3	4	4	31
48	2	16	5	4	3	4	15	3	5	4	3	30
49	5	17	3	4	5	5	14	4	4	3	3	34
50	4	13	3	4	3	3	14	3	4	4	3	32

Sl. No	C21	C22	C23	C24	C25	C26	C27	C3	C31	C32	C4	C41
1	4	5	5	4	4	5	5	8	4	4	20	5
2	3	3	4	4	4	4	4	5	2	3	11	3
3	5	5	5	3	4	4	5	7	2	5	19	5
4	5	5	4	2	3	3	3	6	3	3	16	5
5	3	4	4	5	5	4	4	6	3	3	12	3
6	4	5	5	5	5	5	5	8	4	4	15	4
7	4	4	5	4	5	4	4	8	4	4	15	5
8	3	4	4	4	3	3	3	6	3	3	12	5
9	4	5	4	4	4	3	4	8	4	4	16	4
10	5	5	5	5	5	5	5	9	5	4	16	5
11	5	4	4	4	4	3	4	6	4	2	15	5
12	5	5	5	5	5	5	3	8	4	4	18	4
13	3	4	4	4	3	4	4	6	3	3	12	4
14	5	5	4	4	5	5	5	9	5	4	14	4
15	3	4	5	4	5	5	5	10	5	5	19	5
16	4	4	4	4	4	4	4	7	2	5	13	4
17	4	5	5	4	4	5	5	8	4	4	12	4
18	5	5	4	4	4	4	4	9	5	4	18	5
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20	5	4	5	5	3	3	4	8	5	3	18	5
21	4	4	5	4	4	5	5	7	3	4	16	5
22	4	5	4	4	5	4	5	5	3	2	13	5
23	5	5	5	4	3	3	4	10	5	5	15	5
24	4	4	5	5	4	3	4	4	2	2	15	5
25	4	4	5	5	5	5	5	6	2	4	16	5
26	3	4	4	4	5	5	5	8	4	4	14	4
27	4	5	5	4	4	4	4	8	3	5	14	3
28	4	5	5	4	5	4	5	8	4	4	16	5
29	4	3	3	4	3	3	4	5	2	3	12	3
30	4	5	4	4	4	5	4	8	4	4	11	4
31	5	4	5	5	5	4	4	6	2	4	12	3
32	5	5	5	5	5	5	5	10	5	5	18	5



33	4	4	5	5	5	4	4	7	4	3	18	5
34	4	5	5	5	5	5	5	10	5	5	20	5
35	4	5	5	2	4	4	3	4	2	2	15	5
36	4	5	5	4	4	5	5	8	4	4	16	5
37	5	5	4	4	4	4	5	7	4	3	14	5
38	5	5	4	3	5	5	5	8	3	5	16	5
39	5	5	5	4	4	3	5	8	4	4	17	5
40	5	5	4	4	5	4	5	10	5	5	14	4
41	3	3	3	3	4	4	3	8	4	4	18	5
42	5	5	4	4	4	5	5	7	3	4	15	5
43	4	4	5	5	5	4	4	8	4	4	18	5
44	5	4	4	5	5	5	5	7	2	5	18	5
45	5	4	3	3	3	5	5	7	3	4	19	5
46	5	5	5	5	5	5	5	10	5	5	20	5
47	5	5	5	4	4	4	4	8	4	4	14	5
48	5	5	5	3	4	3	5	7	2	5	17	5
49	5	5	5	5	5	4	5	8	4	4	14	4
50	4	5	5	5	5	4	4	6	3	3	16	4

Sl No	C42	C43	C44	C5	C51	C52	C53	C6	C61	C62	C63	C64
1	5	5	5	14	5	5	4	23	5	4	5	5
2	3	3	2	7	4	2	1	17	4	4	3	3
3	4	5	5	13	5	5	3	25	5	5	5	5
4	4	3	4	11	5	5	1	21	4	5	3	5
5	3	4	2	11	4	4	3	18	5	3	4	4
6	4	4	3	10	4	4	2	18	4	3	4	4
7	4	3	3	14	5	5	4	18	3	3	4	4
8	3	3	1	11	5	5	1	19	5	4	3	3
9	4	4	4	13	4	5	4	22	4	4	5	4
10	4	4	3	14	5	5	4	21	5	4	4	4
11	4	4	2	10	4	5	1	16	4	2	4	4
12	4	5	5	15	5	5	5	25	5	5	5	5
13	3	3	2	12	5	4	3	15	4	3	2	3
14	4	4	2	12	4	4	4	22	5	4	4	5
15	5	5	4	15	5	5	5	24	5	5	5	5
16	4	2	3	10	4	4	2	16	4	2	3	4
17	2	3	3	9	4	4	1	20	4	4	4	4
18	4	5	4	13	5	5	3	24	5	5	5	5
19	4	3	3	12	5	4	3	20	4	4	4	4
20	5	5	3	11	5	5	1	21	5	5	4	4
21	4	4	3	13	5	4	4	22	4	4	5	4
22	4	3	1	10	3	5	2	19	4	3	4	3
23	5	3	2	15	5	5	5	23	5	5	4	4
24	4	5	1	13	5	3	5	18	5	3	4	2
25	5	4	2	10	5	3	2	21	4	5	4	5
26	3	3	4	15	5	5	5	19	4	5	3	4
27	4	3	4	13	5	4	4	18	4	4	3	4
28	4	3	4	12	4	4	4	19	4	4	4	4
29	4	1	4	13	4	5	4	16	5	2	4	4
30	3	3	1	11	4	4	3	19	4	3	5	4
31	4	4	1	10	3	4	3	17	2	4	3	4

32	5	5	3	15	5	5	5	23	5	3	5	5
33	4	4	5	14	5	5	4	19	5	3	3	4
34	5	5	5	15	5	5	5	20	4	4	4	4
35	3	5	2	9	3	4	2	14	4	3	2	2
36	4	4	3	15	5	5	5	19	4	4	3	5
37	4	3	2	11	5	4	2	18	4	3	4	4
38	4	3	4	14	5	5	4	19	5	4	3	4
39	5	4	3	14	5	5	4	24	5	5	4	5
40	5	4	1	15	5	5	5	17	3	4	4	4
41	4	5	4	15	5	5	5	22	4	3	5	5
42	4	3	3	13	4	5	4	17	4	3	3	4
43	4	5	4	14	4	5	5	22	5	4	4	5
44	5	5	3	15	5	5	5	23	5	5	4	4
45	5	4	5	15	5	5	5	23	5	4	4	5
46	5	5	5	15	5	5	5	25	5	5	5	5
47	4	3	2	15	5	5	5	20	4	3	4	5
48	5	5	2	13	5	5	3	19	5	5	3	4
49	4	3	3	13	5	5	3	18	3	3	4	4
50	4	4	4	15	5	5	5	25	5	5	5	5

Sl No.	C65	C7	C71	C72	C73	C74	C75	C8	C81	C82	C83	C9
1	4	20	5	5	4	4	2	12	5	4	3	15
2	3	13	3	2	2	3	3	9	3	3	3	11
3	5	25	5	5	5	5	5	15	5	5	5	11
4	4	23	5	4	5	4	5	9	4	3	2	16
5	2	17	5	5	3	2	2	11	4	4	3	15
6	3	19	3	4	4	4	4	13	5	4	4	14
7	4	20	3	5	4	4	4	13	5	4	4	13
8	4	19	4	3	4	4	4	9	3	3	3	14
9	5	18	3	3	4	4	4	12	5	3	4	17
10	4	23	5	5	5	4	4	11	4	4	3	18
11	2	22	5	4	4	4	5	14	5	5	4	15
12	5	25	5	5	5	5	5	14	4	5	5	17
13	3	16	4	3	3	3	3	13	5	3	5	14
14	4	23	5	5	4	4	5	13	5	4	4	16
15	4	23	5	5	4	4	5	10	3	3	4	13
16	3	17	4	4	3	3	3	9	4	2	3	13
17	4	15	4	2	3	4	2	10	3	3	4	11
18	4	21	5	4	4	4	4	12	5	3	4	19
19	4	20	4	5	3	4	4	9	3	3	3	13
20	3	16	5	5	2	1	3	11	4	4	3	14
21	5	19	4	5	3	3	4	13	4	4	5	16
22	5	18	4	5	4	2	3	11	4	4	3	15
23	5	20	4	5	4	3	4	14	5	5	4	20
24	4	17	5	4	3	3	2	10	4	3	3	17
25	3	21	5	4	4	4	4	12	5	4	3	18
26	3	21	4	5	4	4	4	11	3	4	4	16
27	3	18	4	5	3	3	3	12	5	4	3	15
28	3	18	4	4	4	3	3	14	5	5	4	13
29	1	17	5	4	3	2	3	9	3	4	2	14
30	3	18	4	5	3	4	2	12	4	4	4	12
31	4	17	4	4	3	3	3	11	4	4	3	15
32	5	21	3	5	4	4	5	12	5	4	3	17

33	4	13	4	3	2	2	2	12	5	4	3	14
34	4	25	5	5	5	5	5	14	4	5	5	16
35	3	14	3	3	3	3	2	10	4	3	3	12
36	3	21	4	4	5	4	4	13	5	4	4	11
37	3	20	4	5	3	4	4	12	4	3	5	14
38	3	22	5	5	4	4	4	11	4	4	3	14
39	5	20	3	5	4	4	4	11	5	3	3	16
40	2	17	3	3	4	3	4	13	5	4	4	15
41	5	21	5	4	4	4	4	9	4	3	2	15
42	3	17	4	3	3	3	4	11	5	3	3	18
43	4	21	5	5	3	4	4	13	4	4	5	17
44	5	25	5	5	5	5	5	12	4	4	4	20
45	5	23	4	5	5	4	5	12	4	4	4	14
46	5	23	5	5	4	5	4	13	4	4	5	18
47	4	18	4	4	3	3	4	14	5	5	4	17
48	2	19	4	5	3	2	5	13	5	5	3	13
49	4	19	3	4	4	4	4	14	5	5	4	15
50	5	21	5	5	4	4	3	10	4	4	2	16

SI No	C91	C92	C93	C94	D1	D11	D12	D13	D14	D15	D16	D17
1	5	4	3	3	22	2	4	2	3	4	3	4
2	3	3	3	2	25	4	3	4	5	4	2	3
3	3	5	1	2	21	3	3	3	4	3	4	1
4	3	3	5	5	25	5	5	3	2	5	1	4
5	3	4	4	4	31	4	3	5	5	5	5	4
6	4	4	3	3	22	1	4	3	3	4	4	3
7	4	4	3	2	24	2	4	5	4	5	2	2
8	5	5	3	1	31	5	1	5	5	5	5	5
9	4	5	4	4	26	4	3	4	4	4	4	3
10	5	4	4	5	22	3	4	3	3	3	3	3
11	5	4	3	3	20	2	2	3	4	3	2	4
12	5	5	5	2	19	3	3	3	3	2	2	3
13	4	4	3	3	19	3	3	2	2	4	2	3
14	4	4	4	4	20	3	3	4	3	2	2	3
15	4	4	3	2	23	3	3	4	2	5	3	3
16	4	4	3	2	34	5	5	5	5	5	4	5
17	3	4	2	2	22	4	3	4	4	3	2	2
18	5	4	5	5	23	4	4	5	2	4	2	2
19	5	4	2	2	30	5	5	4	5	5	3	3
20	4	4	3	3	23	3	5	5	1	5	1	3
21	5	4	4	3	21	2	3	3	4	4	3	2
22	4	5	3	3	23	2	2	4	4	4	2	5
23	5	5	5	5	25	3	3	5	3	5	3	3
24	4	3	5	5	22	2	3	4	5	5	1	2
25	5	4	5	4	29	5	5	5	3	5	3	3
26	5	5	3	3	22	3	3	4	2	4	3	3
27	5	4	3	3	21	3	4	3	2	4	2	3
28	3	3	3	4	18	3	3	3	3	2	2	2
29	4	4	3	3	27	2	3	3	4	4	4	3
30	4	4	2	2	24	4	3	4	5	4	1	3
31	4	3	4	4	22	4	4	4	3	2	2	3
32	4	5	4	4	18	2	3	3	3	2	2	3

33	4	3	4	3	23	4	5	4	2	4	2	2
34	5	5	3	3	24	2	3	4	4	5	3	3
35	3	2	3	4	32	5	4	5	5	4	4	5
36	3	2	3	3	27	3	4	5	3	5	4	3
37	2	3	4	5	22	4	3	2	3	4	3	3
38	4	4	3	3	21	3	3	3	3	3	3	3
39	3	5	4	4	20	1	2	4	4	4	3	2
40	3	4	4	4	21	3	3	3	3	3	3	3
41	4	4	3	4	27	3	4	4	5	4	2	5
42	5	5	4	4	29	4	4	4	5	5	4	3
43	5	4	3	5	25	4	5	4	3	3	3	3
44	5	5	5	5	19	3	3	3	3	3	2	2
45	4	4	3	3	30	5	4	5	5	4	3	4
46	5	5	4	4	21	3	2	3	3	3	4	3
47	5	3	4	5	23	4	3	4	2	4	2	4
48	5	4	2	2	24	4	4	4	2	4	4	2
49	3	4	4	4	25	4	4	3	4	4	3	3
50	4	4	5	3	23	4	4	4	2	3	3	3

SI No.	D2	D21	D22	D23	D24	D25	D26	D27	D28	D29	D3	D31
1	26	2	3	3	3	3	3	3	5	1	42	3
2	31	3	4	4	4	3	3	3	4	3	35	3
3	15	5	1	1	1	1	1	1	3	1	48	4
4	25	3	3	2	2	3	3	3	3	3	34	2
5	34	4	5	3	4	3	4	3	5	3	36	1
6	27	1	4	3	3	4	3	4	3	2	41	4
7	24	4	4	2	3	2	2	2	4	1	45	5
8	25	4	3	3	2	3	1	3	3	3	29	1
9	23	2	2	3	4	2	2	3	2	3	44	5
10	32	3	5	5	3	4	3	3	3	3	45	4
11	24	3	2	2	4	1	1	5	5	1	49	4
12	22	2	2	3	3	2	2	2	3	3	46	5
13	25	3	3	3	4	3	2	2	3	2	47	3
14	25	3	3	4	2	2	2	3	4	2	44	4
15	32	4	4	4	4	3	4	3	5	1	47	4
16	37	5	4	4	4	4	4	4	4	4	37	2
17	31	3	3	4	3	4	4	2	4	4	43	5
18	26	3	2	2	3	4	3	3	4	2	42	4
19	31	4	3	3	4	3	4	3	5	2	39	3
20	23	2	2	1	5	5	1	1	5	1	41	2
21	21	3	3	2	2	2	3	2	2	2	43	3
22	20	2	1	3	3	1	2	2	5	1	45	4
23	32	4	3	3	4	3	4	3	4	4	44	4
24	35	4	4	4	5	3	4	4	4	3	38	4
25	25	5	2	4	2	2	2	2	5	1	45	3
26	27	4	3	3	3	3	3	2	4	2	41	3
27	24	2	3	3	4	2	2	3	3	2	43	4
28	24	2	2	2	2	2	2	2	3	4	49	5
29	29	2	4	4	4	4	3	3	4	1	38	3
30	22	5	2	1	4	1	3	1	4	1	42	4
31	26	4	3	2	4	3	1	3	2	4	39	3
32	25	4	2	3	4	2	2	3	4	1	46	5



33	27	3	3	4	4	3	2	3	3	2	41	3
34	22	2	2	2	3	2	3	2	5	1	43	4
35	29	3	3	3	3	3	3	4	4	3	38	5
36	26	3	3	4	3	2	2	2	4	3	45	3
37	26	4	3	3	2	3	3	3	4	1	35	2
38	28	4	3	4	3	3	3	2	4	2	33	3
39	21	4	1	2	2	3	1	4	3	1	36	3
40	19	3	2	2	2	2	2	2	2	2	40	4
41	24	4	3	3	2	3	2	2	2	3	33	3
42	23	4	2	4	2	2	2	3	2	2	41	4
43	26	3	2	3	4	4	3	2	3	2	47	4
44	27	3	3	3	3	4	3	2	4	2	44	3
45	29	4	2	3	2	4	4	3	4	3	35	2
46	21	3	3	3	4	3	1	3	1	1	45	4
47	20	1	2	2	2	3	3	2	3	2	42	4
48	24	4	3	4	3	2	2	2	3	1	47	4
49	22	3	3	3	3	3	2	2	1	2	48	5
50	22	4	4	2	2	2	2	2	2	2	38	3

Sl No.	D32	D33	D34	D35	D36	D37	D38	D39	D310	D311	D4	D41
1	5	4	4	2	5	3	4	4	3	5	37	3
2	2	3	4	2	4	3	4	4	3	3	24	3
3	4	3	4	5	5	3	5	5	5	5	36	3
4	4	1	2	1	2	3	4	5	5	5	31	3
5	3	2	4	3	3	4	4	5	3	4	23	3
6	5	3	4	3	3	3	3	5	4	4	42	4
7	5	4	5	3	3	3	5	5	3	4	39	4
8	1	4	4	2	3	3	4	1	1	5	28	3
9	4	4	4	4	4	4	3	4	4	4	41	3
10	4	4	5	3	5	5	4	4	4	3	39	4
11	4	4	5	4	4	4	5	5	5	5	40	3
12	5	4	4	3	3	3	5	5	4	5	41	5
13	4	4	5	4	4	3	5	5	5	5	38	4
14	4	4	4	3	3	5	4	4	4	5	43	4
15	4	4	5	4	4	5	4	5	4	4	37	5
16	4	3	4	2	3	3	4	5	3	4	30	3
17	5	4	5	4	4	4	4	4	4	2	33	3
18	4	4	4	4	2	3	4	4	4	5	32	2
19	3	4	4	3	3	2	4	5	3	5	31	4
20	3	4	4	4	3	3	4	5	4	5	32	2
21	5	4	4	3	4	3	4	5	4	4	42	4
22	5	4	4	3	5	4	2	5	5	4	35	2
23	4	4	4	4	3	4	4	4	4	5	44	4
24	4	3	3	3	2	2	5	4	4	4	31	3
25	4	5	5	4	2	2	5	5	5	5	37	3
26	3	4	4	3	4	4	4	4	3	5	36	3
27	3	4	4	4	4	3	5	2	5	5	36	3
28	5	4	4	4	4	4	5	5	5	4	45	4
29	3	3	5	2	4	4	4	4	4	2	30	3
30	4	3	3	4	3	4	4	5	4	4	34	2
31	4	3	3	4	4	4	3	4	4	3	30	1
32	4	3	3	4	4	5	4	5	5	4	47	4

33	5	3	4	3	2	3	4	5	4	5	35	3
34	4	4	4	3	3	3	4	4	5	5	43	4
35	4	1	2	2	4	3	3	5	5	4	27	2
36	5	4	5	3	4	4	5	4	3	5	40	5
37	3	4	5	3	3	3	3	4	2	3	31	4
38	5	1	1	1	3	1	5	4	4	5	35	1
39	3	3	3	3	2	4	4	4	4	3	33	3
40	5	1	1	3	3	3	5	5	5	5	34	4
41	2	3	4	3	2	3	4	3	3	3	29	3
42	4	3	3	4	4	3	4	4	4	4	33	3
43	5	3	4	3	4	5	5	5	4	5	36	2
44	4	5	5	4	2	3	5	5	4	4	33	3
45	3	3	4	4	2	3	4	4	3	3	36	2
46	4	4	4	5	3	4	4	4	4	5	34	3
47	4	3	4	4	3	4	4	4	4	4	37	4
48	5	4	4	5	4	3	4	5	5	4	39	4
49	4	4	5	4	5	4	5	4	4	4	40	3
50	3	3	3	5	4	3	3	3	4	4	36	3

Sl No.	D42	D43	D44	D45	D46	D47	D48	D49	D410	D411	D5	D51
1	4	3	5	3	2	2	2	5	4	4	12	4
2	3	3	2	4	2	3	1	1	1	1	8	2
3	5	3	5	5	2	1	1	3	3	5	11	5
4	2	1	4	4	5	3	2	1	4	2	5	2
5	3	2	2	4	1	2	1	2	1	2	6	1
6	4	3	4	4	4	4	4	3	4	4	12	3
7	3	3	4	3	4	4	3	3	4	4	11	3
8	2	2	2	4	5	2	2	2	2	2	9	3
9	3	4	3	5	4	4	5	3	3	4	13	4
10	4	4	4	2	2	4	3	3	4	5	11	4
11	3	3	3	4	5	3	5	2	5	4	15	5
12	5	3	4	5	1	3	4	3	5	3	13	4
13	3	3	4	3	4	3	3	3	4	4	12	4
14	4	4	5	3	4	4	4	3	4	4	12	5
15	4	3	4	3	3	3	1	2	4	5	13	4
16	2	2	3	4	3	2	2	2	4	3	12	4
17	4	4	4	3	1	3	1	3	3	4	10	4
18	2	2	3	3	4	4	3	2	4	3	13	5
19	3	3	2	4	3	3	2	2	2	3	9	1
20	2	1	3	3	3	3	4	4	3	4	13	5
21	3	4	5	3	4	4	4	3	4	4	13	5
22	2	4	4	2	5	2	3	2	4	5	10	2
23	4	4	4	4	4	4	4	4	4	4	9	3
24	3	3	4	1	4	3	1	3	4	2	13	5
25	4	3	4	4	3	3	1	4	4	4	9	3
26	4	2	3	3	4	4	3	3	3	4	9	3
27	3	3	3	3	3	3	3	4	4	4	11	4
28	4	4	4	4	4	4	5	4	4	4	14	5
29	3	3	3	3	3	3	2	2	2	3	10	4
30	3	2	3	5	5	3	2	2	4	3	12	4
31	2	2	4	3	4	5	2	2	3	2	10	4
32	4	3	4	4	4	5	5	4	5	5	9	5

33	4	3	4	3	3	2	3	3	3	4	8	4
34	4	4	4	3	3	4	3	4	5	5	11	4
35	2	3	3	2	2	1	4	3	3	2	6	3
36	4	4	5	3	3	3	3	1	5	4	14	4
37	4	3	3	2	2	4	2	2	2	3	10	3
38	3	3	5	5	4	4	4	1	4	1	11	5
39	4	4	4	1	3	1	4	1	4	4	10	3
40	3	3	3	3	3	3	3	3	3	3	11	5
41	3	3	3	3	2	2	2	3	3	2	12	4
42	2	4	4	2	4	2	4	4	2	2	11	5
43	2	3	4	3	4	4	3	3	4	4	15	5
44	3	4	4	3	3	3	2	2	3	3	9	3
45	2	4	4	4	4	4	3	2	4	3	13	4
46	4	4	4	3	2	3	4	1	3	3	15	5
47	2	2	4	3	3	4	2	4	5	4	12	5
48	4	3	5	4	3	3	3	3	4	3	11	4
49	4	4	3	4	4	3	4	4	4	3	9	3
50	3	3	3	3	3	3	3	4	4	4	9	3

SI No	D52	D53	D6	D61	D62	D63	E1	E2	E3	E4	E5	E
1	4	4	10	3	2	5	4	4	4	3	2	3.47
2	2	4	7	3	2	2	3	3	3	2	3	2.73
3	1	5	15	5	5	5	4	3	3	4	4	3.73
4	1	2	10	3	5	2	4	3	3	4	4	2.41
5	1	4	11	3	3	5	3	2	3	2	2	2.40
6	4	5	11	4	3	4	4	4	3	4	3	3.80
7	3	5	6	2	2	2	3	5	5	4	4	3.94
8	3	3	3	1	1	1	3	1	3	3	3	2.60
9	5	4	13	5	4	4	3	3	3	4	4	3.40
10	4	3	12	4	4	4	3	3	4	3	3	3.07
11	5	5	15	5	5	5	3	4	4	4	4	3.67
12	4	5	13	5	5	3	4	5	4	3	3	3.80
13	3	5	12	4	4	4	4	4	4	3	3	3.60
14	3	4	11	4	4	3	4	3	3	4	3	3.60
15	4	5	12	4	4	4	3	4	3	3	3	3.20
16	4	4	9	3	3	3	3	2	3	3	3	2.80
17	2	4	10	4	2	4	3	4	3	3	2	3.07
18	3	5	14	4	5	5	3	3	3	3	3	3.00
19	4	4	9	3	3	3	3	2	3	2	2	2.40
20	5	3	10	4	3	3	3	4	3	3	4	3.00
21	4	4	11	3	4	4	3	4	3	3	4	3.33
22	5	3	6	2	2	2	4	4	3	3	4	3.66
23	3	3	9	3	3	3	3	3	4	4	4	3.47
24	3	5	13	5	5	3	3	3	2	3	2	2.80
25	2	4	11	4	3	4	3	4	4	3	4	3.40
26	3	3	11	4	3	4	2	4	4	3	4	3.07
27	3	4	11	4	3	4	4	3	3	3	3	3.33
28	4	5	12	4	4	4	5	3	5	3	4	3.94
29	2	4	6	2	2	2	3	2	1	2	3	2.39
30	4	4	10	2	4	4	4	3	3	3	3	3.33
31	3	3	11	3	4	4	4	4	4	2	2	3.21
32	2	2	10	4	4	2	4	4	4	4	3	3.87

33	2	2	6	2	2	2	4	4	4	3	4	3.73
34	4	3	11	3	4	4	4	4	4	3	4	3.73
35	1	2	11	4	4	3	3	3	3	2	2	2.60
36	5	5	13	4	5	4	4	5	3	3	3	3.73
37	3	4	10	4	3	3	3	4	3	4	4	3.60
38	1	5	12	4	4	4	3	3	3	3	3	3.00
39	3	4	13	5	4	4	3	3	3	3	3	3.00
40	3	3	15	5	5	5	4	3	5	3	3	3.47
41	4	4	12	4	4	4	2	3	3	3	3	2.67
42	3	3	11	4	3	4	3	3	3	3	3	3.00
43	5	5	10	3	3	4	4	4	3	3	4	3.66
44	3	3	9	3	3	3	4	4	4	3	3	3.60
45	4	5	9	3	3	3	3	2	3	3	3	2.80
46	5	5	15	5	5	5	4	4	4	3	3	3.66
47	3	4	12	4	4	4	4	4	4	3	4	3.73
48	4	3	9	3	4	2	3	5	4	4	3	3.74
49	3	3	12	4	4	4	5	3	3	4	3	3.93
50	3	3	12	4	5	3	3	3	3	3	3	3.00

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